



National Pollutant Discharge Elimination System (NPDES)

New Development & Redevelopment Guidelines for Projects Under the March Joint Powers Authority

January 9, 2008



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1.0 INTRODUCTION

The purpose of this document is to provide the March Joint Powers Authority (MJPA) with guidance procedures and a format to implement the regional National Pollutant Discharge Elimination System (NPDES) land development requirements. This document meets the intent of the "California Regional Water Quality Control Board, Santa Ana Region (Order No. R8-2002-0011, NPDES No. CAS 618033), Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Incorporated Cities of Riverside County within the Santa Ana Region Areawide Urban Runoff" (The Riverside County MS4 Permit). This 2002 Permit is currently implemented throughout western Riverside County. However, as a small local government with a population of less than 100,000, March JPA is primarily a redevelopment agency charged with the redevelopment of the former March Air Force Base. March JPA is not a Co-Permittee of, and is not subject to, the Riverside County MS4 Permit.

This document is to be used by March JPA as a guidance document to help establish consistency with other agencies (i.e. USEPA, US Fish & Wildlife Services, Santa Ana Regional Water Quality Control Board (SARWQCB), County of Riverside) that all help protect natural resources. The objective in preparing this document includes:

- Provide general information on the regional regulations;
- Provide Water Quality Management Plan (WQMP) submittal requirements;
- Provide Design Guidelines for Best Management Practices;
- Provide Storm Water Pollution Prevention Plan (SWPPP) submittal requirements and guidelines;
- Provide MJPA submittal and approval process.

MJPA History

March AFB was first established as a military installation in 1918 which encompassed 6,500-acres of land. March AFB is located within the western Riverside County region of Southern California. The March AFB Planning area is bisected by Interstate 215 (old Highway 395), approximately 3-miles south of State Highway 60. The surrounding communities include Moreno Valley, Perris, Riverside and unincorporated areas of Riverside County. In July of 1993, March AFB was realigned and converted from an active duty to an air reserve base. March Joint Powers Authority (JPA) is the local public entity created to address the reuse, redevelopment and joint use of approximately 4,400-acres of excess federal land formerly located within March AFB. In 1997, the County of Riverside transferred local land use authority to March JPA pursuant to a legislative declaration by the state legislature. As a local government, March JPA subsequently prepared and adopted the March Joint Powers Authority General Plan in 1999.



In order to implement the policies of the General Plan, the March JPA approved the following ordinances and codes:

- 1) March JPA Development Code
- 2) Subdivision Ordinance
- 3) Building and Construction Code

These codes include provisions for land use, zoning, development standards, subdivision requirements, and the adoption of the latest edition of the uniform codes relative to building, housing, fire, electrical, mechanical, signs, dangerous buildings and related appendices. In accordance with these approvals, the March JPA will grant all future land use entitlements and building permits. March JPA has streamlined the development process with March JPA having land use authority, granting land use entitlements, and issuing building permits. Business and development opportunities are conducted by "one" cohesive agency. As stated in the March JPA General Plan Resource Management Section (Water Resources) provision 1.8 states, "Assure that development projects comply with regulatory agency requirements, including Federal, State and Regional regulations."

Although not a Riverside County MS4 Permit Co-Permittee, the JPA has the legal authority and responsibility to implement the NPDES land development regulations.

2.0 BACKGROUND

MJPA General Plan

The March Joint Powers Authority General Plan is a long-range comprehensive plan designed to outline and delineate the land uses and development of approximately 4,400-acres of land known formerly as March AFB. The March JPA General Plan was designed to implement the March Air Base Master Reuse Plan which included the disposal and redevelopment of March AFB lands. The General Plan serves to link community values to actual physical decisions.

The General plan identifies the community's land use, circulation, environmental, economic, and social goals and policies as they relate to land use and development. The General Plan defines reuse and development opportunities of the planning area, while preserving the environmental quality. The land use designations for the planning area include: Commercial, Industrial, Office, Mixed-use, Recreational/Open Space, etc.

Clean Water Act

In 1987 Congress amended the Federal Clean Water Act to require the permitting of stormwater discharges from municipal storm drain systems. The USEPA promulgated



regulations in 1990 to enact the new law. In the regulations (and the preceding draft regulations), USEPA listed the County of Riverside as a County that must obtain an NPDES permit. The Regional Water Quality Control Boards (RWQCB) enforces the USEPA regulations and the Clean Water Act (Porter Cologne) in California. There are three RWQCBs in Riverside County that have jurisdictional oversight based on the MS4 Permits for the Cities, Riverside County and Riverside County Flood Control and Water Conservation District. Noting the jurisdictional areas are based on watersheds, the Santa Ana Regional Board, San Diego Regional Board, and Colorado Regional Board manage western, southern and eastern Riverside County, respectively. The MJPA area is located within the Santa Ana River Watershed (Santa Ana Regional Water Quality Control Board - SARWQCB).

The National Pollutant Discharge Elimination System (NPDES) permits require the permittees to control the discharge of pollutants to the Waters of the United States by the implementation of Best Management Practices (BMPs). In general, BMPs are required on a wide variety of land uses. BMPs should also be required on secondary uses of concern (such as outdoor material/equipment storage, vehicle/ equipment fueling and service) and certain low intensity, but potentially high polluting uses (such as golf courses and plant nurseries). For projects with unique water quality issues, additional applicable solutions may be required on a case by case basis.

Approval and Enforcement Authority

The March JPA maintains planning and construction approval authority within its jurisdictional boundaries. Through the implementation of the development code and ordinances, the JPA is authorized to mandate development design elements in order to meet the intent of various building safety, environmental and public safety requirements. The March JPA has chosen to meet the intent of the Riverside County MS4 Permit concerning development goals.

The SARWQCB manages the approval and enforcement authority for the entire Santa Ana River Watershed. This watershed includes the San Jacinto River sub-watershed into which the majority of JPA area discharges into, as well as the Santa Ana River Watershed, which a small portion of the JPA discharges into. The Porter Cologne Act authorizes the SARWQCB to approve, monitor and enforce the Riverside County MS4 Permit and the following general State-wide permits:

- NPDES General Construction Storm water Permit (Order No. 99-08-DWQ, CAS000002);
- NPDES General Industrial Activities Permit (Order No. 97-03-DWQ, CAS000001).

An industrial or commercial project approved within the March JPA jurisdictional area, will need to meet the intent of these three permits. A residential project would need to



meet the intent of both the Riverside MS4 Permit and the General Construction permit. All construction projects, within the State of California, that meet the Construction Permit criteria, must have the required documents. All industrial/ commercial sites, within the State of California, that meet the Industrial Permit criteria, also must have the required documents. Information on these two permits is included as appendices to this document and may also be found on the State of California Water Resources Control Board's web page.

Enforcement

The March JPA has the authority to ministerially withhold certificates or permits if BMPs or specifically designed features needed to properly manage potential pollutants are not implemented into a completed project.

The Santa Ana Regional Water Quality Control Board has the authority to inspect and enforce all three permit regulations at any location within their jurisdiction. The SARWQCB may impose additional requirements on a site-specific basis, depending on the situation. The SARWQCB has the authority to fine fees and administrate liability suits against permitted and non-permitted locations and owners.



3.0 DEVELOPMENT & PLANNING PROCESS

Storm water quality management should be considered during a project's planning phase, implemented during the construction phase of the project and ultimately maintained during the life of the project. Through the planning process "standard conditions of approval" help to address the discharge of potential pollutants that may enter into the drainage system that are generated by certain types of land uses.

On September 15, 1999, the JPA adopted a General Plan for the development and redevelopment of 4,400-acres. The JPA has also adopted an Environmental Impact Report (EIR) for the redevelopment project area. Both of these documents are available through the JPA.

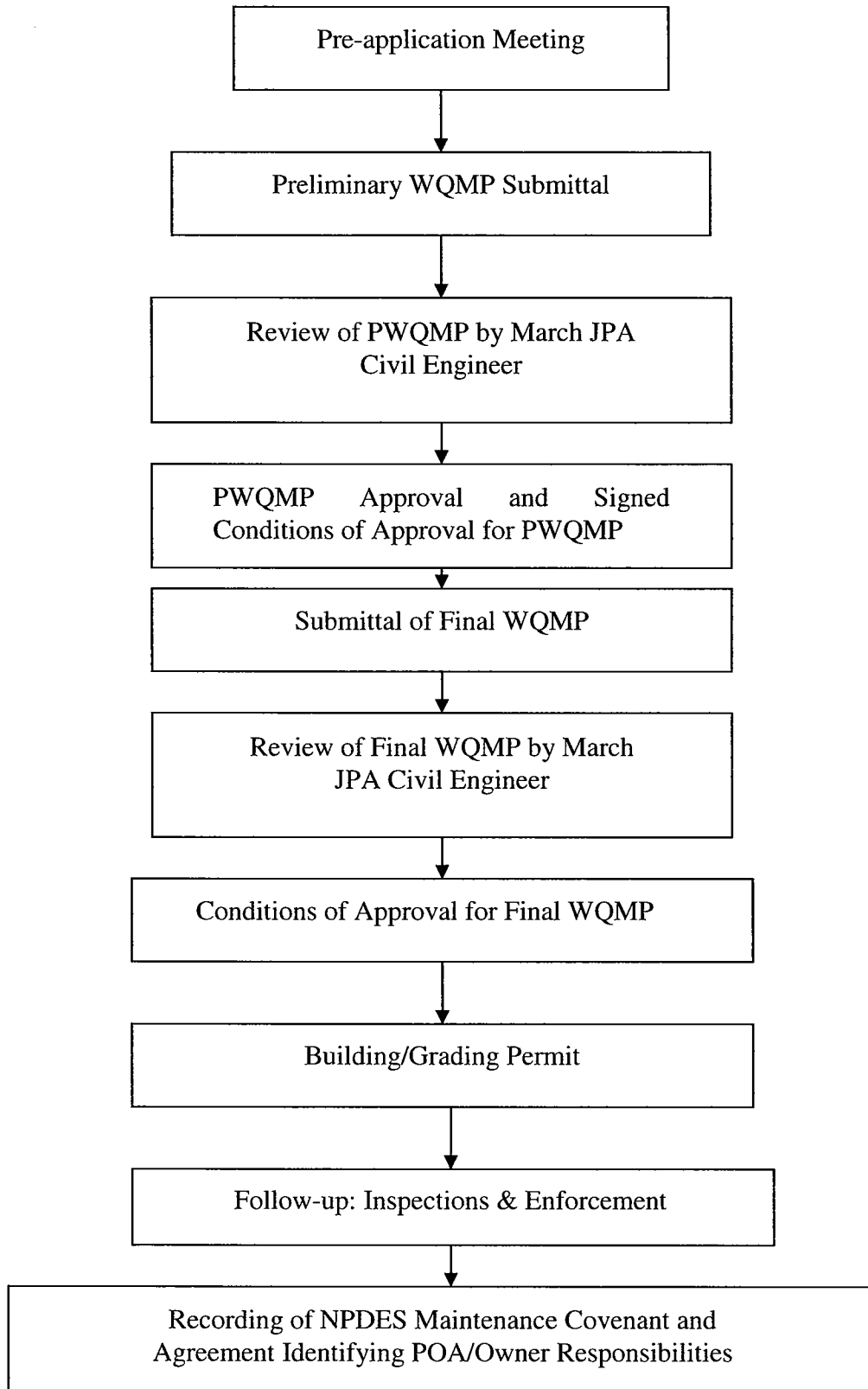
Planning review procedures shall be adopted and uniformly implemented by the JPA to ensure consistency with other agency requirements. The JPA planning process is outlined as follows:

1. The present procedure for approval of grading, building, and similar permits will be modified to include incorporation of the BMPs listed in WQMP template.
2. The JPA will make this Guidance document detailing implementation of BMPs available to development applicants through the permitting/land development process. Applicants will be informed at the earliest possible point of processing of these requirements.
3. The JPA will develop implementation procedures for the new development BMP guidelines, including training and education for the employees that will implement this Guidance document.
4. Implementing staff will notify applicant at the earliest possible opportunity if there is a known water quality problem which might affect the proposed development. The permitting/development review process will verify that plans contain all the applicable BMPs. Compliance is intended to be a matter of incorporating the measures specified in this Guidance document or other acceptable standard into the plans and submittals currently required by the JPA, and the review process will effectively be verification that these are included.

The following pages present flow charts presenting both the applicant's submittal process and the JPA's internal submittal and review process specific to WQMP document approvals.

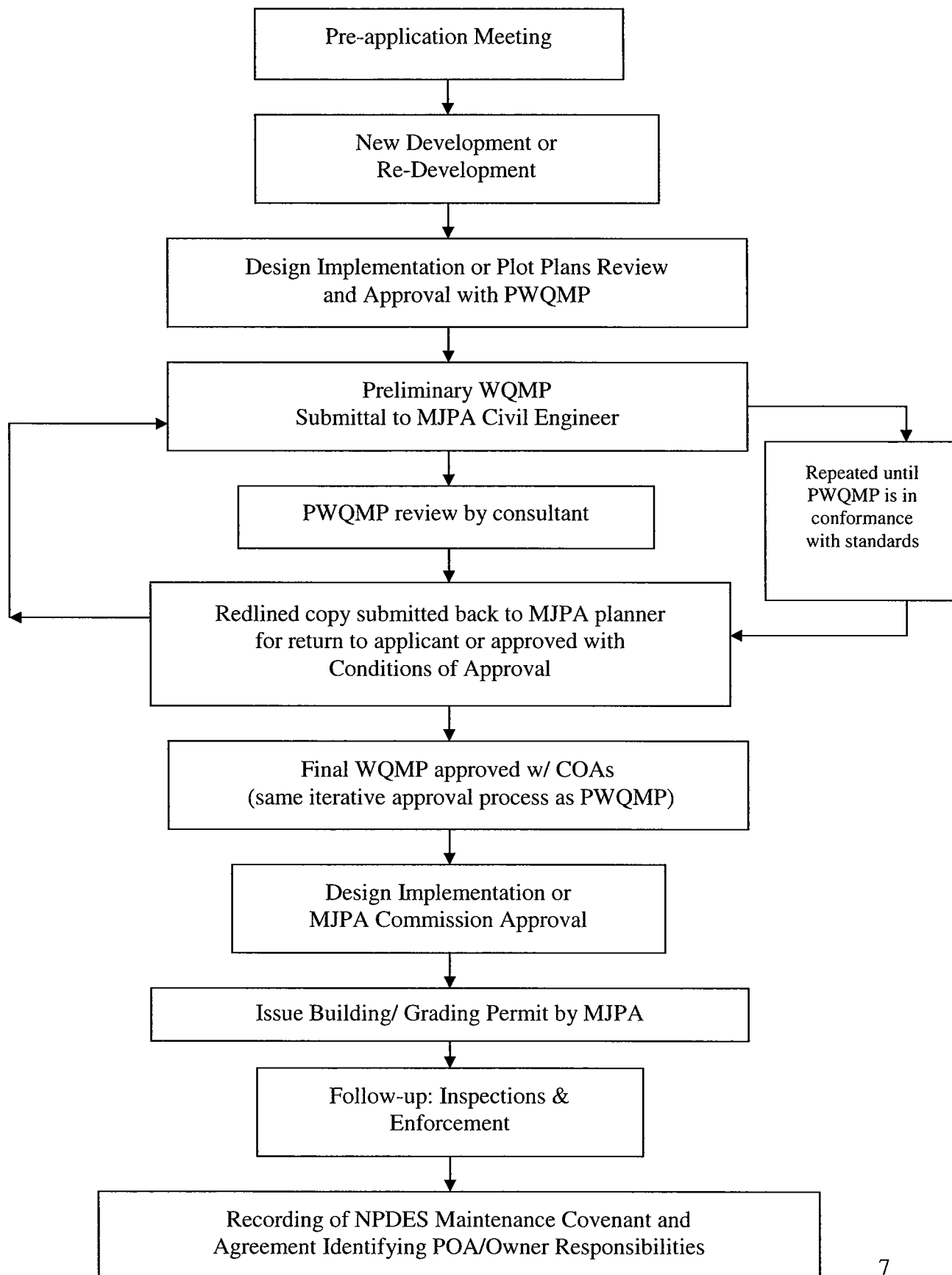


APPLICANT'S SUBMITTAL PROCESS





MJPA INTERNAL PROCESS





4.0 PROJECTS REQUIRING A PROJECT-SPECIFIC WQMP

Each Water Board throughout California has developed watershed specific land development guidelines and project sizing thresholds. For the Santa Ana River Watershed, the Riverside County MS4 Permit specifies the types of development that require the preparation, approval, and implementation of a project-specific WQMP. Although March JPA is not subject to the MS4 Permit, the JPA intends to enforce the objectives of the MS4 Permit through the requirements of the WQMPs. Those types of development are Significant Redevelopment and New Development (individually "Project" or collectively "Projects") represented by a map or permit for which discretionary approval is sought from the JPA. However, the JPA may require development of a WQMP for any project.

New Development

New Development is defined in the Santa Ana Region to include:

1. Residential development of 10 dwelling units or more, including single family and multi-family dwelling units, condominiums, or apartments.
2. Industrial and commercial development where the land area represented by the proposed map or permit is 100,000 square feet or more, including, but not limited to, non-residential developments such as hospitals, educational institutions, recreational facilities, mini-malls, hotels, office buildings, warehouses, light industrial, and heavy industrial facilities.
3. Automotive repair shops [Standard Industrial Classification (SIC) codes: 5013, 7532, 7533, 7534, 7537, 7538, and 7539].
4. Restaurants (SIC code 5812) where the project site is 5,000 square feet or more.
5. Hillside development that creates 10,000 square feet or more, of impervious surface(s) including developments in areas with known erosive soil conditions or where natural slope is 25 percent or more.
6. Developments creating 2,500 square feet or more of impervious surface that is adjacent to (within 200 feet) or discharging directly into areas designated in the Basin Plan as waters supporting habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law are rare, threatened, or endangered species (denoted in the Basin Plan as the "RARE" beneficial use) or water bodies listed on the CWA Section 303(d) list of Impaired Waterbodies. "Discharging directly to" means Urban Runoff from subject Development or Redevelopment site flows directly into aforementioned water bodies. Urban Runoff is considered a direct discharge unless it first flows through a) A municipal separate storm sewer system (MS4) that has been formally accepted by and is under control and operation of a municipal entity; b) A separate conveyance system where there is co-mingling of flows with offsite sources; or



c) A tributary or segment of a water body that is not designated with “RARE” beneficial uses nor listed on the 303(d) list before reaching the water body or segment designated as RARE or 303(d) listed.

7. Parking lots of 5,000 square feet or more of impervious surface exposed to Urban Runoff, where “parking lot” is defined as a site or facility for the temporary storage of motor vehicles.

It is noted that at the time of this document preparation, projects within the March JPA would not discharge directly to a CWA Section 303(d) listed impaired waterbody. This listing, managed by the SARWQCB, is updated annually and should be reviewed each year.

Significant Redevelopment

“Significant Redevelopment” is the addition or creation of 5,000 or more square feet of impervious surface on an existing developed site. Significant Redevelopment includes, but is not limited to, construction of additional buildings and/or structures, extension of the existing footprint of a building, and construction of impervious or compacted soil parking lots. Where Significant Redevelopment results in an increase of less than 50 percent of the existing impervious surfaces of an existing developed site, and the existing developed site received its discretionary land use approvals prior to the adoption of the WQMP, the WQMP would apply only to the addition, and not the existing development. However, if the redevelopment results in an increase of more than fifty percent of the impervious surface, then a WQMP is required for the entire development. Significant Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, the original purpose of the constructed facility or emergency actions required to protect public health and safety. A redevelopment project is any project where major modifications to an existing site and/or structure requiring a construction permit are undertaken. Routine site maintenance, interior remodeling, minor structural additions (i.e. reproofing) and maintenance of parking lots are exempt from these conditions. For those Significant Redevelopment projects that result in an increase of less than 50 percent of the existing impervious surfaces, the Project proponents should be encouraged to consider ways to incorporate the entire development into the WQMP to achieve possible economies of scale.

WQMP Specific Conditions of Approval

Conditions of Approval are applied at two primary times of the approval process: once at the time of the Plot Plan or Conceptual Design approval (the Preliminary WQMP approval) and then again before grading permits are released (the Final WQMP approval).

Preliminary General Conditions that may be applied at early approval stages include the following:



“Prior to the issuance of conceptual approvals, the applicant shall submit to the JPA for review and approval a project-specific Preliminary WQMP that meets the Preliminary WQMP requirements for:

1. Site Design BMPs such as reducing urban runoff by minimizing impervious areas/footprints, maximizing permeability, minimizing directly connected impervious areas, creating reduced or “zero discharge” areas, and conserving natural areas;
2. Applicable Source Control BMPs as described in the March JPA WQMP template; provide a detailed description of their implementation;
3. Treatment Control BMPs as described in the March JPA WQMP template and provides information regarding design considerations;

For discretionary actions that include a precise plan of development, after the Preliminary WQMP is approved, two General Conditions to be applied by March JPA at the time of Plot Plan or conceptual design approval are as follows:

- 1) The development shall be subject to all provisions of March JPA Provision Number 1.8 (General Plan Resource Management Section (Water Resources)) which states, “Assure that development projects comply with regulatory agency requirements, including Federal, State and Regional regulations.”
- 2) The structural BMPs selected for this project have been approved in concept. The owner shall submit a final WQMP including plans and details providing the elevations, slopes, and other details for the proposed structural BMPs including the gravel pavement, vegetative swales and trash enclosures. The Engineering Department shall review and approve the final WQMP text, plans and details. *(note that this condition is modified for each project).*

Final Conditions

Once the Preliminary WQMP is approved and the project moves forward through engineering and design, the Final WQMP is submitted and approved. The final WQMP conditions of approval, after project-specific references are updated, may include the following:

General Requirements

1. The development shall be subject to all provisions of March JPA Provision Number 1.8 states, “Assure that development projects comply with regulatory agency requirements, including Federal, State and Regional regulations.”



2. During normal and reasonable hours of operation, the on-site facilities manager shall permit March JPA Enforcement Officials, and other designated City, State, or Federal personnel access to all facilities and records to conduct inspections and ascertain whether all site design, source control, and treatment control best management practices (BMP's), approved under WQMP #XXXXXXX, are being implemented effectively.
3. Development of the premises and buildings, and implementation of on-site operations and procedures including all site design, source control, and treatment control BMP's shall conform substantially to the approved Water Quality Management Plan dated XXXXXX and the associated Conditions of Approval dated XXXXXX (PWQMP No.XXXXXX). Any deviation shall require the appropriate Planning Department or Engineering review and approval.
4. An approved WQMP must be amended, submitted and re-approved if there are site design changes or expansion post-WQMP approval. Reviews and approvals will be through Planning Department and Engineering.
5. This WQMP No. XXXXXX shall exist in perpetuity with the use, scope of operations and development of the premises for which it was approved, and the obligation to implement approved project-specific WQMP No. XXXXXX shall be vested with the current and any future owners and property owners' association of the developed site.
6. In accordance with the design for the specific flow-based BMP's approved with this WQMP No. XXXXXX, the owner shall insure that the BMP is maintained for maximum design flow velocities.
7. In accordance with the design for the specific volume based BMP's approved with this WQMP No. XXXXXX, the owner shall insure that no ponding or concentration of water exceeds the maximum drawdown time. Standing water exceeding the drawdown time shall be pumped from all volume based BMP's and disposed of in a manner permitted by law.
8. Any landscaping required in volume based and/or flow-based treatment control BMP's shall be maintained in a viable growth condition.
9. This WQMP No. XXXXXX shall adhere to all applicable building and development codes, including the Uniform Building Code and any applicable city codes and ordinances, and State mandated requirements.
10. This WQMP No. XXXXXX shall conform to the requirements of the Engineering Conditions of Approval as indicated in the approved conditions for Project Number No. XXXXX.



11. This WQMP shall conform to the requirements of the Planning Conditions of Approval as indicated in the approved conditions for Project No. XXXXXX.
12. This approval shall be used within two (2) years of the approval date; otherwise it shall become null and void and of no effect whatsoever. By use is meant the beginning of substantial construction contemplated by this approval within the two (2) year period which is thereafter diligently pursued to completion, or the beginning of substantial utilization contemplated by this approval.
13. Failure to adhere to the conditions of approval set forth and referred to herein, shall be grounds for enforcement action by March JPA Officials, and notification to the State Water Resources Control Board.
14. The owner shall pay any outstanding development processing fees and WQMP plan check review fees.

Prior to the Issuance of Grading Permits

15. The owner shall submit the Owner's Certification Form, signed by the Owner, or Owner's duly authorized representative.
16. The owner shall demonstrate that coverage has been obtained under California's General Permit For Storm Water Discharges Associated with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board (or the Santa Ana Regional Water Quality Control Board) and a copy of the subsequent notification of issuance of a Waste Discharge Identification (WDID) Number or other proof of filing.
17. The proposed XXXXX-acre feet retention basin shall require further detailed drawings prior to the issuance of grading permits to insure that the proposed BMP includes sufficient treatment volume storage and that the proposed design is functional and can accommodate the minimum drawdown time required in the Riverside County BMP Design Manual. The owner shall submit calculations and drawings that verify that the infiltration rate is sufficient to percolate the estimated volumes required for meeting and or exceeding the water quality objectives. The drawdown time cited in Design Worksheet No. 4 submitted with WQMP No. XXXXX is 48-hours with a maximum trench depth of 0.67-feet. Calculations and drawings shall be prepared, stamped and signed by a registered Civil Engineer.
(Note that this condition is modified for each project)
18. The owner shall be aware and inform the on-site project or construction manager and all the prime and lower tier contractors of their responsibility to call for WQMP (Water Quality Management Plan) inspections. A minimum of two (2) WQMP inspections are required in the following order:



- a. At the time of precise grade and construction of flow-based/volume based BMP's, and/or installation of storm drain and WQMP equipment, when the trenches are still open; and
 - b. At final inspection, when all plant materials, structural treatment control BMP's, stenciling, employee source control handbooks, and WQMP equipment have been installed and are fully operational.
19. A written clearance letter shall be signed by the March JPA Engineering Department to signify approval of WQMP site design, source control and treatment control BMP's (Best Management Practices). This letter will need to be presented to Building and Safety Department as part of the final approvals.

Prior to the Issuance of Building Permits

20. The owner shall submit a "Covenant and Agreement" to the March JPA for review and approval. The Covenant and Agreement shall substantially comply with the form, language and content provided in Exhibit F of the Riverside County Water Quality Management Plan for Urban Run-off, dated September 17, 2004.
21. The owner shall record the submitted and signed "Covenant and Agreement," acceptable to the March JPA, with the Riverside County Recorder's Office, to inform future property owners of the requirement to implement the approved project-specific WQMP No. XXXXXXXX. The owner shall submit proof of recording, in the form of a certified copy of the recorded instrument, to the March JPA.

Prior to the Issuance of Occupancy Permits

22. The owner shall demonstrate that all structural BMPs described in the approved project-specific WQMP No. XXXXXXXX have been constructed and installed in conformance with approved plans and specifications.
23. The owner shall demonstrate that the applicant is prepared to implement all non-structural BMPs described in the approved project specific WQMP No. XXXXXXXX.
24. The owner shall demonstrate that an adequate number of copies of the approved project-specific WQMP are available on the project site for use by on-site staff, and for any future property owners or management team.
25. If the business use is subject to California's General Permit for Storm Water Discharges Associated with Industrial Activity as defined by the Standard



Industrial Classification (SIC) Code, the owner shall demonstrate that coverage has been obtained by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the notification of issuance of a Waste Discharge Identification (WDID) Number or other proof of filing.

26. The owner shall first obtain clearance from the March JPA Engineering verifying that all pertinent conditions of approval, including but not limited to non-structural source control BMP's, have been met.
27. A written clearance letter shall be signed by the March JPA Engineering Department to signify approval of WQMP site design, source control and treatment control BMP's (Best Management Practices). This letter will need to be presented as part of the final approvals.

Special Conditions to be applied by March JPA:

When a building is being proposed for which no anticipated use is designated or when an unanticipated element of land use or occupancy is proposed after a basic building has already been completed, use of language similar to the following conditions are recommended for inclusion in the conditions which must be satisfied prior to issuance of the appropriate permit:

- Prior to issuance of certificates of occupancy or building permits for individual tenant improvements or construction permits for a tank or pipeline, uses shall be identified and, for specified uses (where the proposed improvements will store, generate or handle hazardous materials in quantities that will require permitting and inspection once operational), the applicant shall propose plans and measures for chemical management (including, but not limited to, storage, emergency response, employee training, spill contingencies and disposal) to the satisfaction of the Riverside County Fire and Riverside County Department of Environmental Health and Hazardous Materials.
- Chemical management plans shall be approved by the appropriate agencies such as County Fire Department, the Riverside County Department of Environmental Health and Hazardous Materials, and sewerage and/or water agencies to ensure implementation of each agency's respective requirements. Approval by the appropriate agencies shall be furnished to the Building and Safety Department, prior to the issuance of any certificates of use and/or occupancy.



5.0 Project-Specific WQMP Preparation

Category projects must submit a project-specific WQMP to the JPA for review and approval. Project applicants (owners and/developers) must submit a project-specific WQMP. The WQMP template is attached to this guidance document:

1. A project description and site characterization including preparation of a vicinity map and site plan detailing BMPs.
2. Pollutants of Concern and Hydrologic Conditions of Concern related to the project.
3. Site Design BMPs
4. Source Control BMPs
5. Treatment Control BMPs or a Regional, watershed approach; including basis for selection, sizing of Treatment Control BMPs. (Note: Existing regional flood control retention basins cannot be identified or utilized as a regional BMP).
6. An operation and maintenance requirements program for long term maintenance and responsible entities for BMPs.
7. Proposed funding source for operations and maintenance of BMPs. Where a public agency is identified as the funding source and responsible party for BMPs, a written agreement that states acceptance of these responsibilities by the public agency must be provided. For Projects not participating in a regional or watershed-based Treatment Control BMP program, a preliminary or final project-specific WQMP must be prepared and submitted to the March JPA for review and approval in conjunction with considering any map or permit for which discretionary approval is sought.

For Projects participating in regional or watershed-based Treatment Control BMP programs, the regional or watershed-based Treatment Control BMP program may be relied upon during the discretionary review process subject to a discussion of how the project will participate in the program. However, a preliminary project-specific WQMP shall be developed, submitted and approved by the JPA concurrently with any map or permit for which discretionary approval is sought. The preliminary project-specific WQMP shall identify which pollutants and Hydrologic Conditions of Concern will be addressed by the regional or watershed-based Treatment Control BMP and any additional on-site Treatment Control BMPs that will be needed to address pollutants and Hydrologic Conditions of Concern not controlled by the regional or watershed-based facilities. (Note: Existing regional flood control retention basins cannot be identified or utilized as a regional BMP).

WQMPs submitted during the land use entitlement process will depend upon the level of detail known about the overall project design at the time project approval is sought. The project-specific WQMP must clearly identify the case number (tract number, use case number, design review number, address, etc.) for the project. The project-specific WQMP shall include a Site Plan (e.g., copy of the tentative map, use exhibit, or other equivalent figure) identifying the major features of the proposed project. Locations of activities,



storage areas, or other features that could expose Urban Runoff to pollutants must be clearly identified on the Site Plan (e.g., map, exhibit, or figure).

Information below provides a summary of the typical WQMP requirements for the Riverside County MS4 Permit. Although March JPA is not subject to the MS4 permit, the agency intends to fully implement the water quality objectives of the MS4 Permit. **The Preliminary WQMP will only require those elements noted**, with some sections highlighting limited requirements for submittal. The same template is used for both the PWQMP and final WQMP.

Section I - Project Description (Preliminary and Final)

The project description shall completely and accurately describe in narrative form with supporting figures (maps and exhibits) detailing the location(s) of the following:

- Facilities will be located on site
- Activities that will be conducted at the site
- Kinds of materials will be used and/or stored at the site (facilities)
- How and where materials will be delivered at the site
- Types of wastes that will be generated on site

The following information shall be described, provided and/or addressed in the "Project Description" section of a project-specific WQMP:

- The name(s), address(es), and phone number(s) of the project owner, project proponent and project-specific WQMP preparer;
- The project's site address, including APN number(s) and Thomas Brothers map page(s) and grids;
- Planning Area/Commercial Site Name;
- The watershed in which the project is located (Santa Ana) and sub-watershed (Santa Ana, San Jacinto), and Reach found in the Water Quality Control Basin Plan for the Santa Ana River Basin (http://www.waterboards.ca.gov/santaana/html/basin_plan.html);
- Project site size to the nearest 0.1 acre, and the pre-project and post-project quantity (square feet or acres) and percentage of pervious to impervious surface;
- Standard Industrial Classification (SIC) code for commercial or industrial projects (depending upon future tenants);
- Identification of whether a Home Owners Association (HOA) or Property Owners Association (POA) will be formed;
- The final project-specific WQMP shall include a copy of the final conditions of approval included as an appendix;
- A copy of CC&Rs for the project, if applicable, included as an appendix;
- A vicinity map (Appendix B) showing the project site and surrounding planning areas in sufficient detail to allow project site to be plotted on a base map of the JPA;
- A site map(s) (Appendix B) depicting the following project features:
 - Number and type of structures and the intended use (buildings, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.);



- Paved areas and the intended use (parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.);
- Landscaped areas;
- Infrastructure (streets, storm drains, etc.) that will revert to public agency ownership and operation;
- Location of existing and proposed drainage facilities (storm drains, channels, basins, etc), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated;
- All proposed structural BMPs (source control and treatment control), their location, references to details, specifications, and product information
- Location(s) of Receiving Waters/Water Body to which the project directly or indirectly discharges.

Section II - Site Characterization (Preliminary and Final)

The following information shall be addressed in the "Site Characterization" section of a project-specific WQMP:

- Current and proposed zoning or land use designation;
- Current actual use of project site (undeveloped, previously developed but vacant, existing structures, etc.);
- Name(s) of Receiving Water(s) to which the project site discharges directly or indirectly. Identification of any CWA 303(d) listed impaired Water Quality Limited Segments and or Total Maximum Daily Loads (TMDLs) for the identified Receiving Waters/Water Body;
- Designated beneficial uses for Receiving Waters to which the project site discharges, including proximity to Receiving Waters with a "RARE" beneficial use;
- If a Phase 1 environmental site assessment has been prepared for the project site, a summary of the site remediation conducted (or to be conducted) and any site use restrictions;
- If infiltration BMPs are proposed, a soils report should be included as an appendix identifying the soil type(s), infiltration capacity of the soils, and depth to groundwater.

To assist with the site specific watershed information the Riverside County Flood Control District has developed an interactive web page that provides basic watershed information. The web link is:

http://www.floodcontrol.co.riverside.ca.us/gis_npdes/home.htm

Section III - Identify Pollutants of Concern (Preliminary and Final)

Potential Urban Runoff pollutants associated with the proposed project must be identified. Refer to the table 1 below for brief descriptions of typical pollutants associated with Urban Runoff and a table that associates typical potential pollutants with types of development (land use). It should be noted that at the March JPA's discretion, the March JPA may also accept updated studies from the California Association of stormwater



Quality Agencies (CASQA), USEPA, SWRCB and/or other commonly accepted agencies/associations acceptable for determination of Pollutants of Concern associated with given land use. Additionally, in identifying Pollutants of Concern, the presence of legacy pesticides, nutrients, or hazardous substances in the site's soils as a result of past uses and their potential for exposure to Urban Runoff must be addressed in project-specific WQMPs. March JPA may also require specific pollutants commonly associated with Urban Runoff to be considered as Pollutants of Concern for a specific project based on known problems, such as water quality standards exceedances or 303(d) impairment, in the Receiving Waters and suspected association with that land use.

The list of potential Urban Runoff pollutants identified for the project must be compared with the pollutants identified as causing an impairment of Receiving Waters, if any. To identify pollutants impairing proximate Receiving Waters, each project proponent preparing a project-specific WQMP shall, at a minimum, do the following:

- For each of the proposed project discharge points, identify the proximate Receiving Water for each discharge point, using hydrologic unit basin numbers as identified in the most recent version of the Water Quality Control Plan for the Santa Ana River Basin, as appropriate http://www.waterboards.ca.gov/santaana/html/basin_plan.html.
- Identify each proximate Receiving Water identified above that is listed on the most recent list of Clean Water Act Section 303(d) list of Water Quality Limited Segments, which can be found at: www.waterboards.ca.gov/tmdl/303d_lists.html. List all pollutants for which the proximate Receiving Waters are impaired.
- Compare the list of pollutants for which the proximate Receiving Waters are impaired with the potential pollutants of concern generated by the project. The combination of Site Design BMPs, Source Control BMPs, and Treatment Control BMPs incorporated into the project plans must address the potential Pollutants of Concern identified for the project. Further, the selection of a Treatment Control BMP (or BMPs) for the project must specifically consider the effectiveness of the Treatment Control BMP for pollutants identified as causing an impairment of Receiving Waters to which the project will discharge Urban Runoff. See BMP Selection, for additional guidance in selecting appropriate BMPs to address Pollutants of Concern.



Urban Runoff Pollutants by Land Use Type:

Type of Development	Sediment/ Turbidity	Nutrients	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Bacteria & Viruses	Oil & Grease	Pesticides	Metals
Detached Residential Development	P	P	N	P	P	P	P	P	N
Attached Residential Development	P	P	N	P	P ¹	P	P ²	P	N
Commercial/Industrial Development	P ¹	P ¹	P ⁵	P	P ¹	P ³	P	P ¹	P
Automotive Repair Shops	N	N	P ^{4,5}	P	N	N	P	N	P
Restaurants	N	N	N	P	P	P	P	N	N
Hillside Development	P	P	N	P	P	P	P	P	N
Parking Lots	P ¹	P ¹	P ⁴	P	P ¹	P ⁶	P	P ¹	P
Streets, Highways & Freeways	P	P ¹	P ⁴	P	P ¹	P ⁶	P	P ¹	P

Abbreviations:

P=Potential; N=Not Potential

- 1) A potential pollutant if landscaping or open area exists on the Project site.
- 2) A potential pollutant if the project includes uncovered parking areas.
- 3) A potential pollutant if land use involves animal waste.
- 4) Specifically, petroleum hydrocarbons.
- 5) Specifically, petroleum hydrocarbons
- 6) Bacterial indicators are routinely detected in pavement runoff.

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Section IV - Identify Hydraulic Conditions of Concern (Preliminary (Limited) and Final)

Impacts to the hydrologic regime resulting from Projects may include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding the downstream channel. These changes have the potential to permanently impact downstream channels and habitat integrity.

The Permit requires that developments minimize changes to hydrology to ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion, sedimentation or stream habitat. Urban Runoff and associated impacts may be reduced by minimizing impervious surfaces, maintaining existing vegetation, and incorporating other site-design concepts that replicate or reduce impacts to the pre-development condition. The goal of these site design techniques is to achieve post development runoff flow rates, volumes, velocities and durations that prevents significant increases in downstream erosion compared to the pre-development conditions and prevents significant adverse impacts to stream habitat during the 2-year and 10-year, 24-hour rainfall event. A project-specific WQMP must address the issue of Hydrologic Conditions of Concern unless one or more of the following conditions are met:

Condition A: Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4; the discharge is in full compliance with March JPA requirements for connections and discharges to the MS4 (including both quality and quantity requirements); the discharge would not significantly impact stream habitat in proximate Receiving Waters; and the discharge is authorized by the JPA.

Condition B: The project disturbs less than 1 acre. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Condition C: The project's runoff flow rate, volume, velocity and duration for the post development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year, 24-hour rainfall events. This condition can be achieved by minimizing impervious area on a site and incorporating other site-design concepts that mimic pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the March JPA.

For all other Projects, the project-specific WQMP shall demonstrate that discharge flow rates, velocities, durations, and volumes from a 2-year and 10-year, 24-hour rainfall event will not significantly impact downstream erosion or stream habitat. The project applicant shall provide sufficient information to demonstrate to the March JPA that the Project will not cause significant adverse impacts, or has mitigated significant impacts to downstream erosion or stream habitat.



For a Preliminary WQWP, only the condition (A,B or C) needs to be selected and stated in the text. Associated calculations will not be necessary until final WQMP submittal.

The Riverside College Citrus Experimental Rain Station data will be utilized for rain event calculations for both hydrology and BMP design.

If adverse hydrologic impacts are identified and they are not fully mitigated by the implementation of Site Design BMP concepts, then the Project proponent shall, based upon consultation with the March JPA, use one of the following methodologies to address identified adverse impacts:

Methodology A

Project applicant shall design a detention basin capable of all of the following:

1. Releasing the post-development 2-year and 10-year, 24-hour volume at flow rates less than or equal to the pre-development 2-year and 10 year, 24-hour peak flow rates, respectively.
2. Passing the 100-year storm event without damage to the facility.
3. Controlling outlet velocities such that downstream erosion and habitat loss is minimized. The basin may also function as a water quality extended detention basin, or serve other multi-use functions, with the approval of the local agency.

Methodology B

Any method acceptable to the March JPA that:

1. Implements Site Design, Source Control, Treatment Control BMPs and/or other measures capable of mitigating the assessed hydrologic impacts. The method must be supported by hydrologic modeling or other sufficient documentation. Sufficient documentation could include reference to USEPA, CASQA, SWRCB and/or other approved studies supporting the use of the method.
2. Ensures that the project will be consistent with any approved master plans of drainage or analogous plans or programs. Hydrologic Condition of Concern BMPs should be designed in accordance with local vector control regulations and requirements. If a particular BMP does not meet vector control requirements, other BMPs should be considered. However, when the March JPA determines that a detention basin is the most effective way to address Hydrologic Conditions of Concern, the March JPA may approve minor deviations from the design criteria specified in this section to ensure that local vector control requirements are not violated (e.g. 72 hour drain times from a basin full condition).

Section V - BMP Selection (Preliminary and Final)

The Drainage Area Management Plan (DAMP) requires identification and implementation of BMPs for new development via regulatory and enforcement activities.



This guidance document lists particular routine structural and nonstructural BMPs that will be evaluated for application and intensity for these activities.

Structural Controls: Physical facilities or controls which may include secondary containment, first flush diversion, detention/retention basins, infiltration trenches/basins, oil/grease separators, grass swales, and engineering and design modification of existing structures. These examples include both routine structural controls and special structural controls.

Non-structural Controls: In general, these would be activities or programs to educate the public on proper disposal of hazardous/toxic wastes, regulatory approaches, street sweeping and facility maintenance, detection and elimination of illicit connections and illegal dumping.

Each new development will be required to implement appropriate non-structural BMPs in keeping with the size and type of development, and potential for stormwater pollution, to minimize the introduction of pollutants onto the drainage system.

Each new development will also be required to implement appropriate "routine" structural BMPs in keeping with the size and type of development, and potential for stormwater pollution. "Routine" structural BMPs are economical, practicable, small scale measures which can be feasibly applied at the smallest unit of development.

A major concept of the County's NPDES stormwater quality program, as set forth in the Riverside County DAMP, is a regional approach to stormwater quality planning and management on a watershed basis. Later, "special" structural BMPs may be installed to address any specific water quality problems identified in the watershed planning process. "Special" structural BMPs are engineered facilities designed to address specific water quality problems identified in the watershed planning process, runoff management plan, CEQA process, or similar watershed planning. There may be the need to revisit these requirements at an as yet unspecified date or frequency.

Efforts will be directed toward determining the effectiveness of structural BMPs before they are required. Those measures which demonstrate superior cost-effectiveness, considering right-of-way, construction, operation, maintenance, monitoring, and pollutant removal, may be adopted as special structural BMPs for application as indicated during the watershed planning studies. A summary of potential BMPs for New Development and Significant Redevelopment are shown below.

Pollutants of Concern include pollutants that are listed as causing or contributing to impairments of Receiving Waters/Water Body. BMPs must be selected so that the project does not cause or contribute to an exceedance of water quality objectives. Strategies to minimize the Pollutants of Concern in runoff from the project site and minimize hydrologic impact include Site Design BMPs, Source Control BMPs, and Treatment



Control BMPs. In preparing a project-specific WQMP, BMPs should be considered and incorporated into the project design plans, in the following progression:

- Site Design BMPs
- Source Control BMPs (Non-Structural and Structural)
- Treatment Control BMPs (or participation in a regional or watershed program)

BMP designs, including Site, Source Control and Treatment BMPs will be approved by the March JPA civil engineer as part of the WQMP review process.

Site Design BMPs aim to incorporate site features such as vegetation to reduce and control post development runoff rates. Because Site Design BMPs reduce runoff, incorporating them into project design plans minimizes the:

- Transport mechanism (runoff) for moving pollutants off site, difference between pre- and post-development hydrology thereby reducing changes in flow regime, and size of necessary Treatment Control BMPs to treat Pollutants of Concern in Urban Runoff prior to discharge from the site or at regional facilities.

Source Control BMPs reduce the potential for Urban Runoff and pollutants from coming into contact with one another. Source Control BMPs are defined as any administrative action, design of a structural facility, usage of alternative materials, and operation, maintenance, and inspection procedures that eliminate or reduce Urban Runoff pollution. Each Project is required to implement appropriate Source Control BMPs.

Treatment Control BMPs are defined as any engineered system designed and constructed to treat the adverse impacts of Urban Runoff pollution. These BMPs may remove Pollutants of Concern by filtration, media absorption, or other physical, biological, or chemical process. It should be noted that where the project proponent believes that design criteria adequately addresses Pollutants of Concern and Treatment Controls are not needed, a request for a waiver must be submitted to and approved by the March JPA.

Site Design BMPs, Source Control BMPs, and Treatment Control BMPs most effectively protect water quality when used in combination. Site Design and Source Control BMPs may be implemented to a level that significantly reduces the size or extent to which Treatment Control BMPs need to be implemented. BMPs should be located as close to the pollutant source as appropriate and economically/technologically feasible, and before Urban Runoff is discharged into Receiving Waters. Thus, some of the BMPs listed under Sections Non-structural measures; Routine Structural measures, and Special Structural BMPs, herein will become conditions of approval for new development and construction.



Section VI and VII– Operations, Maintenance and Funding (Final WQMP only)

Project and owner specific information on the Operation and Maintenance (O&M) requirements for all structural Source Control and Treatment Control BMPs shall be identified in the project-specific WQMP. The project-specific WQMP shall address the following:

- Identification of each BMP that requires O&M.
- Thorough description of O&M activities, the O&M process, and the handling and placement of any wastes.
- BMP start-up dates.
- Schedule of the frequency of O&M for each BMP.
- Identification of the parties (name, address, and telephone number) responsible for O&M, including a written agreement with the entities responsible for O&M.
- Self-inspections and record-keeping requirements for BMPs

A funding source or sources for the O&M of each Treatment Control BMP identified in the project-specific WQMP must be identified. By certifying the project-specific WQMP, the Project applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners.

The March JPA will not be identified as participating in Operations and Maintenance Activities for any BMPs. All BMPs within the March JPA will be managed by the property owner or property owners association for each individual development.



6.0 BMP Selection

Best management practices selection is required based on three water quality design elements: Site Design, Source Control and Treatment Control. Site Design is the basis of water quality control and includes the following Design Concepts:

- Minimize Urban Runoff
- Minimize Impervious Footprint
- Conserve Natural Areas
- Minimize Directly Connected Impervious Areas

All sites must be designed utilizing these concepts. The WQMP template and manual provides specifics for selecting site design BMPs. The overall property site design is the first step in selecting project specific BMPs.

Source Control BMPs are also called non-structural BMP measures and includes activity restrictions, training and site inspections. Identifying the source control BMPs is typically the second step to overall BMP selection.

Treatment Control BMPs are the final management practices to be included. Only after site design and source control BMPs have been identified, should treatment control BMPs be included. Treatment control BMPs are to be selected for those remaining known pollutants or for the pollutants identified in 303(d) water bodies or Total Maximum Daily Loads (TMDLs). When a treatment control BMP is selected, whether structural or mechanical, is must comply with the requirement to provide treatment at a medium or high treatment level. Efficiency ratings may need to be examined depending on the site characteristics (proximity to receiving waters, pollutants of concern, site activities). Data documenting tested known BMP efficiencies will need to be provided before a BMP is approved for a site. Requested data will vary depending on the BMP type.

The following list presents typically selected BMPs for most residential and industrial/commercial projects. Specific design requirements can be found on the Riverside County Flood Control District web site. Appendix O of the DAMP presents the WQMP text and BMP design requirements:

<http://www.floodcontrol.co.riverside.ca.us/districtsite/default.asp>

At the time of writing, these design requirements were in the process of revision by the Riverside County Flood Control District. The revisions will be included into this document separately by resolution.

Non-structural BMP Measures



Education for Property Owners, Tenants and Occupants

Project conditions of approval for all new developments will require that the developer provide environmental awareness education materials on general good housekeeping practices that contribute to protection of stormwater quality to all initial residents, occupants/tenants. Such materials may be provided to the developer through the County-wide education program. Different materials for residential, office commercial, retail commercial, vehicle-related commercial and industrial uses may be involved. Please refer to the following website for the materials:
<http://www.floodcontrol.co.riverside.ca.us/stormwater/>

Activity Restrictions

If a property owners association (POA) or homeowners association (HOA) is formed, conditions, covenants, and restrictions shall include measures for the purpose of surface water quality protection.

Common Area Landscape Management

All pesticides shall be applied in strict accordance to pesticide application laws as stated in the State of California Agricultural Code. All pesticide applicators shall be certified by the State as a Qualified Applicator or be directly supervised by a Qualified Applicator. All fertilizers shall be applied at the rate stipulated by the manufacturer. Fertilizer Applicators shall be trained in the proper procedures of determining fertilizer rates and calibration of application equipment. Fertilizer shall be applied in such a manner as to avoid application onto hardscape surfaces. Annual soil tests are recommended to advise which fertilizer elements are needed to avoid application of unnecessary elements, or over application. The local water agency or resource conservation district can assist with detailed information concerning this BMP.

Common Area Catch Basin Inspection

For developments with POAs/HOAs and privately maintained drainage systems, the association will be required to have privately owned catch basins inspected and, if necessary, cleaned prior to the storm season, no later than October 15th each year.

POA/HOA Common Area Litter Control

For developments with an association, the POA/HOA will be required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water. The associations may contract with their landscape maintenance firms to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, noting trash disposal violations by homeowners or businesses, and reporting the violations to the association for investigation.

Street Sweeping Private Streets and Parking Lots



For developments with POAs/HOAs, and privately owned streets and parking lots, the association will be required to have the streets and parking lots swept prior to the storm season, no later than October 1st each year.

Housekeeping of Loading Docks

Loading docks for grocery, drug and discount stores, and warehouse type commercial and industrial buildings must be kept in a clean and orderly condition through a regular program of sweeping, litter control, and immediate cleanup of spills and broken containers. Polluted material or wash waters shall not be allowed to discharge into a storm drain.

Employee Training/Education Program

Based on information provided through the County-wide education program, developer either prepares manual(s) for initial purchasers of business sites or, for development that is constructed for an unspecified use, conveys commitment for this responsibility to POA or purchaser.

BMP Maintenance

The responsibility for implementation of each non-structural BMP and scheduled cleaning of all structural BMP controls shall be identified (owner, company name, phone number, and address).

Routine Structural BMPs

Control of Impervious Runoff

Impervious areas shall be graded and constructed so as to drain to a filtration BMP, such as a landscaped area or equally effective alternative wherever practicable and as recommended by the engineer of record. Direct drainage from impervious areas to the street or a storm drain facility is discouraged and should be avoided. For example, parking lot catch basins could be placed in landscaped areas with allowances for minor ponding.

Common Area Efficient Irrigation

All sites shall employ multi-programmable irrigation controllers which have enough programs to break up all irrigation stations into hydrozones. Rain shutoff devices shall be employed to prevent irrigation after significant precipitation. Irrigation systems shall be designed so areas which have different water use requirements are not mixed on the same station (hydrozones). Assistance in implementing a schedule based on plant water needs is available from CIMIS or Mobile Lab. The use of drip irrigation should be considered for



all planter areas which have a shrub density that will cause excessive spray interference of an overhead irrigation system. Use flow reducers to mitigate broken heads next to sidewalks, streets and driveways.

Common Area Runoff-minimizing Landscape Design

Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration, where practical. Examples could include the following:

- a. Use mulches in planter areas without ground cover to avoid sedimentation runoff.
- b. Set irrigation times to avoid runoff. This will involve splitting nightly irrigations into several short cycles if slope and soil conditions warrant.
- c. Use only enough water to provide for adequate plant health and growth.
- d. Use the water budget mode to make global/weather related scheduling changes.
- e. Use CIMIS data for global changes so they will accurately reflect weather changes.
- f. Install appropriate plant materials for the location, in accordance with sunset climate zones.
- g. Install plants with low water requirements and consider the use of native plant material where possible and recommended by the landscape architect.

Community Car Wash Racks

In high density multi-family developments (apartments, stacked flats) larger than 100 units where car washing is allowed, and development having a common parking area, a designated car wash area which does not drain directly to a storm drain shall be provided for common usage. An example of such an area would be joint use of an open space or visitor parking area. Wash waters from this area may be directed to the sanitary sewer (with prior approval of the sewer agency), to an engineered infiltration, or equally effective alternative.

Wash Water Controls for Food Preparation Areas

Food establishments (per State Health and Safety Code 27520) shall have contained areas, floor sink(s) and/or mop sink(s) with sanitary sewer connections for cleaning of kitchen floor mats and for disposal of wash waters containing kitchen and food wastes, if located outside. The contained area shall also be covered to prevent entry of stormwater.

Trash Container (dumpster) Areas

Trash container (dumpster) areas shall have drainage from adjoining roofs and pavements diverted around the area(s), and:



- a. Dumpsters shall be leak proof and have attached workable covers.
- b. Trash container areas are to be screened or walled to prevent offsite transport of trash.

Self-contained Areas for Vehicle Washing/Steam Cleaning/ Maintenance/Repair/ Material Processing

Self-contained areas are required for washing/steam cleaning, wet material processing, and maintenance activities, specifically:

- a. For businesses where washing of vehicles without steam cleaning occurs, provide wash racks constructed in accordance with local sewerage agency guidelines or other acceptable standard and with the prior approval of the sewerage agency (Note: Discharge monitoring may be required by the sewerage agency).
- b. Where steam cleaning occurs, provide wash racks or structural containment (with a cover to restrict the entry of stormwater during rain events) runoff from such areas onsite for commercial waste removal.
- c. Where wet material processing occurs (e.g., electroplating), secondary containment structures shall be provided to hold spills resulting from accidents leaking tanks or equipment, or any other unplanned releases (Note: If these are plumbed to the sanitary sewer, the structures and plumbing shall be in accordance with State and local spill containment and reporting requirements and have the prior approval of the sewerage agency). Also see N10.
- d. Where vehicle repair/maintenance occurs, impermeable berms, drop inlets, trench catch basins, or overflow containment structures shall be provided around repair bays to prevent spilled materials and wash-down waters from entering the storm drain system.

Outdoor Storage

Where a plan of development proposes or building plans incorporate outdoor containers of oils, fuels, solvents, coolants, wastes, and other chemicals, the areas where these materials are to be used or stored must be protected by secondary containment structures such as a berm, dike, or curb (see N10). For commercial outdoor vehicle and equipment salvage yards, and commercial outdoor recycling, the entire storage area shall drain through water quality inlets (see SP1).

Motor Fuel Concrete Dispensing Areas

Areas used for fuel dispensing shall be paved with concrete (use of asphalt prohibited). Concrete surfacing must extend a minimum of 8' from the face side of each pump receptacle and 4' from the nose of the pump island. In addition, the fuel dispensing area shall be graded and constructed so as to prevent drainage flow through the concrete fueling area.



Motor Fuel Dispensing Area Canopy

All motor fuel concrete dispensing areas are to have a canopy structure. Canopy roof downspouts are to be routed to prevent drainage across the concrete fueling area.

Energy Dissipators

Energy dissipators such as riprap, are to be installed at the outlets of new storm drains which enter unlined channels in accordance with applicable agency specifications.

Catch Basin Stenciling

Phrase "No Dumping - Only Rain in the Drain" or equally effective phrase as approved by the March JPA is to be stenciled on catch basins to alert the public as to the destination of pollutants discharged into stormwater.

Diversion of Below Grade Loading Dock Drainage

Below grade loading docks for grocery stores and warehouse/distribution centers of fresh food items will drain through water quality inlets (see SP1), or to an engineered infiltration system, or an equally effective alternative.

Inlet Trash Racks

Where appropriate to reduce intake and transport through the storm drain system of large floatable debris, trash racks shall be provided where drainage from open areas enters storm drains (Caltrans Standard Plan D96 and D98-C, or equivalent).

Special Structural BMPs

The following table is provided only as a basic guideline for treatment control selection. The project engineer must consider hydrology, hydraulics, pollutant types, maintenance needs, and proximity to receiving waters (among other site specific parameters) before selecting a treatment control BMP. Additional information for selecting treatment control BMPs are included in the Riverside County WQMP Manual – Appendix O.



Treatment Control BMP Selection Matrix⁽¹⁾

Pollutant of Concern	Biofilters ⁽²⁾	Detention Basins ⁽³⁾	Infiltration BMPs ⁽⁴⁾	Wet Ponds or Wetlands ⁽⁵⁾	Filtration Systems ⁽⁶⁾	Water Quality Inlets	Hydrodynamic Separator Systems ⁽⁷⁾	Manufactured or Proprietary Devices ⁽⁸⁾
Sediment/Turbidity	H/M	M	H/M	H/M	H/M	L	H/M (L for Turbidity)	U
Nutrients	L	M	H/M	H/M	L/M	L	L	U
Organic Compounds	U	U	U	U	H/M	L	L	U
Trash & Debris	L	M	U	U	H/M	M	H/M	U
Oxygen Demanding Substances	L	M	H/M	H/M	H/M	L	L	U
Bacteria & Viruses	U	U	H/M	U	H/M	L	L	U
Oil & Grease	H/M	M	U	U	H/M	M	L/M	U
Pesticides (non-soil bound)	U	U	U	U	U	L	L	U
Metals	H/M	M	H	H	H	L	L	U

(Excerpted, with minor revision, from the Orange County Water Quality Management Plan dated September 26, 2003 and the San Bernardino Water Quality Management Plan dated April 14, 2004)

Abbreviations:

L: Low removal efficiency H/M: High or medium removal efficiency U: Unknown removal efficiency

Notes:

- (1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.
- (2) Includes grass swales, grass strips, wetland vegetation swales, and bioretention.
- (3) Includes extended/dry detention basins with grass lining and extended/dry detention basins with impervious lining. Effectiveness based upon minimum 36-48-hour drawdown time.
- (4) Includes infiltration basins, infiltration trenches, and porous pavements.
- (5) Includes permanent pool wet ponds and constructed wetlands.
- (6) Includes sand filters and media filters.
- (7) Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators (CDS-Stormfilter).
- (8) Includes proprietary stormwater treatment devices (Filterra, Abtech) as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP, or newly developed/emerging stormwater treatment technologies.



7.0 Storm Water Pollution Prevention Plan

Construction General Permit Requirement

State and Federal regulations require discharges of storm water to surface waters associated with construction activities. Dischargers whose project disturbs 1-acre or more of soil are required to obtain coverage under the General Construction permit (Construction General Permit, 99-08-DWQ) that regulates pollutants in discharges of storm water associated with construction activities. These activities include clearing & grubbing, grading, and excavation activities. The following activities are not covered by the General Construction permit: construction under one acre, unless part of a larger common plan of development or sale; projects covered by an individual NPDES Permit for storm water discharges associated with construction activity; and landfill construction that is subject to the general industrial permit.

It is the responsibility of the landowner of properties within March JPA to obtain coverage under the General Construction Permit (Order No. 99-08-DWQ) prior to commencement of construction activities. To obtain coverage, the landowner must file an NOI with a vicinity map and the appropriate fee with the State Water Resources Control Board (SWRCB). Coverage under the permit shall not occur until the applicant develops an adequate Storm Water Pollution Prevention Plan (SWPPP) for the project. For proposed March JPA funded construction activities, the March JPA is responsible for filing an NOI and filing fee and shall be responsible for development of the SWPPP, all of which must occur prior to commencement of construction activities.

General Construction permit requires controls of pollutant discharges that utilize best available technology (BAT) economically achievable and best conventional technology (BCT) to achieve the best conventional pollutant control technology to reduce pollutants and any more stringent controls necessary to meet water quality standards. The SWRCB has not established numeric effluent limits within the Construction permit. Therefore, the effluent limitations contained in this General Permit are narrative and include the requirement to implement appropriate BMPs.

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP should contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list BMPs that the discharger will use to protect storm water runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Section A of the Construction General Permit describes the elements that must be contained in a SWPPP.



Notice of Intent (NOI):

Storm water discharges associated with construction activities that are regulated by a general NPDES storm water permit issued by a Regional Board, shall pay an annual fee of \$200 plus \$20 per acre (rounded to the nearest whole acre and dollar amount), to a maximum fee of \$2,200. Plus any applicable surcharge, based on the total acreage to be disturbed during the life of the project as listed on the NOI.

$$\text{NOI Filing Fee} = \left(\$200 + \frac{\$20}{\text{Acre}} \cdot \text{Area}_{\text{Acres}} \right) \cdot 18.5\% \text{ Surcharge}$$

A separate NOI shall be submitted to the SWRCB for each construction site. An amount equal to the fee prescribed shall be submitted with the discharger's NOI to be regulated under a general NPDES permit and will serve as the first annual fee. Owners of new construction shall file an NOI prior to the commencement of construction. The NOI requirements of the General Construction permit that clearly identifies the responsible parties, locations, and scope of operations of dischargers covered by the General Permit and to document the discharger's knowledge of the requirements for a SWPPP.

The NOI paperwork and fee must be sent to the following address:

State Water Resources Control Board
Division of Water Quality
Storm Water Permit Unit
P.O. Box 1977
Sacramento, CA 95812-1977

The SWRCB is the facilitator for the SWPPP process. All fees and paperwork are processed through this agency. After processing, the local Regional Water Quality Control Board (for March JPA, the local Board is the Santa Ana RWQCB) is assigned the project for inspection and follow-up. SWPPPs will be reviewed by the RWQCB staff if necessary.



Storm Water Pollution Prevention Plan Guidelines

The General Construction permit requires development and implementation of a SWPPP. This document gives water dischargers direction and guidelines for pollution reduction BMPs. All dischargers shall prepare and implement a SWPPP prior to disturbing a site. The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the Construction project. Non-storm water BMPs must be implemented year round. The SWPPP shall remain on the site while the site is under construction, commencing with the initial mobilization and ending with the termination of coverage under the permit.

The SWPPP template and the requirements can be found at the State Water Resources Control Board web site:

http://www.waterboards.ca.gov/stormwtr/gen_const.html#const_permit

The SWPPP has two major objectives: (1) Identify the sources of sediment and other pollutants that affect the quality of storm water discharges and (2) Describe and ensure the implementation of BMPs are selected that will reduce or eliminate sediment and other pollutants in storm water as well as non-storm water discharges. The SWPPP shall include BMPs to address source and pollutant control.

The required elements of a SWPPP include:

- (a) Site description addressing the elements and characteristics specific to the site
- (b) Descriptions of BMPs for erosion and sediment controls
 - Area of disturbed soils, vegetative areas
 - BMPs for Erosion and Wind control
- (c) Post-construction control BMPs (Erosion, Sediment)
 - Operation & Maintenance of BMPs after project completion
 - Runoff Coefficient (Pre/Post Construction)
- (d) Post-construction control BMPs for Non-storm water management
- (e) Construction waste handling and disposal BMPs
 - Toxic materials treated, stored or spilled
 - Waste handling and disposal
 - Minimize contact of contaminants with stormwater
- (f) Implementation of approved local plans



Best Management Practices for Construction Stormwater:

Erosion Control Practices

SS-1	Scheduling	SS-7	Geotextiles, Plastic Covers & Erosion Control Blankets
SS-2	Preservation of Existing Vegetation	SS-8	Wood Mulching
SS-3	Hydraulic Mulch	SS-9	Earth Dikes/Drainage Swales & Ditches
SS-4	Hydroseeding	SS-10	Outlet Protection/Velocity Dissipation Devices
SS-5	Soil Binders	SS-11	Slope Drains
SS-6	Straw Mulch		

Sediment Control Practices

SE-1	Silt Fence	SE-6	Gravel Bag Berm
SE-2	Desilting Basin	SE-7	Street Sweeping & Vacuuming
SE-3	Sediment Trap	SE-8	Sand Bang Barrier
SE-4	Check Dam	SE-9	Straw Bale Barrier
SE-5	Fiber Rolls	SE-10	Storm Drain Inlet Protection
TR-1	Stabilized Construction Entrance/Exit	TR-2	Stabilized Construction Roadway
TR-3	Entrance/Outlet Tire Wash		

Non-Storm Water Control Practices

NS-1	Water Conservation Practices	NS-6	Illicit Connection/Discharge
NS-2	Dewatering Operations	NS-7	Potable Water/Irrigation
NS-3	Paving & Grinding Operations	NS-8	Vehicle & Equipment Cleaning
NS-4	Temporary Stream Crossing	NS-9	Vehicle & Equipment Fueling
NS-5	Fiber Rolls	NS-10	Vehicle & Equipment Maintenance

Waste Management & Materials Pollution Control Practices

WM-1	Material Delivery & Storage	WM -6	Hazardous Waste Management
WM-2	Material Use	WM -7	Contaminated Soil Management
WM -3	Stockpile Management	WM -8	Concrete Waste Slurry Management
WM -4	Spill Prevention & Control	WM -9	Sanitary/Septic Waste Management
WM -5	Solid Waste Management	WM -10	Liquid Waste Management

CASQA Construction Handbook, 2004 (website: <http://www.cabmphandbooks.com/Construction.asp>)



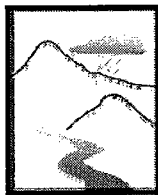
Monitoring Program:

Another major feature of the General Permit is the development and implementation of a monitoring program. All dischargers are required to conduct inspections of the construction site prior to anticipated storm events and after actual storm events. During extended storm events, inspections must be made during each 24-hour period.

The goals of these inspections:

- (1) Identify areas contributing to storm water discharges;
- (2) Evaluate whether pollutant loading reductions identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Construction permit;
- (3) Additional control practices or corrective maintenance activities are needed equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

Each discharger shall certify annually that the construction activities are in compliance with the requirements of the General Construction permit. Dischargers who cannot certify annual compliance shall notify the Santa Ana Regional Water Quality Control Board.



**Storm Water
Clean Water**
PROTECTION PROGRAM

**RIVERSIDE COUNTY
WATER QUALITY MANAGEMENT PLAN
FOR URBAN RUNOFF**

Santa Ana River Region

Santa Margarita River Region

July 24, 2006

Errata corrected 10-10-06

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1.0 Introduction

This Water Quality Management Plan (WQMP)¹ has been developed to further address post-construction Urban Runoff from New Development and Significant Redevelopment projects under the jurisdiction of the Co-Permittees. Since 1996 the Permittees have addressed the potential post-construction impacts associated with Urban Runoff through Supplement A, New Development Guidelines, to the Santa Ana River Region and Santa Margarita River Region Drainage Area Management Plans (DAMPs) and the Whitewater River Watershed Stormwater Management Plan (SMP).

The three municipal separate storm sewer system National Pollutant Discharge Elimination System permits (MS4 Permits) applicable within portions of Riverside County are:

- Order No. R8-2002-0011, NPDES No. CAS 618033 adopted by the Santa Ana Regional Water Quality Control Board on October 25, 2002 for the Santa Ana River region.
- Order No. 01-077, NPDES No. CAS 617002 adopted by the Colorado River Basin Regional Water Quality Control Board on September 5, 2001 for the Whitewater River region.
- Order No. R9-2004-001, NPDES No. CAS 108766 adopted by the San Diego Regional Water Quality Control Board on July 14, 2004 for the Santa Margarita River region.

The WQMP will be implemented with watershed-specific variations to reflect the differences in the MS4 Permits applicable within portions of Riverside County². When approved the WQMP becomes an enforceable element of the MS4 Permit and is applicable to all Co-Permittees.

The WQMP is intended to provide guidelines for project-specific post-construction Best Management Practices (BMPs) and for regional and sub-regional Source Control BMPs and Structural BMPs to address management of Urban Runoff quantity and quality to protect Receiving Waters. The WQMP identifies the BMPs, including design criteria for Treatment Control BMPs that may be applicable when considering any map or permit for which discretionary approval is sought. Examples may include tentative tract maps, parcel maps with land disturbing activity, discretionary grading permits where the Project is not part of a master plan of development and conditional use permits.

Implementation of the WQMP will occur through the review and approval by the Co-Permittee of a project-specific WQMP prepared by the project applicant. The project-specific WQMP will address management of Urban Runoff from a Project site, represented by a map or permit for which discretionary approval is sought from a Co-Permittee. The primary objective of the WQMP, by addressing Site Design, Source Control, and Treatment Control BMPs applied on a project-specific and/or sub-regional or regional basis, is to ensure that the land use approval and permitting process of each Co-Permittee will minimize the impact of Urban Runoff.

This WQMP will be implemented by the Co-Permittees as follows:

- For the Santa Ana River Region, New Development and Significant Redevelopment projects submitted to the Co-Permittees after December 31, 2004 shall be required to submit a project-specific WQMP prior to the first discretionary project approval or permit. A Co-Permittee may require a project-specific WQMP for Projects submitted to them prior to December 31, 2004. Since some projects will be subject to discretionary approval during the planning phase (land use entitlement) and ministerial approval for subsequent grading or building permits, Project applicants may be required to submit a preliminary project-specific WQMP for discretionary project approval (land use entitlement). Project applicants shall be required to submit for Co-

¹ Some of the Regional Water Quality Control Boards utilize the term Standard Urban Stormwater Mitigation Plan (SUSMP) rather than Water Quality Management Plan (WQMP).

² The requirements for New Development and Significant Redevelopment are addressed in the Stormwater Management Plan for the Whitewater River Watershed.

Permittee review and approval a final project-specific WQMP that is in substantial conformance with the preliminary project-specific WQMP prior to the issuance of any building or grading permit.

- For the Santa Margarita River Region, development Projects that do not have Conditions of Approval or Tentative Tract, Subdivision, or Parcel map approval by July 13, 2005 will be required to submit a project-specific WQMP for review and approval prior to discretionary approval of the map or permit. Since some projects will be subject to discretionary approval during the planning phase (land use entitlement) and ministerial approval for subsequent grading or building permits, Project applicants may be required to submit a preliminary project-specific WQMP for discretionary project approval (land use entitlement). Project applicants shall be required to submit for Co-Permittee review and approval a final project-specific WQMP that is in substantial conformance with the preliminary project-specific WQMP prior to the issuance of any building or grading permit.

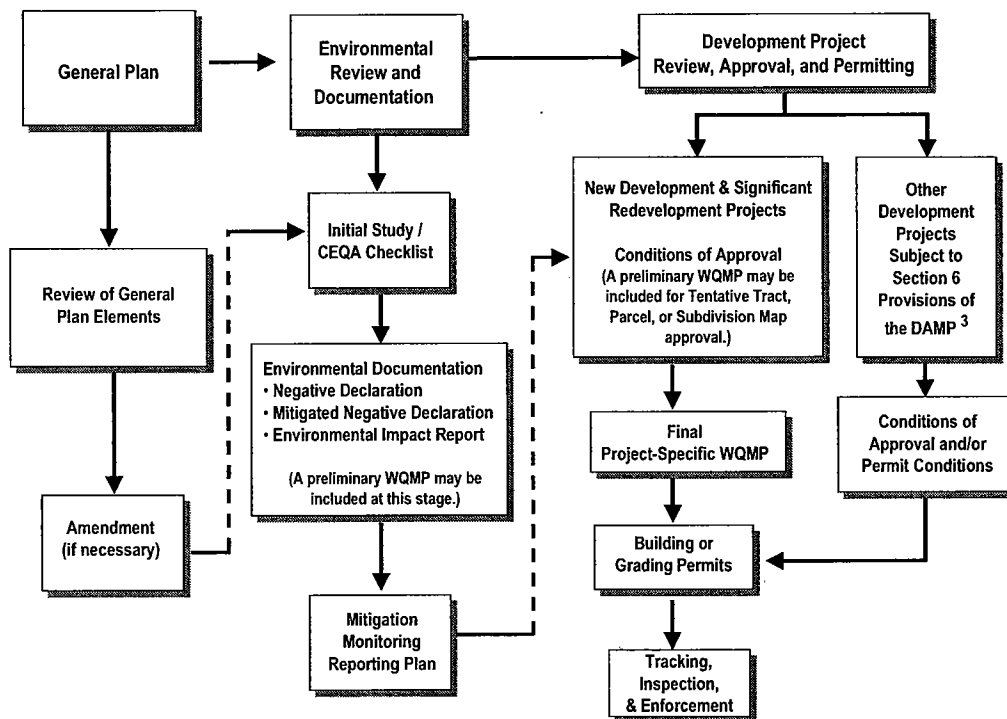
2.0 Development Planning and Permitting Process

2.1 Overview

The planning and permitting process to implement the WQMP requirements for Projects is incorporated in three primary elements of the development approval process:

- General Plan
- Environmental Review and Documentation
- Project Review, Approval, and Permitting.

The relationship between these elements of the development approval process and WQMP implementation is depicted in the flowchart below.



Section 6 of the DAMP provides the overall framework for the planning, design, review, approval, and permitting of land use development to manage Urban Runoff for the protection of Receiving Waters. This WQMP is only one component of the overall framework, and as stated previously, it provides guidelines for project-specific post-construction BMPs, as well as, alternatives for regional and sub-regional

³ Until the revised DAMP, due to be submitted to the Regional Board on January 1, 2005, has been approved by the Executive Officer, other development projects shall continue to comply with the April 1996 Supplement A to the 1993 DAMP.

Treatment Control BMPs. New Development and Significant Redevelopment projects as defined by the MS4 Permits will be conditioned to require the preparation, review, and approval of a project-specific WQMP. Other development projects will be required to incorporate site, source, and/or treatment control BMPs through Co-Permittee Conditions of Approval or permit conditions in accordance with Section 6 of the DAMP⁴.

2.2 Conditions of Approval

The Co-Permittees will utilize conditions of approval to implement the WQMP requirements. Each Co-Permittee will utilize the following (or substantially similar) conditions of approval for Projects:

- Prior to the issuance of a building or grading permit, the applicant shall submit to the Co-Permittee for review and approval a project-specific WQMP that:
 - Addresses Site Design BMPs such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, creating reduced or “zero discharge” areas, and conserving natural areas;
 - Incorporates the applicable Source Control BMPs as described in the Santa Ana River (or Santa Margarita River) Region WQMP and provides a detailed description of their implementation;
 - Incorporates Treatment Control BMPs as described in the Santa Ana River (or Santa Margarita River) Region WQMP and provides information regarding design considerations;
 - Describes the long-term operation and maintenance requirements for BMPs requiring long-term maintenance; and
 - Describes the mechanism for funding the long-term operation and maintenance of the BMPs requiring long-term maintenance.
- Prior to issuance of any building or grading permits, the property owner shall record a “Covenant and Agreement” with the County-Clerk Recorder or other instrument acceptable to the Co-Permittee on a form provided by the Co-Permittee to inform future property owners of the requirement to implement the approved project-specific WQMP. Other alternative instruments for requiring implementation of the approved project-specific WQMP include: requiring the implementation of the project-specific WQMP in Home Owners Association or Property Owner Association Conditions, Covenants and Restrictions (CC&Rs); formation of Landscape, Lighting and Maintenance Districts, Assessment Districts or Community Service Areas responsible for implementing the project-specific WQMP; or equivalent may also be considered. Alternative instruments must be approved by the Co-Permittee prior to the issuance of any building or grading permits.
- If the project will cause land disturbance of one acre or more, it must comply with the statewide General Permit for Storm Water Discharges Associated with Construction Activity (or the San Jacinto Watershed General Permit for Storm Water Discharges Associated with Construction Activity). The project applicant shall cause the approved final project-specific WQMP to be incorporated by reference or attached to the project’s Storm Water Pollution Prevention Plan as the Post-Construction Management Plan.
- Prior to building or grading permit close-out or the issuance of a certificate of occupancy or certificate of use, the applicant shall:

⁴ Until the revised DAMP, due to be submitted to the Regional Board on January 1, 2005, has been approved by the Executive Officer, other development projects shall continue to comply with the April 1996 Supplement A to the 1993 DAMP.

- Demonstrate that all structural BMPs described in the project-specific WQMP have been constructed and installed in conformance with approved plans and specifications;
- Demonstrate that applicant is prepared to implement all non-structural BMPs described in the approved project-specific WQMP; and
- Demonstrate that an adequate number of copies of the approved project-specific WQMP are available for the future owners/occupants.

2.3 Implementation of WQMP Requirements

Co-Permittees may have several departments involved in implementing and/or administering WQMP requirements. Table 1 identifies those departments with WQMP implementation responsibility for each Co-Permittee. However, as the Co-Permittee's organizational structures are dynamic to reflect the changing needs of their jurisdictions, the assignment of these responsibilities may change. Therefore, the Co-Permittees will update this table in each Annual Report.

Prior to January 1, 2005 each Co-Permittee in the Santa Ana Region must document their procedures for implementation of the WQMP, including a description of departmental responsibilities. The Co-Permittees' documented procedures must be included in their 2004/2005 Annual Report.

Table 1. Co-Permittee Departments Responsible for Conditions of Approval and Project-Specific WQMP Review

Co-Permittee	Primary Responsibility	Secondary Responsibility
County of Riverside	Planning Department with assistance of Riverside County Flood Control & Water Conservation District	Transportation and Land Management Agency – Building and Safety Department
Beaumont	Public Works	Planning
Calimesa	Planning Department	Public Works Department
Canyon Lake	Building and Safety	Code Enforcement
Corona	Public Works Department – Land Development Section	Public Works Department – Special Projects Section (NPDES)
Hemet	Public Works Department – Development Engineering	Public Works Department
Lake Elsinore	Engineering Division	Community Services
Moreno Valley	Public Works Department – Land Development Division	Public Works Department – Enterprise Services Administration Division
Murrieta	Engineering Department	Planning Department
Norco	Engineering/Public Works Department	Planning Department
Perris	Public Works	City Engineering
Riverside	Public Works Department	Planning Department
San Jacinto	City Engineer/Public Works Inspections	Building Division/Building Inspections
Temecula	Public Works	Public Works

3.0 Projects Requiring a Project-Specific WQMP

The MS4 Permits specify the types of development that require the preparation, approval, and implementation of a project-specific WQMP. Those types of development are Significant Redevelopment and New Development (individually "Project" or collectively "Projects") represented by a map or permit for which discretionary approval is sought from a Co-Permittee. However, a Co-Permittee may require development of a WQMP for any project.

3.1 Significant Redevelopment

"Significant Redevelopment" is the addition or creation of 5,000 or more square feet of impervious surface on an existing developed site. Significant Redevelopment includes, but is not limited to, construction of additional buildings and/or structures, extension of the existing footprint of a building, and construction of impervious or compacted soil parking lots. Where Significant Redevelopment results in an increase of less than 50 percent of the existing impervious surfaces of an existing developed site, and the existing developed site received its discretionary land use approvals prior to the adoption of the WQMP, the WQMP would apply only to the addition, and not the existing development. However, if the redevelopment results in an increase of more than fifty percent of the impervious surface, then a WQMP is required for the entire development. Significant Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, the original purpose of the constructed facility or emergency actions required to protect public health and safety.

For those Significant Redevelopment projects that result in an increase of less than 50 percent of the existing impervious surfaces, the Project proponents should be encouraged to consider ways to incorporate the entire development into the WQMP to achieve possible economies of scale.

3.2 New Development

New Development is defined in the Santa Ana Region to include:

1. Residential development of 10 dwelling units or more, including single family and multi-family dwelling units, condominiums, or apartments.
2. Industrial and commercial development where the land area represented by the proposed map or permit is 100,000 square feet or more⁵, including, but not limited to, non-residential developments such as hospitals, educational institutions, recreational facilities, mini-malls, hotels, office buildings, warehouses, light industrial, and heavy industrial facilities.
3. Automotive repair shops [Standard Industrial Classification (SIC) codes⁶ 5013, 7532, 7533, 7534, 7537, 7538, and 7539].
4. Restaurants (SIC code 5812) where the project site is 5,000 square feet or more⁵.
5. Hillside development that creates 10,000 square feet or more, of impervious surface(s) including developments in areas with known erosive soil conditions or where natural slope is 25 percent or more.
6. Developments creating 2,500 square feet or more of impervious surface that is adjacent to (within 200 feet) or discharging directly into areas designated in the Basin Plan as waters supporting habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law are rare, threatened, or endangered species (denoted in the

⁵ Land area is based on acreage disturbed.

⁶ SIC codes can be searched at website <http://www.osha.gov/oshstats/sicser.html>.

Basin Plan⁷ as the “RARE” beneficial use) or waterbodies listed on the CWA Section 303(d) list of Impaired Waterbodies⁸. “Discharging directly to” means Urban Runoff from subject Development or Redevelopment site flows directly into aforementioned waterbodies. Urban Runoff is considered a direct discharge unless it first flows through a) A municipal separate storm sewer system (MS4) that has been formally accepted by and is under control and operation of a municipal entity; b) A separate conveyance system where there is co-mingling of flows with off-site sources; or c) A tributary or segment of a water body that is not designated with “RARE” beneficial uses nor listed on the 303(d) list before reaching the water body or segment designated as RARE or 303(d) listed.

7. Parking lots of 5,000 square feet or more of impervious surface exposed to Urban Runoff, where “parking lot” is defined as a site or facility for the temporary storage of motor vehicles.

3.3 Additional Requirements for Santa Margarita River Region

In the Santa Margarita Region:

Hillside Development is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development grade on any natural slope that is twenty-five percent or greater.

Additionally, in the Santa Margarita River Region the following types of development also require the preparation, approval, and implementation of a WQMP:

- Automotive repair shops also include facilities that would have SIC codes 5014, 5541, and 7536.
- Restaurants where land development is less than 5,000 square feet shall meet all WQMP requirements with the exception of structural Treatment Control BMPs and peak flow management.
- Retail gasoline outlets of 5,000 square feet or more or with projected average daily traffic of 100 or more vehicles per day.
- Parking lots with 15 or more parking spaces and potentially exposed to Urban Runoff.
- Street, roads, highways, and freeways, which includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
- Environmentally Sensitive Areas (ESAs). All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. “Directly adjacent” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.

⁷ The Basin Plan for the Santa Ana River Basin can be viewed or downloaded from website www.waterboards.ca.gov/santaana/pdf/R8BPlan.pdf and has beneficial uses for Receiving Waters listed in Chapter 3. The Basin Plan for the San Diego Basin can be viewed or downloaded from website www.waterboards.ca.gov/sandiego/programs/basinplan.html and has beneficial uses for Receiving Waters listed in Chapter 2.

⁸ The most recent CWA Section 303(d) list of Impaired Waterbodies can be found at website www.waterboards.ca.gov/tmdl/303d_lists.html.

4.0 Project-Specific WQMP Preparation

Category projects must submit a project-specific WQMP to the Co-Permittee for review and approval. Project applicants (owners and/developers) must submit a project-specific WQMP based on the template provided in Exhibit A, or other Co-Permittee approved template, that includes:

1. A project description and site characterization including preparation of a site plan and vicinity map
2. Pollutants and Hydrologic Conditions of Concern related to the project and project site
3. Site Design BMPs
4. Source Control BMPs
5. Where applicable, project-specific Treatment Control BMPs or a regional, watershed approach; including basis for selection, sizing, and incorporation of Treatment Control BMPs (where used, a watershed or regional program must be identified)
6. An operation and maintenance requirements program, including responsible entities, for BMPs
7. Proposed funding source for operations and maintenance of BMPs. Where a public agency is identified as the funding source and responsible party for BMPs, a written agreement that states acceptance of these responsibilities by the public agency must be provided.

For Projects not participating in a regional or watershed-based Treatment Control BMP program, a preliminary or final project-specific WQMP must be prepared and submitted to the Co-Permittee for review and approval in conjunction with considering any map or permit for which discretionary approval is sought.

For Projects participating in regional or watershed-based Treatment Control BMP programs, the regional or watershed-based Treatment Control BMP program may be relied upon during the discretionary review process subject to a discussion of how the project will participate in the program. However, a preliminary project-specific WQMP shall be developed, submitted and approved by the Co-Permittee concurrently with any map or permit for which discretionary approval is sought. The preliminary project-specific WQMP shall identify which pollutants and Hydrologic Conditions of Concern will be addressed by the regional or watershed-based Treatment Control BMP and any additional on-site Treatment Control BMPs that will be needed to address pollutants and Hydrologic Conditions of Concern not controlled by the regional or watershed-based facilities.

The level of detail in a preliminary project-specific WQMP submitted during the land use entitlement process will depend upon the level of detail known about the overall project design at the time project approval is sought. The preliminary project-specific WQMP must clearly identify the Co-Permittee's case number (tract number, use case number, design review number, etc.) for the project. The preliminary project-specific WQMP shall include a Site Plan (e.g., copy of the tentative map, use exhibit, or other equivalent figure) identifying the major features of the proposed project. Locations of activities, storage areas, or other features that could expose Urban Runoff to pollutants must be clearly identified on the Site Plan (e.g., map, exhibit, or figure).

A final project-specific WQMP shall be submitted and approved by the Co-Permittee prior to the issuance of any building or grading permit and the final project-specific WQMP shall be in substantial conformance with the preliminary WQMP submitted and approved by the Co-Permittee during the land use entitlement process. The final project-specific WQMP must clearly identify the Co-Permittee's case number (tract number, use case number, design review number, etc.) for the project. The final project-specific WQMP shall include a Site Plan (e.g., the approved final map, use exhibit, or other equivalent figure or figures) identifying the major features of the proposed project. Locations of activities, storage areas, or other features that could expose Urban Runoff to pollutants and locations of BMPs must be clearly identified on the Site Plan (e.g., map, exhibit, or figure).

4.1 Project Description

The project description shall completely and accurately describe in narrative form, and with supporting figures (maps or exhibits), where facilities will be located, what activities will be conducted and where, what kinds of materials will be used and/or stored, how and where materials will be delivered, and the types of wastes that will be generated. The following information shall be described, provided and/or addressed in the "Project Description" section of a project-specific WQMP:

- The name(s), address(es), and phone number(s) of the project owner, project proponent and project-specific WQMP preparer
- The project's site address, including APN number(s) and Thomas Brothers map page(s) and grids
- Planning Area/Community Name
- The watershed in which the project is located (Santa Ana or Santa Margarita) and sub-watershed (Salt Creek, San Jacinto, Warm Springs, Temescal, etc.) and Reach (found in Table 3-1 of the Water Quality Control Plan for the Santa Ana River Basin –Basin Plan)⁹
- Project site size to the nearest 0.1 acre, and the pre-project and post-project quantity (square feet or acres) and percentage of pervious to impervious surface
- Standard Industrial Classification (SIC) code for commercial or industrial projects.
- Identification of whether a Home Owners Association (HOA) or Property Owners Association (POA)¹⁰ will be formed.
- The final project-specific WQMP shall include a copy of the final conditions of approval included as an appendix
- A copy of CC&Rs for the project, if applicable, included as an appendix.
- A vicinity map showing the project site and surrounding planning areas in sufficient detail to allow project site to be plotted on a base map of the Co-Permittee.
- A site map (or maps) depicting the following project features:
 - Number and type of structures and the intended use (buildings, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.)
 - Paved areas and the intended use (parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.)
 - Landscaped areas
 - Infrastructure (streets, storm drains, etc.) that will revert to public agency ownership and operation
 - Location of existing and proposed drainage facilities (storm drains, channels, basins, etc), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated.
 - All proposed structural BMPs (source control and treatment control), their location, references to details, specifications, and product information
 - Location(s) of Receiving Waters to which the project directly or indirectly discharges

⁹ The Basin Plan for the Santa Ana River Basin can be viewed or downloaded from www.waterboards.ca.gov/santaana/pdf/RSBPJan.pdf

¹⁰ As used herein, a Home Owners Association (HOA) or Property Owners Association (POA) means a nonprofit corporation or unincorporated association created for the purpose of managing a common interest development [California Civil Code § 1351(a)].

- Location of points where onsite (or tributary offsite) flows exit the project site
- Delineation of proposed tributary areas boundaries, including tributary offsite areas, for each location where flow exits the property. Each tributary area should be clearly denoted (A, B, C, etc.)
- Pre-project and post-project topography

4.2 Site Characterization

The following information shall be addressed in the "Site Characterization" section of a project-specific WQMP:

- Current and proposed zoning or land use designation
- Current actual use of project site (undeveloped, previously developed but vacant, existing structures, etc.)
- Name(s) of Receiving Water(s)¹¹ to which the project site discharges directly or indirectly
- Identification of any 303(d) listed impairments¹² or Total Maximum Daily Loads (TMDLs)¹³ for the identified Receiving Waters.
- Designated beneficial uses for Receiving Waters to which the project site discharges, including proximity to Receiving Waters with a "RARE" beneficial use.
- If a Phase 1 environmental site assessment has been prepared for the project site, a summary of the site remediation conducted (or to be conducted) and any site use restrictions.
- If infiltration BMPs are proposed, a soils report should be included as an appendix identifying the soil type(s), infiltration capacity of the soils, and depth to groundwater.

4.3 Identify Pollutants of Concern

Potential Urban Runoff pollutants associated with the proposed project must be identified. Exhibit B to this WQMP provides brief descriptions of typical pollutants associated with Urban Runoff and a table that associates typical potential pollutants with types of development (land use). It should be noted that at the Co-Permittees discretion, the Co-Permittees may also accept updated studies from the California Association of Stormwater Quality Agencies (CASQA), USEPA, SWRCB and/or other commonly accepted agencies/associations acceptable to the Co-Permittee for determination of Pollutants of Concern associated with given land use. Additionally, in identifying Pollutants of Concern, the presence of legacy pesticides, nutrients, or hazardous substances in the site's soils as a result of past uses and their potential for exposure to Urban Runoff must be addressed in project-specific WQMPs. The Permittees should also require specific pollutants commonly associated with Urban Runoff to be considered as Pollutants of Concern for a specific project based on known problems, such as water quality standards exceedances or 303(d) impairment, in the Receiving Waters and suspected association with that land use. The list of potential Urban Runoff pollutants identified for the project must be compared with the pollutants identified as causing an impairment of Receiving Waters, if any. To identify pollutants impairing proximate Receiving Waters, each project proponent preparing a project-specific WQMP shall, at a minimum, do the following:

- a) For each of the proposed project discharge points, identify the proximate Receiving Water for each discharge point, using hydrologic unit basin numbers as identified in the most recent

¹¹ The Basin Plan for the Santa Ana River Basin can be viewed or downloaded from website www.waterboards.ca.gov/santaana/pdf/R8BPlan.pdf and has beneficial uses for Receiving Waters listed in Chapter 3. The Basin Plan for the San Diego Basin can be viewed or downloaded from website www.waterboards.ca.gov/sandiego/programs/basinplan.html and has beneficial uses for Receiving Waters listed in Chapter 2.

¹² The most recent CWA Section 303(d) list of Impaired Waterbodies can be found at website www.waterboards.ca.gov/tmdl/303d_lists.html.

¹³ Information regarding adopted TMDLs or TMDLs pending resolution can be found at website www.waterboards.ca.gov/tmdl/docs_lists.html.

version of the Water Quality Control Plan for the Santa Ana River Basin or the San Diego Basin, as appropriate.

- b) Identify each proximate Receiving Water identified above that is listed on the most recent list of Clean Water Act Section 303(d) list of impaired water bodies, which can be found at www.waterboards.ca.gov/tmdl/303d_lists.html. List all pollutants for which the proximate Receiving Waters are impaired.
- c) Compare the list of pollutants for which the proximate Receiving Waters are impaired with the potential pollutants of concern generated by the project.

The combination of Site Design BMPs, Source Control BMPs, and Treatment Control BMPs incorporated into the project plans must address the potential Pollutants of Concern identified for the project. Further, the selection of a Treatment Control BMP (or BMPs) for the project must specifically consider the effectiveness of the Treatment Control BMP for pollutants identified as causing an impairment of Receiving Waters to which the project will discharge Urban Runoff. See Section 4.5.3, BMP Selection, for additional guidance in selecting appropriate BMPs to address Pollutants of Concern.

4.4 Identify Hydrologic Conditions of Concern

Impacts to the hydrologic regime resulting from Projects may include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding the downstream channel. These changes have the potential to permanently impact downstream channels and habitat integrity.

The Permit requires that developments minimize changes to hydrology to ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion, sedimentation or stream habitat. Urban Runoff and associated impacts may be reduced by minimizing impervious surfaces and incorporating other site-design concepts that replicate or reduce impacts to the pre-development condition. The goal of these site design techniques is to achieve post development runoff flow rates, volumes, velocities and durations that prevent significant increases in downstream erosion compared to the pre-development condition and prevent significant adverse impacts to stream habitat during the 2-year and 10-year, 24-hour rainfall event. More information on maximizing onsite infiltration and minimizing impacts to stream channels can be found in Start at the Source (Bay Area Stormwater Management Agencies Association, 1999) and Low Impact Development Design Strategies, An Integrated Design Approach (Prince George's County, Maryland; Department of Environmental Resources, 1999).

Studies are currently underway (conducted by Ventura County Watershed Protection District and the Stormwater Monitoring Coalition under guidance of the Southern California Coastal Water Research Project) to determine the susceptibility of Southern California streams to excessive erosion and habitat degradation due to urbanization and to provide recommendations on methods to minimize negative impacts. In the future, the Principal Permittee may develop protective guidelines for Hydrologic Conditions of Concern for development projects, based on recommendations from these or other studies. However, until such guidelines are developed and approved, the following procedure must be followed.

A project-specific WQMP must address the issue of Hydrologic Conditions of Concern unless one of the following conditions are met:

- **Condition A:** Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4; the discharge is in full compliance with Co-Permittee requirements for connections and discharges to the MS4 (including both quality and quantity requirements); the discharge would not significantly impact stream habitat in proximate Receiving Waters; and the discharge is authorized by the Co-Permittee.

- **Condition B:** The project disturbs less than 1 acre. The disturbed area calculation should include all disturbances associated with larger common plans of development.
- **Condition C:** The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year, 24-hour rainfall events. This condition can be achieved by minimizing impervious area on a site and incorporating other site-design concepts that mimic pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the Co-Permittee.

For all other Projects, the project-specific WQMP shall demonstrate that discharge flow rates, velocities, durations, and volumes from a 2-year and 10-year, 24-hour rainfall event will not significantly impact downstream erosion or stream habitat. The project applicant shall provide sufficient information to demonstrate to the Co-Permittee that the Project will not cause significant adverse impacts, or has mitigated significant impacts to downstream erosion or stream habitat.

To comply with this requirement the Project Applicant must include an evaluation of potential of the project to cause a significant increase in downstream erosion compared to the pre-development condition and/or cause significant adverse impacts to stream habitat. Project applicants must consider the hydrology of the entire tributary watershed. Watershed plans, drainage area master plans, or other planning documents should be reviewed to the extent available, to identify the BMP requirements necessary to address cumulative impacts from Projects in the subarea of the watershed. Project applicants proposing new developments that fall into Category 1 with 20 or more units or Category 2 of section 3.2 of this WQMP shall be required to submit to the Co-Permittee a drainage study report prepared by a registered Civil Engineer in the State of California, with experience in water resources management. Other new development or redevelopment projects may be required to submit a detailed drainage study depending on specific site conditions. Such a drainage study must evaluate the impacts of the Project on downstream channel reaches impacted during a 2-year, 24-hour and 10-year, 24-hour rainfall event. A drainage study report shall also consider the Project's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and any other relevant hydrologic and environmental factors to be protected. A field reconnaissance to evaluate natural downstream reaches and/or areas containing sensitive habitat may be required to assess undercutting erosion, slope/bank stability, vegetative stress, and susceptibility to other adverse hydrologic impacts from the project.

If adverse hydrologic impacts are identified and they are not fully mitigated by the implementation of Site Design BMP concepts, then the Project proponent shall, based upon consultation with the Co-Permittee, use one of the following methodologies to address identified adverse impacts:

Methodology A

Project applicant shall design a detention basin capable of all of the following:

1. Releasing the post-development 2-year and 10-year, 24-hour volume at flow rates less than or equal to the pre-development 2-year and 10 year, 24-hour peak flow rates, respectively.
2. Passing the 100-year storm event without damage to the facility.
3. Controlling outlet velocities such that downstream erosion and habitat loss is minimized.

The basin may also function as a water quality extended detention basin, or serve other multi-use functions, with the approval of the local agency.

Methodology B

Any method acceptable to the Co-Permittee that:

1. Implements Site Design, Source Control, Treatment Control BMPs and/or other measures capable of mitigating the assessed hydrologic impacts. The method must be supported by hydrologic modeling or other sufficient documentation. Sufficient documentation could include reference to EPA, CASQA, SWRCB and/or other approved studies supporting the use of the method.
2. Ensures that the project will be consistent with any approved master plans of drainage or analogous plans or programs.

Hydrologic Condition of Concern BMPs should be designed in accordance with local vector control regulations and requirements. If a particular BMP does not meet vector control requirements, other BMPs should be considered. However, when the Co-Permittee determines that a detention basin is the most effective way to address Hydrologic Conditions of Concern, the Permittee may approve minor deviations from the design criteria specified in this section to ensure that local vector control requirements are not violated (e.g. 72 hour drain times from a basin full condition).

4.5 BMP Selection

BMPs shall be incorporated into the project-specific WQMP to minimize the impact from the Pollutants of Concern and Hydrologic Conditions of Concern identified for the Project. Where Pollutants of Concern include pollutants that are listed as causing or contributing to impairments of Receiving Waters, BMPs must be selected so that the project does not cause or contribute to an exceedance of water quality objectives. Strategies to minimize the Pollutants of Concern in runoff from the project site and minimize hydrologic impact include Site Design BMPs, Source Control BMPs, and Treatment Control BMPs. In preparing a project-specific WQMP, BMPs should be considered and incorporated into the project design plans, in the following progression:

- Site Design BMPs
- Source Control BMPs (Non-Structural and Structural)
- Treatment Control BMPs (or participation in a regional or watershed program)

Site Design BMPs aim to incorporate site features such as vegetation to reduce and control post-development runoff rates. Because Site Design BMPs reduce runoff, incorporating them into project design plans minimizes the:

- transport mechanism (runoff) for moving pollutants off site,
- difference between pre- and post-development hydrology thereby reducing changes in flow regime, and
- size of necessary Treatment Control BMPs to treat Pollutants of Concern in Urban Runoff prior to discharge from the site or at regional facilities.

Source Control BMPs reduce the potential for Urban Runoff and pollutants from coming into contact with one another. Source Control BMPs are defined as any administrative action, design of a structural facility, usage of alternative materials, and operation, maintenance, and inspection procedures that eliminate or reduce Urban Runoff pollution. Each Project is required to implement appropriate Source Control BMPs.

Treatment Control BMPs are defined as any engineered system designed and constructed to treat the adverse impacts of Urban Runoff pollution. These BMPs may remove Pollutants of Concern by filtration, media absorption, or other physical, biological, or chemical process. It should be noted that where the project proponent believes that design criteria adequately addresses Pollutants of Concern and Treatment Controls are not needed, a request for a waiver must be submitted to and approved by the Permittee.

Site Design BMPs, Source Control BMPs, and Treatment Control BMPs most effectively protect water quality when used in combination. Site Design and Source Control BMPs may be implemented to a level that significantly reduces the size or extent to which Treatment Control BMPs need to be implemented. BMPs should be located as close to the pollutant source as appropriate and economically/technologically feasible, and before Urban Runoff is discharged into Receiving Waters. A summary of the BMP requirements for New Development and Significant Redevelopment is shown in Table 2. Co-Permittees should also incorporate vector control requirements into the selection and design process of site, source and treatment control BMPs.

Table 2. Summary of BMPs for New Development & Significant Redevelopment

BMP Category		Applicable Projects
Site Design BMPs (See Section 4.5.1)		All New Development & Significant Redevelopment shall incorporate Site Design BMPs to the extent applicable and feasible.
Source Control BMPs	Non-Structural BMPs (See Section 4.5.2.1)	<p>Required for all New Development & Significant Redevelopment.</p> <ul style="list-style-type: none"> • Education/Training for Property Owners, Operators, Tenants, Occupants, or Employees • Activity Restrictions • Irrigation System and Landscape Maintenance • Common Area Litter Control • Street Sweeping Private Streets and Parking Lots • Drainage Facility Inspection and Maintenance
	Structural BMPs (See Section 4.5.2.2)	<p>Required for all New Development & Significant Redevelopment, as applicable to the specific project. Include incorporating requirements applicable to individual priority project categories</p> <ul style="list-style-type: none"> • MS4 Stenciling and Signage • Landscape and Irrigation System Design • Protection of Slopes and Channels • Provide: <ul style="list-style-type: none"> – Community Car Wash Racks – Wash Water Controls for Food Preparation Areas • Properly Design and Maintain: <ul style="list-style-type: none"> – Fueling Areas – Air/Water Supply Area Drainage – Trash Storage Areas – Loading Docks – Maintenance Bays – Vehicle and Equipment Wash Areas – Outdoor Material Storage Areas – Outdoor Work Areas or Processing Areas
Treatment Control BMPs: Project-Specific, Regional, or Sub-Regional (See Sections 4.5.3 and 5.0)		At least one Treatment Control BMP is required for all New Development and Significant Redevelopment unless a waiver is granted by Co-Permittee. (See Section 7.0)

Additional BMP reference material is contained within the CASQA “Stormwater Best Management Practices Handbook for New Development and Redevelopment” and the “Stormwater Best Management Practices Handbook for Industrial and Commercial” (CASQA, 2003). The most recent editions of the CASQA handbooks are acceptable for use in identifying and selecting BMPs for a project-specific WQMP. The most recent editions of the CASQA handbooks can be downloaded at www.cabmphandbooks.com, and supercede references in the Permit to the 1993 handbooks published by the Stormwater Quality Task Force (the predecessor of CASQA).

4.5.1 Site Design BMPs

Site Design BMPs are intended to create a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the MS4, and minimizing clearing and grading.
- Providing runoff storage measures dispersed uniformly throughout a site's landscape with the use of a variety of detention, retention, and runoff practices.
- Implementing on-lot hydrologically functional landscape design and management practices.

These same practices, because they reduce the volume and usually the rate of runoff, also have the benefit of reducing the amount of storm water that must be treated before being discharged or to be treated in regional facilities. These design principles offer an innovative approach to urban storm water management by uniformly or strategically integrating storm water controls throughout the urban landscape. Resources for applying these principles include Start at the Source (Bay Area Storm Water Management Agencies Association, 1999)¹⁴, and Low Impact Development Design Strategies, An Integrated Design Approach (Prince George's County, Maryland; Department of Environmental Resources, 1999)¹⁵.

Site Design Concept 1: Minimize Urban Runoff, Minimize Impervious Footprint, and Conserve Natural Areas

Site Design BMPs to minimize Urban Runoff, minimize impervious footprint and conserve natural areas must be incorporated where applicable as determined by the Co-Permittee during the site planning and approval process consistent with applicable General Plan policies, other development standards and regulations and with any Site Design BMPs included in an applicable regional or watershed program. Examples include:

- Maximize the permeable area. This can be achieved in various ways, including, but not limited to increasing building floor area ratio (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces. Decreasing the project's footprint can substantially reduce the project's impacts to water quality and hydrologic conditions, provided that the undeveloped area remains open space. Runoff from developed areas may be reduced by using alternative materials or surfaces with a lower Runoff Coefficient (C factor). The C factor is a representation of the ability of a surface to produce runoff. Surfaces that provide higher runoff volumes are represented by higher C factors. By incorporating more pervious, lower C factor surfaces into a development, lower volumes of runoff will be produced. Lower volumes and rates of runoff translate directly to lowering treatment requirements.
- Conserve natural areas. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. The Co-Permittees and Project applicants should refer to Multiple Species Habitat Conservation Plans or other natural resource plans, as appropriate to assist in identifying sensitive portions of the site. Sensitive areas include, but are not limited to, areas necessary to maintain the viability of wildlife corridors, occupied habitat of sensitive species and all wetlands, and coastal scrub and other upland communities.
- Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low -traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.

¹⁴ <http://www.oaklandpw.com/creeks/bmps.html>

¹⁵ <http://www.epa.gov/owow/nps/lid/lidnatl.pdf>

- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised.¹⁶
- Incorporate landscaped buffer areas between sidewalks and streets.
- Reduce widths of street where off-street parking is available.¹⁷
- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
- Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
- Use natural drainage systems.
- Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.¹⁸
- Construct onsite ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives.
- Other comparable and equally effective site design concepts as approved by the Co-Permittee.

Site Design Concept 2: Minimize Directly Connected Impervious Areas (DCIAs)

Site Design BMPs to minimize DCIAs must be incorporated where applicable, during the site planning and approval process consistent with applicable development standards and regulations and with any Site Design BMPs included in an applicable regional or watershed program. Examples include:

- Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas, where feasible.
- Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping
- Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales
- Use one or more of the following (for further guidance, see Start at the Source [1999]):
 - Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings
 - Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter
 - Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to MS4s
 - Other design concepts that are comparable and equally effective as approved by the Co-Permittee.
- Use one or more of the following features for design of driveways and private residential parking areas:
 - Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the MS4

¹⁶ Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements.

¹⁷ However, street widths must still comply with life safety requirements for fire and emergency vehicle access in addition to waste collection and facility maintenance needs.

¹⁸ However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff.

- Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the MS4
- Other design concepts that are comparable and equally effective as approved by the Co-Permittee.
- Use one or more of the following design concepts for the design of parking areas:
 - Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design
 - Overflow parking (parking stalls provided in excess of the Co-Permittee's minimum parking requirements) may be constructed with permeable paving
 - Other comparable and equally effective design concepts as approved by the Co-Permittee.
- Other comparable and equally effective design characteristics as approved by the Co-Permittee.

4.5.2 Source Control BMPs

The following Source Control BMPs must be addressed in each project-specific WQMP unless they do not apply given project features as determined by the Co-Permittee. If any of the following Source Control BMPs are not included in the project-specific WQMP, adequate justification must be provided before the project-specific WQMP will be approved.

4.5.2.1 Non-Structural Source Control BMPs

Education/Training for Property Owners, Operators, Tenants, Occupants, or Employees

For Projects with an HOA/POA of less than fifty (50) dwelling units and for Projects with no HOA/POA, practical informational materials to promote the prevention of Urban Runoff pollution will be provided by the project proponent to the first residents/occupants/tenants. These materials shall include general housekeeping practices that contribute to the protection of Urban Runoff quality and BMPs that eliminate or reduce pollution during subsequent property improvements. These materials or a resource list for obtaining these materials will be made available through the Co-Permittee or can be found at <http://www.floodcontrol.co.riverside.ca.us/YouCanHelp.asp>. However, the Co-Permittee may elect to recover printing costs for such materials. The project applicant shall request these materials at least 30 days prior to the intended distribution date and shall then be responsible for timely distribution at the time of occupancy.

For Projects with an HOA/POA of more than fifty (50) dwelling units, conditions of approval will require the HOA/POA to annually provide environmental awareness education materials to all members. These materials shall include general housekeeping practices that contribute to the protection of Urban Runoff quality and BMPs that eliminate or reduce pollution during subsequent property improvements. These materials or a resource list for obtaining these materials will be available through the Co-Permittee. However, the Co-Permittee may elect to recover printing costs for such materials. The HOA/POA shall request these materials (in writing) at least 30 days prior to the intended distribution date.

For Projects where people will be employed or contracted to perform activities that may impact Urban Runoff, BMP training and education programs must be provided to all new employees within 6 months of hire date and annually thereafter. Employee training materials may be derived from educational materials available through the Co-Permittee or from other resources such as "Stormwater Best Management Practices Handbook for Industrial and Commercial" (CASQA, 2003). The most recent editions of the CASQA handbooks can be downloaded at www.casqa.com. The project-specific WQMP must describe the frequency of employee training and indicate the party responsible for conducting the training.

Activity Restrictions

At the discretion of the Co-Permittee, if an HOA/POA is formed, the developer shall prepare CC&Rs for the purpose of Receiving Water quality protection. Alternatively, use restrictions may be developed by a building operator through lease terms, etc. These restrictions must be included in the project-specific WQMP. Examples of activity restrictions are:

- Prohibiting the blowing, sweeping, or hosing of debris (leaf litter, grass clippings, litter, etc.) into streets, storm drain inlets, or other conveyances.
- Require dumpster lids to be closed at all times.
- Prohibit vehicle washing, maintenance, or repair on the premises or restrict those activities to designated areas (such as repair within maintenance bays and vehicle washing on properly designed wash racks).

Irrigation System and Landscape Maintenance

Maintenance of irrigation systems and landscaping shall be consistent with the Co-Permittee's water conservation ordinance, which can be accessed through the Co-Permittee's website or obtained through the Co-Permittee's planning/permitting counter. Fertilizer and pesticide usage shall be consistent with the instructions contained on product labels and with regulations administered by California's Department of Pesticide Regulation. Additionally, landscape maintenance must address replacement of dead vegetation, repair of erosion rills, proper disposal of green waste, etc. Irrigation system maintenance must address periodic testing and observation of the irrigation system to detect overspray, broken sprinkler heads, and other system failures. The project-specific WQMP should describe the anticipated frequency of irrigation system and landscape maintenance activities and identify the responsible party.

Common Area Litter Control

For industrial/commercial Projects and for Projects with HOAs/POAs, the project-specific WQMP must address litter control for common areas. Litter control must address whether or not trash receptacles will be provided in common areas, emptying of trash receptacles, the frequency with which trash receptacles will be emptied, patrolling common areas and perimeter fences or walls to collect litter, noting trash disposal violations by tenants/home owners or businesses and reporting such observations to the owner, operator, manager, or HOA/POA for investigation, and identification of the party responsible for litter control.

Street Sweeping Private Streets and Parking Lots

For industrial/commercial Projects and for other Projects with HOAs/POAs, the frequency of sweeping privately owned streets shall be described in the project-specific WQMP. The frequency shall be no less than the frequency of street sweeping by the Co-Permittee on public streets. For Projects with parking lots, the parking lots shall be swept at least quarterly, including just prior to the start of the rainy season (October 1st). The project-specific WQMP should identify the anticipated sweeping frequency, source of funding and the party responsible for conducting the periodic sweeping.

Drainage Facility Inspection and Maintenance

For industrial/commercial Projects and for Projects with HOAs/POAs, the frequency for cleaning privately owned drainage facilities (catch basins, open channels and storm drain inlets) shall be described in the project-specific WQMP. The frequency shall be no less than the frequency of drainage facility cleaning conducted by the Co-Permittee. At a minimum, routine maintenance of privately owned drainage facilities should take place in the late summer or early fall prior to the start of the rainy season (October 1st). The drainage facilities must be cleaned if accumulated sediment/debris fills 25% or more of the sediment/debris storage capacity. Privately owned drainage facilities shall be inspected annually and

the cleaning frequency shall be assessed. The project-specific WQMP should identify the party responsible for conducting the drainage facility inspection and maintenance.

4.5.2.2 Structural Source Control BMPs

MS4 Stenciling and Signage

The following requirements must be addressed in a project-specific WQMP and/or shall be denoted on Project plan sheets:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language (such as: "NO DUMPING ONLY RAIN IN THE DRAIN") and/or graphical icons to discourage illegal dumping.
- Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.
- Identify the party responsible for maintaining the legibility of stencils and signs.

The stencils contain a brief statement that prohibits dumping into the MS4. Graphical icons, either illustrating anti-dumping symbols or images of Receiving Water fauna, are effective supplements to the text message. Stencils and signs alert the public to the destination of pollutants discharged into Urban Runoff.

Landscape and Irrigation System Design

A project-specific WQMP must describe how the following concepts have been incorporated into project design features:

- Employing rain shutoff devices to prevent irrigation during and after precipitation events.
- Designing irrigation systems to each landscape area's specific water requirements.
- Using flow reducers or shutoff valves triggered by a pressure drop to control water loss due to broken sprinkler heads or lines.
- The timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the MS4.
- Other comparable, equally effective, methods to reduce irrigation water runoff.
- Preparation and implementation of a landscape plan consistent with the Co-Permittee's water conservation ordinance, which may include the use of water sensors, programmable irrigation times (for short cycles), etc.
- Preparation and implementation of a landscape plan that:
 - Utilizes plants with low irrigation requirements (for example, native or drought tolerant species)
 - Groups plants with similar water requirements in order to reduce excess irrigation runoff and promote surface infiltration.
 - Use mulches (such as wood chips or shredded wood products) in planter areas without ground cover to minimize sediment in runoff.
 - Install appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant material where possible and/or as recommended by the landscape architect.
 - Maintaining or creating a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible.

- Choose plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth.

Protection of Slopes and Channels

Project plans shall include Source Control BMPs to decrease the potential for erosion of slopes and/or channels, consistent with local codes and ordinances and with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers, the Regional Boards and the California Department of Fish and Game. The following design principles shall be considered, and incorporated and implemented where determined applicable and feasible by the Co-Permittee:

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes and natural channels.
- Install permanent stabilization BMPs on disturbed slopes as quickly as possible.
- Plant slopes with native or drought tolerant vegetation. Hillside areas that are disturbed shall be landscaped with deep-rooted, drought tolerant plant species selected for erosion control.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Install permanent stabilization BMPs in channel crossings as quickly as possible, and ensure that increases in runoff velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters at the outlets of new MS4s, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to Receiving Waters.
- Onsite conveyance channels should be lined, where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are large enough to erode grass or other vegetative linings, riprap, concrete soil cement or geo-grid stabilization may be substituted or used in combination with grass or other vegetation stabilization.
- Other comparable and equally effective site design options as approved by the Co-Permittee.

Provide Community Car Wash Racks

In multi-family Projects where car washing or rinsing is not specifically prohibited via CC&Rs or other acceptable means, and in Projects having a common parking area where car washing or rinsing is not specifically prohibited via CC&Rs or other acceptable means, a designated car washing and rinsing area that does not drain directly to a MS4 shall be provided for common usage. Wash and rinse waters from this area must either be directed to the sanitary sewer (with prior approval of the sewerage agency), to an engineered filtration system, or an equally effective alternative prior to discharging to the MS4.

Properly Design Fueling Areas

Fuel dispensing areas shall include the following design features:

1. At a minimum, the fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.
2. The fuel dispensing area shall be paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete is prohibited.

3. The fuel dispensing area shall have an appropriate slope (2% - 4%) to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater and to eliminate stormwater flow through the concrete fueling area.
4. An overhanging roof structure or canopy shall be provided. The cover's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area. The cover must not drain onto the fuel dispensing area and facility downspouts (roof drains) must be routed to prevent drainage across the fueling area. The fueling area shall drain to an appropriate Treatment Control BMP prior to discharging to the MS4.
5. The fuel dispensing area must be designed to prohibit spills from draining to the street, MS4, or offsite.

Properly Design Air/Water Supply Area Drainage

Areas used for air/water supply must be graded and constructed so as to contain spilled material for cleanup.

Properly Design Trash Storage Areas

All trash container areas shall meet the following requirements:

1. Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash.
2. Trash dumpsters (containers) shall be leak proof and have attached covers or lids.
3. Connection of trash area drains to the MS4 is prohibited.
4. Trash compactors shall be roofed and set on a concrete pad. The pad shall be a minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line.

Properly Design and Maintain Loading Docks

The design of loading/unloading dock areas shall include the following:

- Cover loading dock areas, or design drainage to preclude run-on and runoff.
- Direct connections to the MS4 from below-grade loading docks (truck wells) or similar structures are prohibited. Urban Runoff from a below-grade loading dock may only be discharged to the MS4 when designed to use a Treatment Control BMP applicable to the use.

Loading docks shall be kept in a clean and orderly condition through a regular program of sweeping and litter control and immediate cleanup of spills and broken containers. Cleanup procedures should minimize or eliminate the use of water. If washdown water is used, it must be properly disposed (containment, collection, and disposal to sanitary sewer) and not discharged to the MS4. The project-specific WQMP shall describe the frequency for implementing loading dock housekeeping measures and the party responsible.

Properly Design Maintenance Bays

Maintenance bays shall include the following:

- Repair/maintenance bays shall be indoors; or, designed to preclude run-on and runoff.
- Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and washdown waters from entering the MS4. Connect drains to a sump for collection and disposal. Discharge from the repair/maintenance bays to the MS4 is prohibited.

Properly Design Vehicle and Equipment Wash Areas

The discharge of wash waters to the MS4 is prohibited. Therefore, Projects that include areas for washing/steam cleaning of vehicles or equipment shall include the following design features:

- Wash areas shall be contained and covered with a roof or overhang or adequate surplus storage to contain and utilize all precipitation.
- Provide a wash rack or wash racks connected to the sanitary sewer in accordance with sewerage agency guidelines and prior approval. The sewerage agency may require discharge monitoring. If the facility recycles wash water and is not connected to the sanitary sewer, wastes must be properly contained and disposed.
- Design an equipment wash area drainage system to capture all wash water. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around equipment wash areas to prevent wash waters from entering the MS4. Connect drains to a sump for collection and disposal.
- Surface runoff and roof drains shall be directed away from wash racks unless approved by the sanitary sewerage agency.

Properly Design Outdoor Material Storage Areas

Where plans propose outdoor storage containers for oils, fuels, solvents, coolants, wastes, and other chemicals, the areas where these materials are to be used or stored must be protected by secondary containment structures such as a low containment berm, dike, or curb, designed to the satisfaction of the Co-Permittee. Materials or products that are stored outside and that have the potential to cause pollutant discharges shall be protected from rainfall, runoff, run-on, and wind erosion by design and use of a:

- cabinet, shed, or similar structure that prevents contact with runoff or spillage to the MS4;
- paved storage area and sufficiently impervious to contain leaks and spills; and/or
- roof or awning to minimize direct precipitation and collection of stormwater within the secondary containment area. Stormwater that collects within a secondary containment structure must not be discharged to the street or the MS4.

Properly Design Outdoor Work Areas or Processing Areas

Where vehicle or equipment repair/maintenance occurs, impermeable berms, trench drains, or containment structures shall be provided around the areas to eliminate or reduce spilled materials and wash-down waters from entering the street or the MS4. Surface runoff or roof drains shall be directed away from these contained work areas. Sidewalls and canopies may be used to meet this requirement.

Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, and wastewater and solid waste handling, treatment, and disposal, and other operations shall adhere to the following requirements.

- Cover or enclose areas that would be the sources of pollutants or slope the area toward a sump.
- Grade or berm area to prevent run-on from surrounding areas.
- Storm drain inlets connected to the MS4 are prohibited within these outdoor work or process areas.
- Where wet material processing occurs (e.g. electroplating), secondary containment structures (not double wall containers) shall be provided to hold spills resulting from accidents or leaking tanks or equipment.
- Salvage yards and recycle facilities must direct all runoff to appropriate Treatment Control BMP(s).

Provide Wash Water Controls for Food Preparation Areas

Food establishments (per State Health & Safety Code 27520) shall have either contained areas or sinks, each with connections to the sanitary sewer for disposal of wash waters containing kitchen and food wastes. If located outside, the contained areas or sinks shall also be structurally covered to prevent entry of Urban Runoff. Adequate signs shall be provided and appropriately placed stating the prohibition of discharging wash water to the MS4.

4.5.3 Treatment Control BMPs

Treatment Control BMPs must be selected with respect to identified Pollutants and Hydrologic Conditions of Concern. Treatment Control BMPs must be designed to treat the Flow Based Design (Section 4.5.3.4) or the Volume Based Design (Section 4.5.3.5) from a Project. Treatment Control BMPs may also be provided offsite or through a regionally-based Treatment Control BMP (see Section 5.0).

Table 3 summarizes expected performance of several common Treatment Control BMPs in removing various Pollutants of Concern. It should be noted that, at the discretion of the Co-Permittee, updated studies from CASQA, EPA, SWRCB and/or other commonly accepted agencies/associations acceptable to the Co-Permittee for determination of Treatment Control BMP pollutant removal efficiency may be accepted. For identified Pollutants of Concern that are causing impairments in receiving waters, the Project-Specific WQMP shall incorporate one or more Treatment Control BMPs of at least medium effectiveness in reducing those pollutants.

For more specific information on the pollutant removal capabilities of various BMPs, refer to the CASQA "Stormwater Best Management Practices Handbook for New Development and Redevelopment" (CASQA, 2003). Subsequent sections of this WQMP provide guidance for determining the flow (Section 4.5.3.4) or volume (Section 4.5.3.5) of runoff from a Project to be treated via Treatment Control BMPs. The Riverside County Stormwater Quality Best Management Practice Design Handbook, which is included as Exhibit C, provides more detailed guidance.

The obligation to install Treatment Control BMPs at Project site is met if, for a common scheme of development, BMPs are constructed with the requisite capacity to serve the entire common scheme, even if certain phases of the common scheme may not have BMP capacity located on that phase. BMP capacity must be functional prior to the issuance of occupancy permits, or certificates of use (or equivalent), if no occupancy permits are issued.

If the Treatment Control BMP selected for the project functions by infiltration, the BMP shall not violate the requirements set forth in 40 CFR 144 for Class V Injection Wells¹⁹ or any potential local infiltration requirements. For purposes of identifying local infiltration requirements, the Co-Permittee will assist Project applicants in identifying groundwater management agencies that may have established such requirements. In addition, Treatment Control BMPs that allow infiltration shall not cause or contribute to an exceedance of groundwater quality objectives, shall not be used in industrial or high vehicular traffic areas (25,000 or greater average daily traffic), must be located at least 100 feet horizontally from any water supply well, must be at least 10 feet vertically above the historic high groundwater mark, and shall not cause a nuisance or pollution as defined in Water Code Section 13050.²⁰ Additional resources for the appropriate siting of infiltration BMPs include Caltrans Report No. CTSW-RT-03-025, Infiltration Basin Site Selection Study (June 2003)²¹ and USEPA Report No. EPA/600/R-94-051, Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration (1994).

¹⁹ <http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi>

²⁰ <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wat&group=13001-14000&file=13050-13051>

²¹ http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/pdfs/new_technology/CTSW-RT-03-025/IFB_Final_Report.pdf

Table 3. Treatment Control BMP Selection Matrix ⁽¹⁾

(Excerpted, with minor revision, from the Orange County Water Quality Management Plan dated September 26, 2003
and the San Bernardino Water Quality Management Plan dated April 14, 2004)

Pollutant of Concern	Biofilters ⁽²⁾	Detention Basins ⁽³⁾	Infiltration BMPs ⁽⁴⁾	Wet Ponds or Wetlands ⁽⁵⁾	Filtration Systems ⁽⁶⁾	Water Quality Inlets	Hydrodynamic Separator Systems ⁽⁷⁾	Manufactured or Proprietary Devices ⁽⁸⁾
Sediment/Turbidity	H/M	M	H/M	H/M	H/M	L	H/M (L for Turbidity)	U
Nutrients	L	M	H/M	H/M	L/M	L	L	U
Organic Compounds	U	U	U	U	H/M	L	L	U
Trash & Debris	L	M	U	U	H/M	M	H/M	U
Oxygen Demanding Substances	L	M	H/M	H/M	H/M	L	L	U
Bacteria & Viruses	U	U	H/M	U	H/M	L	L	U
Oil & Grease	H/M	M	U	U	H/M	M	L/M	U
Pesticides (non-soil bound)	U	U	U	U	U	L	L	U
Metals	H/M	M	H	H	H	L	L	U

Abbreviations:

L: Low removal efficiency

H/M: High or medium removal efficiency

U: Unknown removal efficiency

Notes:

- (1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.
- (2) Includes grass swales, grass strips, wetland vegetation swales, and bioretention.
- (3) Includes extended/dry detention basins with grass lining and extended/dry detention basins with impervious lining. Effectiveness based upon minimum 36-48-hour drawdown time.
- (4) Includes infiltration basins, infiltration trenches, and porous pavements.
- (5) Includes permanent pool wet ponds and constructed wetlands.
- (6) Includes sand filters and media filters.
- (7) Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators.
- (8) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP, or newly developed/emerging stormwater treatment technologies.

4.5.3.1 Flow Based Treatment Control BMPs**Vegetated Filter Strips**

Vegetated filter strips are uniformly graded areas of dense vegetation designed to treat sheet flow Urban Runoff. Pollutants are removed by filtering and through settling of sediment and other solid particles as the design flow passes through (not over) the vegetation. Filter strips are usually as wide as the tributary area and must be long enough in the flow direction to adequately treat the runoff. Concentrated flows are redistributed uniformly across the top of the strip with a level spreader. A grass swale, sand filter, or infiltration BMP is recommended in conjunction with a filter strip²².

Vegetated filter strips require frequent landscape maintenance. Maintenance requirements typically include grass or shrub-growing activities such as irrigation, mowing, trimming, removal of invasive species, and replanting when necessary. Consider use of duplicate facilities such that one one-half of the facility can be taken out of service to allow for maintenance without reducing the required level of

²² However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff.

treatment performance. This is especially helpful for vegetated filter strips that need to be dry before they can be mowed.

Vegetated Swales

A vegetated swale is a wide, shallow densely vegetated channel that treats Urban Runoff as it is slowly conveyed into a downstream system. These swales have very shallow slopes in order to allow maximum contact time with the vegetation. The depth of the design flow should be less than the height of the vegetation²³. Contact with vegetation improves water quality by plant uptake of pollutants, removal of sediment, and an increase in infiltration. Overall the effectiveness of grass swales is limited and they are recommended in combination with other BMPs.

Vegetated swales require a thick vegetative cover to function properly. They usually require normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. The application of fertilizers and pesticides should be minimized. Consider use of duplicate facilities such that one one-half of the facility can be taken out of service to allow for maintenance without reducing the required level of treatment performance. This is especially helpful for vegetated swales that need to be dry before they can be mowed.

Water Quality Inlet

A water quality inlet is a device that removes oil and grit from Urban Runoff before the water enters the MS4. It consists of one or more chambers that promote sedimentation of coarse materials and separation of free oil from Urban Runoff. Manufacturers have created a variety of configurations to accomplish this. A specific model can be selected from the manufacturer based on the design flow rate. A water quality inlet is generally used for pretreatment before discharging into another type of BMP.

Water quality inlet (WQI) maintenance is site-specific due to variations in sediment and hydrocarbon by-products, which may require disposal as hazardous waste. Establishment of a maintenance schedule is helpful for ensuring proper maintenance, because the WQIs are underground and can easily be neglected. High sediment loads can interfere with the ability of the WQI to effectively separate oil and grease from the runoff.

Other BMPs

In some cases, other flow-based BMPs, proprietary BMPs or combinations of BMPs may be appropriate for a development. Such BMPs or combinations of BMPs may be employed on a site-specific basis as approved by the Co-Permittee. The appropriate BMP(s) for a Project should be determined based on the size of the project area and the types of pollutants that will be found in the development runoff.

4.5.3.2 Volume Based Treatment Control BMPs

Extended Detention Basin

An extended detention Basin is a permanent basin sized to detain and slowly release the design volume of Urban Runoff, allowing particles and associated pollutants to settle out. The basin outlet is designed to slowly release this runoff over a set drawdown period. An inlet forebay section and an inlet energy dissipater minimize erosion from entering flows, while erosion protection at the outlet prevents damage from exiting flows. The bottom of the basin slopes towards the outlet at an approximate grade of two percent, and a low flow channel conveys incidental flows directly to the outlet end of the basin. The basin should be vegetated earth in order to allow some infiltration to occur, although highly pervious soils may require an impermeable liner to prevent groundwater contamination. Proper turf management is also required to ensure that the vegetation does not contribute to water pollution through pesticides, herbicides,

²³ However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff.

or fertilizers. A permanent micro-pool should not be included due to vector concerns. Extended detention basins can also be used to reduce the peaks of small run-off events for flood control purposes.

Extended detention basins require inspection semi-annually and after significant storm events to identify potential problems early. Most maintenance efforts will need to be directed toward vegetation management and vector control, which may focus on basic housekeeping practices such as removal of debris accumulations and vegetation management to ensure that the basin dewateres completely, within the set drawdown time, to prevent creating vector habitats.

Infiltration Basin

Infiltration basins perform better in well-drained permeable soils. Infiltration basins in areas of low permeability can clog within a couple of years, and require more frequent inspection and maintenance. The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Spill response procedures and controls should be implemented to prevent spills from reaching the infiltration basin. Particular care is required where the area upstream of the infiltration BMP may not be fully stabilized, or in existing developments where upstream areas may become destabilized due to construction work, lack of maintenance, fire, or other actions. In these cases, measures to prevent sediment from entering and clogging the BMP are necessary until the tributary area is stabilized. This BMP may require groundwater monitoring. Basins should not be put into operation until the upstream tributary area is stabilized.

Infiltration Trench

An infiltration trench is an excavated trench that has been refilled with a gravel and sand bed capable of holding the design volume of Urban Runoff. The runoff is stored in the trench over a period of time during which it slowly infiltrates back into the naturally pervious surrounding soil. This infiltration process effectively removes soluble and particulate pollutants, however it is not intended to trap coarse sediments. These trenches also include a bypass system for volumes greater than the design capture volume, and a perforated pipe observation well to monitor water depth.

Infiltration trenches require an effective pretreatment, such as vegetated buffer strips, to remove sediment and minimize clogging. If the trench clogs, it may be necessary to remove and replace all or part of the filter fabric and possibly the coarse aggregate. Maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to ensure that sediment does not reach the infiltration trench. Particular care is required where the area upstream of the infiltration BMP may not be fully stabilized, or in existing developments where upstream areas may become destabilized due to construction work, lack of maintenance, fire, or other actions. In these cases, measures to prevent sediment from entering and clogging the BMP are necessary until the tributary area is stabilized. Regular inspection should determine if the sediment removal structures require routine maintenance. Infiltration basins should not be put into operation until the upstream tributary area is stabilized.

Sand Filter

Sand filters clog easily when subjected to heavy sediment loads. Sediment reducing pretreatment practices, such as vegetated buffer strips or vegetated swales, placed upstream of the filter should be maintained properly to reduce sediment loads into the filter. Media filters should drain within the set drawdown time to minimize vector habitat. Maintenance will need to focus on basic housekeeping practices such as removal of debris accumulations and vegetation management (within media filter) to prevent clogs and/ or standing water. Materials such as sand, gravel, filter cloth, or filter media must be disposed of properly and in accordance with all applicable laws.

Porous Pavement

Porous Pavement is an infiltration BMP that consists of porous pavement blocks placed over a shallow recharge bed of sand and gravel. It is typically restricted to low volume parking areas that do not receive

significant offsite runoff. The modular pavement blocks allow water to seep into the recharge bed, where the sand and gravel layers percolate the design volume into the natural surrounding soils. Porous Pavement can be used for areas of up to 10 acres.

Other BMPs

In some cases, other volume-based BMPs, proprietary BMPs or combinations of BMPs may be appropriate for a development. Such BMPs or combinations of BMPs may be employed on a site-specific basis as approved by the Co-Permittee. The appropriate BMP(s) for a Project should be determined based on the size of the project area and the types of pollutants that will be found in the development runoff.

4.5.3.3 Design Basis for Treatment Control BMPs

The primary parameter for designing Treatment Control BMPs is to treat the stormwater quality design flow (Q_{BMP}) or the stormwater quality design volume (V_{BMP}) of the stormwater runoff. Table 4 lists Treatment Control BMPs and the primary design basis (flow-based or volume-based) to be used for designing BMPs.

Table 4. Design Basis for Treatment Control BMPs

Treatment Control BMP	Design Basis
Vegetated Filter Strips	Q_{BMP}
Vegetated Swales	
Water Quality Inlets	
Extended Detention Basin	V_{BMP}
Sand Filter	
Porous Pavement Detention	
Infiltration Basin	
Infiltration Trench	
Other BMPs	Q_{BMP} or V_{BMP} on Case-Specific Basis

4.5.3.4 Flow-Based Design

Flow-based BMP design standards apply to BMPs whose primary mode of pollutant removal depends on the rate of flow of runoff through the BMP. The following steps describe the approach for application of the flow-based BMP design criteria. A detailed design procedure and worksheet are provided in the Riverside County Stormwater Quality Best Management Practice Design Handbook (see Exhibit C).

- **Identify the tributary area** that drains to the proposed BMP. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, impervious areas, and runoff from off-site areas that commingle with site runoff, whether or not they are directly or indirectly connected to the BMP. Calculate this area in units of acres. Determine the impervious percentage of area in the tributary area.
- **Determine the Runoff Coefficient for each soil type** using the table included as Exhibit D for each type of soil with the site's impervious area percentage. This is based on a uniform rainfall intensity of 0.2 inch/hour.
- **Determine the percentages of each soil type** within the tributary area.
- **Determine the Site's Aggregate Runoff Coefficient** by multiplying the fraction of tributary area for each soil type by its associated Runoff Coefficient.

- **Determine the BMP Design Flow Rate** using the equation $Q_{BMP} = C \times I \times A$

Where A = Tributary Area to the BMP

I = Design Rainfall intensity, 0.2 inch/hour

C = Runoff Coefficient, based upon a Rainfall Intensity = 0.2 inch/hour

4.5.3.5 Volume-Based Design

Volume-based BMP design standards apply to BMPs whose primary mode of pollutant removal depends on the volumetric capacity of the BMP. Volume-based Treatment Control BMPs shall be designed to infiltrate or treat the design volume of runoff. Use the following steps to determine the design volume. A detailed design procedure and worksheet are provided in the Riverside County Stormwater Quality Best Management Practice Design Handbook (see Exhibit C). This method for determining the design volume is based on capturing a 24-hour 85th percentile storm event as determined using rain gages throughout Riverside County with the greatest periods of record

- **Determine the BMP Tributary Area** that drains to the proposed BMP. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, and runoff from off-site areas that commingle with site runoff, whether or not they are directly or indirectly connected to the BMP. Calculate this area in acres. Determine the impervious percentage of area in the tributary area.
- **Calculate the composite Runoff Coefficient "C-Factor"** for the BMP Tributary Area. Use the following equation based on the WEF/ASCE Method: $C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$, where i = tributary area imperviousness ratio, which is equal to the total impervious area divided by the total tributary area.
- **Determine the Unit Storage Volume** for the 85% annual runoff event by following methodology specified in the Riverside County Stormwater Quality BMP Design Handbook (see Exhibit C).
- **Calculate the required capture volume of the BMP** by multiplying the BMP Tributary Area by the Unit Storage Volume to give the BMP Design Storage Volume. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

4.5.4 Equivalent Treatment Control Alternatives

Where off-site Treatment Control BMPs are determined to be more feasible or practicable, equivalent treatment may be provided off site when approved by the Co-Permittee. Off-site Treatment Control BMPs must:

- Be located in the same watershed as the project site.
- Treat a volume and/or flow equal to or greater than the treatment volume and/or flow calculated for the project site using the guidance in this WQMP.
- Treat a pollutant loading equal to or greater than the pollutant loading from the project site.
- Address the Pollutants of Concern and Hydrologic Conditions of Concern not addressed at the project site.

Have BMP Capacity functional prior to the issuance of occupancy permits, or certificates of use (or equivalent), if no occupancy permits are issued.

- Off-site BMPs must be implemented prior to proximate Receiving Waters.
- Off-site Treatment Control BMPs shall not cause water quality impairment or contribute to an exceedance of water quality objectives.

In addition, Site Design and Source Control BMPs must continue to be implemented at the project site in accordance with this WQMP.

Subject to approval by the Co-Permittee, off-site Treatment Control BMPs with excess capacity may be used to meet the treatment needs of additional Projects as long as each Project meets the requirements of this section and such that the requirements are met when the Projects are combined. For example, if the treatment volume for Project 1 is "A" and the treatment volume for Project 2 is "B", then an off-site Treatment Control BMP would need to have a treatment volume capacity of at least "A+B" in order to treat the runoff from both Project 1 and Project 2. Similar provisions apply for flows and pollutants.

These provisions are supplemental to the provisions in Section 5 for regionally-based water quality control programs. While similar in nature, these provisions are intended to be implemented primarily on a smaller, more local basis. For example, a single developer of separate but adjacent Projects might utilize the provisions of this section to propose that controls for both Projects be located on one of the two separate sites, or possibly even propose that the controls for both sites be located on a third site.

4.6 Operation and Maintenance

Operation and maintenance (O&M) requirements for all structural Source Control and Treatment Control BMPs shall be identified in the project-specific WQMP. The project-specific WQMP shall address the following:

- Identification of each BMP that requires O&M.
- Thorough description of O&M activities, the O&M process, and the handling and placement of any wastes.
- BMP start-up dates.
- Schedule of the frequency of O&M for each BMP.
- Identification of the parties (name, address, and telephone number) responsible for O&M, including a written agreement with the entities responsible for O&M. This agreement can take the form of a Covenant and Agreement recorded by the Project Proponent with the County Recorder, HOA or POA CC&Rs, formation of a maintenance district or assessment district or other instrument sufficient to guarantee perpetual O&M. Examples of requirements for typical maintenance mechanisms and a sample of a Covenant and Agreement are available in Exhibit E and F, respectively. Project proponents should speak to the Co-Permittee for Co-Permittee specific requirements.
- Self-inspections and record-keeping requirements for BMPs (review local specific requirements regarding self-inspections and/or annual reporting), including identification of responsible parties for inspection and record-keeping.
- Thorough descriptions of water quality monitoring, if required by the Co-Permittee.
- Co-Permittees should have authority to maintain the BMP, if necessary, and invoice the owner for costs.

4.7 Funding

A funding source or sources for the O&M of each Treatment Control BMP identified in the project-specific WQMP must be identified. By certifying the project-specific WQMP (see Section 4.8), the Project applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners. One example of how to adhere to the requirement to transfer O&M responsibilities is to record the project-specific WQMP against the title to the property.

4.8 WQMP Certification

A project-specific WQMP shall include a notarized certification by the project owner/developer accepting responsibility for implementation, operation, maintenance, repair, replacement, and inspection of all BMPs described in the approved project-specific WQMP. The following certification, or a substantially similar version, shall be included in each project-specific WQMP prior to approval by the Co-Permittee. This certification statement is included in the Project-Specific WQMP Template provided in Exhibit A.

Owner's Certification

This project-specific Water Quality Management Plan (WQMP) has been prepared for [insert owner of project] by [insert name of firm preparing WQMP] for the project known as [insert street address] at [insert street address]. This WQMP is intended to comply with the requirements of the City/County of [insert City/County name] for Tract No. [insert Tract No.] /Parcel No. [insert Parcel No.], which includes the requirement for the preparation and implementation of a project-specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City/County of [insert City/County name] Water Quality Ordinance (Municipal Code Section [insert Section]).

If the undersigned transfers its interest in the subject property/project, its successor in interest the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I certify under penalty of law that the provision of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature Date

Owner's Printed Name

Owner's Title/Position

5.0 Regionally-Based Treatment Control

For watersheds, sub-watershed, tributary areas, and other areas covered by a comprehensive Master Plan of Drainage approved by the Co-Permittee(s) (or developed as part of a Master Plan of Drainage for a Specific Plan or a cooperative group of developments), regionally-based Treatment Control BMPs are an alternative approach to project-specific (onsite) Treatment Control BMP implementation. Regionally-based BMPs may provide a more effective and cost efficient runoff Treatment Control mechanism for multiple Projects within the area covered by the comprehensive master plan of drainage and water quality. Regional BMPs may also provide opportunities for public/private partnerships where pollutants of concern from existing developments within the area covered by the master plan of drainage can also be addressed by the Regional BMPs capacity.

It may be possible that a regionally-based Treatment Control BMP will address all Pollutants of Concern and Hydrologic Conditions of Concern for a particular project. The operating entity of an existing regionally based Treatment Control BMP (Regional BMP) shall be able to provide project proponents in the vicinity of the Regional BMP with information describing the tributary area the Regional BMP was designed to mitigate and the Pollutants of Concern and/or Hydrologic Conditions of Concern the Regional BMP addresses. The project proponent is responsible for identifying the Pollutants of Concern and/or Hydrologic Conditions of Concern associated with the project, comparing those with the Pollutants of Concern and/or Hydrologic Conditions of Concern addressed by the Regional BMP, and determining what additional on-site BMPs are required to treat Pollutants of Concern and/or Hydrologic Conditions of Concern not addressed by the Regional BMP.

When regionally-based Treatment Control BMPs are utilized, the Project must continue to implement Site Design and Source Control BMPs. Regionally-based Treatment Control BMPs can treat Urban Runoff from several source areas at a single or multiple downstream location(s). This approach can be effective when limited space is available for structural BMPs in Project areas. Regionally-based Treatment Control BMPs will be considered for acceptance by the Co-Permittee as an alternative to on-site measures if the Project applicant demonstrates the following (italicized requirements apply only to project proponents proposing new regionally-based BMPs):

- There is adequate capacity in the regionally-based Treatment Control BMP to address the volume-based and flow-based treatment needs of the project.
- The regionally-based Treatment Control BMP addresses the project's Pollutants of Concern (after considering Site Design and Source Control BMPs that must still be implemented at the project site).
- Projects intending to rely on the regionally-based Treatment Control BMP must incorporate Project-specific BMPs to address any pollutant of concern from the project not addressed by the regionally-based Treatment Control BMP.
- *The Project applicant identifies the party responsible for the funding, operation, maintenance, and administration of the regionally-based Treatment Control BMP.*
- The Project applicant has secured rights from the owner/operator to participate in the regionally-based BMP solution.
- The Project applicant has met all of the requirements imposed for participation in the regionally-based BMP, including funding and operation and maintenance requirements, and contingency planning.

Regional BMP capacity must be functional prior to the issuance of occupancy permits, or certificates of use (or equivalent), if no occupancy permits are issued.

- Waters of the United States will not be utilized to transport untreated Urban Runoff to the regional facility.
- The ability of the regionally-based BMP to address Total Maximum Daily Load (TMDL) requirements for any adopted TMDLs. If a regionally-based BMP does not address TMDL requirements, additional on-site BMPs may be required to address applicable TMDL related Pollutants of Concern.

Projects participating in regional Treatment Control BMPs may rely upon the regional program during the discretionary review process subject to a discussion of how the Project will participate in the program. At the discretion of the Co-Permittee(s) with jurisdiction, the Project-specific WQMP may be required to identify its Urban Runoff contribution to the regional program and how it will affect cumulative water quality impacts in the regional watershed. Removal effectiveness, cost, maintenance, and construction timing affect whether a regional-based approach is more appropriate than site-specific approaches.

Regional facilities proposed as part of the Lake Mathews Master Drainage Plan and the Retrofit Siting Study conducted by the Permittees could provide Regional Treatment for Projects. The Permittee(s) with jurisdiction over the Project should be contacted to determine if other applicable regional BMPs exist or are proposed. A Project that proposes to utilize a regional BMP must verify that the regional BMP addresses all Pollutants of Concern from the Project. A Project's Pollutants of Concern that are not addressed by the regional BMP will require a separate Treatment Control BMP (or BMPs).

6.0 Changes in Site Development or Ownership

6.1 Changes in Site Development

The WQMP must be updated to reflect significant proposed changes in the site's runoff characteristics. Potentially significant changes in the site runoff characteristics are deemed to exist whenever site work requiring a grading permit is proposed or where exterior work requiring a building permit is proposed. Under these circumstances, the owner/developer shall contact the Co-Permittee and provide sufficient information for the Co-Permittee to determine whether the existing project-specific WQMP is still appropriate. If deemed inappropriate by the Co-Permittee for proposed conditions, the owner/developer shall revise the WQMP to address the cumulative changes to the site and submit the revised project-specific WQMP to the Co-Permittee for review and approval prior to issuance of the first discretionary permit.

Significant changes in the site's runoff characteristics shall be deemed to occur whenever there is a change in use necessitating a conditional use permit (for example, changing from retail to restaurant), or when proposed changes to the site fall into one or more of the Project categories that require a project-specific WQMP. Under these conditions, a revised or completely new project-specific WQMP shall be developed and submitted for review and approval by the Co-Permittee.

6.2 Changes in Site Ownership

For sites with a fully implemented WQMP, the WQMP requirements shall transfer to all future owners of the project site. The method to ensure transferability will depend on the method of O&M specified in the WQMP. Several O&M mechanisms, including a Covenant and Agreement recorded by the Project Proponent with the County Recorder, HOA or POA CC&Rs, formation of a maintenance district or assessment district or other instrument are considered sufficient to guarantee perpetual O&M. These mechanisms can also be used to ensure transferability of the project-specific WQMP. For example, when recording the WQMP requirements against the title to the property via a Covenant and Agreement, the Covenant and Agreement can also effectively notify potential buyers and future owners of properties of their responsibilities for the WQMP. An example of a Covenant and Agreement ensuring ongoing O&M and project-specific WQMP transferability is contained in Appendix F of this WQMP. Under this agreement, new owners have the option to adopt the existing project-specific WQMP, to amend the project-specific WQMP, or to develop a new project-specific WQMP. If the project-specific WQMP is amended or if a new project-specific WQMP is developed, the amended or new project-specific WQMP must be in accordance with this WQMP, must address cumulative changes to the project site, and must be submitted to the Co-Permittee for review and approval. Similar requirements should be included as part of other O&M mechanisms or through separate agreements, if necessary.

7.0 Waiver of Treatment Control BMP Requirements

A waiver of Treatment Control BMP Requirements can be granted for any one of the following three conditions. For Conditions B and C, the Permittee must notify the appropriate Regional Water Quality Control Board of the Waiver, per the provisions of the applicable MS4 NPDES permit:

Condition A: Treatment Control BMPs may be eliminated, with the approval of the Co-Permittee, if Site Design BMPs and Source Control BMPs are demonstrated to effectively eliminate discharges of Pollutants of Concern for the Flow Based Design (Section 4.5.3.4) or Volume Based Design (Section 4.5.3.5) criteria (Design Criteria). Upon presentation of a project-specific WQMP with sufficient Site Design and Source Control BMPs to meet the WQMP Design Criteria for discharges of Pollutants of Concern, and upon specific written request by the Project Applicant for a Treatment Control Waiver, the Co-Permittee may approve a project-specific WQMP that does not include Treatment Control BMPs. The Project applicant is responsible for the presentation of evidence, potentially including but not limited to monitoring data and special studies, to support the attainment of the WQMP objectives without the use of Treatment Control BMPs.

Condition B: A Co-Permittee may waive the requirement of incorporating Treatment Control BMPs into a project-specific WQMP for Projects within those portions of the Permit Area that will not result in a discharge to Receiving Waters under the Design Criteria. Upon presentation of a project-specific WQMP with sufficient evidence of no discharge to Receiving Waters under the WQMP Design Criteria, and upon specific written request by the Project applicant for a Treatment Control Waiver, the Co-Permittee may approve a project-specific WQMP that does not include Treatment Control BMPs. The Project applicant is responsible for the presentation of evidence, potentially including but not limited to monitoring data and special studies, to support the attainment of the WQMP objectives without the use of Treatment Control BMPs. Co-Permittees shall notify the Executive Officer of the Regional Water Quality Control Board by Certified Mail (with Return Receipt) within thirty (30) calendar days after issuing a waiver. The notification shall include a copy of documentation justifying the waiver.

Condition C: The Co-Permittee may waive the requirement of incorporating Treatment Control BMPs into a project-specific WQMP on a case-by-case basis if infeasibility can be established. In considering a waiver of infeasibility, the Co-Permittees should review the CEQA documentation for the Project to determine whether a significant unmitigated impact or cumulative impact was identified that was the subject of a statement of overriding considerations. A Co-Permittee shall only grant a waiver of infeasibility when all available Treatment Control BMPs have been considered and rejected as infeasible and/or the cost of implementing Treatment Control BMPs greatly outweighs the pollution control benefit. The burden of proof is on the Project applicant to demonstrate that all available Treatment Control BMPs are infeasible. The Co-Permittee shall notify the Executive Officer of the appropriate Regional Water Quality Control Board by Certified Mail (with Return Receipt) within thirty (30) calendar days after issuing a waiver. The notification shall include a copy of the documentation justifying the waiver.

Exhibit A
Project-Specific WQMP Template

Project Specific Water Quality Management Plan

For: **Project Title**

Location Address

DEVELOPMENT NO. **TRACT, PARCEL OR OTHER ID NUMBER**
DESIGN REVIEW NO. **DESIGN REVIEW NO.**

Prepared for:

Name of Owner/Developer

Street Address

City, State Zip

Telephone: Telephone Number

Prepared by:

Name and Title of Preparer

Company Name

Street Address

City, State ZIP

Telephone: Telephone

WQMP Preparation/Revision Date: Date

OWNER'S CERTIFICATION

This project-specific Water Quality Management Plan (WQMP) has been prepared for:

Name of Owner/Developer

by Company Name for the project known as **Project Title** at **Location Address**.

This WQMP is intended to comply with the requirements of Insert City or County Name for **TRACT, PARCEL OR OTHER ID NUMBER**, which includes the requirement for the preparation and implementation of a project-specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under Insert City or County Name Water Quality Ordinance (Municipal Code Section).

If the undersigned transfers its interest in the subject property/project, its successor in interest the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

Date

Owner's Printed Name

Owner's Title/Position

Street Address
City, State Zip
Telephone Number

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APPENDICES

- A. CONDITIONS OF APPROVAL
- B. VICINITY MAP, WQMP SITE PLAN, AND RECEIVING WATERS MAP
- C. SUPPORTING DETAIL RELATED TO HYDRAULIC CONDITIONS OF CONCERN (IF APPLICABLE)
- D. EDUCATIONAL MATERIALS
- E. SOILS REPORT (IF APPLICABLE)
- F. TREATMENT CONTROL BMP SIZING CALCULATIONS AND DESIGN DETAILS
- G. AGREEMENTS – CC&RS, COVENANT AND AGREEMENTS AND/OR OTHER MECHANISMS FOR ENSURING ONGOING OPERATION, MAINTENANCE, FUNDING AND TRANSFER OF REQUIREMENTS FOR THIS PROJECT-SPECIFIC WQMP
- H. PHASE I ENVIRONMENTAL SITE ASSESSMENT – SUMMARY OF SITE REMEDIATION CONDUCTED AND USE RESTRICTIONS

Date

A-i

I. Project Description

Instructions:

The project description shall be completely and accurately described in narrative form. In the field provided on page A-3, describe and with supporting figures (maps or exhibits), where facilities will be located, what activities will be conducted and where, what kinds of materials will be used and/or stored, how and where materials will be delivered, and the types of wastes that will be generated. The following information shall be described and/or addressed in the "Project Description" section of the project-specific WQMP:

- Project owner and WQMP preparer;
 - Project location;
 - Project size;
 - Standard Industrial Classification (SIC), if applicable;
 - Location of facilities;
 - Activities and location of activities;
 - Materials Storage and Delivery Areas;
 - Wastes generated by project activities.
-

Project Owner: Name of Owner/Developer
 Street Address
 City, State Zip
 Telephone: Telephone Number

WQMP Preparer: Name and Title of Preparer
 Street Address
 City, State ZIP
 Telephone: Telephone

Date

Water Quality Management Plan (WQMP)

Project Title

Project Site Address: Insert Project Street Address
 Insert Project City, State, ZIP

Planning Area/
 Community Name/
 Development Name: Insert Planning Area / Community Name/ Development Name, if known

APN Number(s): Insert APN Number(s) - ENTER for new line

Thomas Bros. Map: Insert Thomas Bros. Map page(s) and corresponding grid(s)

Project Watershed: Enter appropriate watershed: Santa Ana, Santa Margarita or Whitewater

Sub-watershed: Enter sub-watershed and reach, from Table 3-1 of the Santa Ana River Basin - Basin Plan or from San Diego Basin Plan

Project Site Size: Insert site size (indicate to 0.1 acres)

Standard Industrial Classification (SIC) Code: Insert SIC, code, if applicable

Formation of Home Owners' Association (HOA) or Property Owners Association (POA):
 Y ☐ N ☐

Additional Permits/Approvals required for the Project

AGENCY	Permit required
State Department of Fish and Game, 1601 Streambed Alteration Agreement	Y <input type="checkbox"/> N <input type="checkbox"/>
State Water Resources Control Board, Clean Water Act (CWA) section 401 Water Quality Certification	Y <input type="checkbox"/> N <input type="checkbox"/>
US Army Corps of Engineers, CWA section 404 permit	Y <input type="checkbox"/> N <input type="checkbox"/>
US Fish and Wildlife, Endangered Species Act section 7 biological opinion	Y <input type="checkbox"/> N <input type="checkbox"/>
Other (please list in the space below as required)	

Date

Describe Project here.

Appendix A of this project-specific WQMP includes a complete copy of the final Conditions of Approval. Appendix B of this project-specific WQMP shall include:

- a. A Vicinity Map identifying the project site and surrounding planning areas in sufficient detail to allow the project site to be plotted on Co-Permittee base mapping; and
- b. A Site Plan for the project. The Site Plan included as part of Appendix B depicts the following project features:
 - Location and identification of all structural BMPs, including Treatment Control BMPs.
 - Landscaped areas.
 - Paved areas and intended uses (i.e., parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.).
 - Number and type of structures and intended uses (i.e., buildings, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.).
 - Infrastructure (i.e., streets, storm drains, etc.) that will revert to public agency ownership and operation.
 - Location of existing and proposed public and private storm drainage facilities (i.e., storm drains, channels, basins, etc.), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated.
 - Location(s) of Receiving Waters to which the project directly or indirectly discharges.
 - Location of points where onsite (or tributary offsite) flows exit the property/project site.
 - Proposed drainage areas boundaries, including tributary offsite areas, for each location where flows exits the property/project site. Each tributary area should be clearly denoted.
 - Pre- and post-project topography.

Appendix G of this project-specific WQMP shall include copies of CC&Rs, Covenant and Agreements, and/or other mechanisms used to ensure the ongoing operation, maintenance, funding, transfer and implementation of the project-specific WQMP requirements.

Date

II. Site Characterization

Land Use Designation or Zoning: Insert current and proposed zoning or land use designation

Current Property Use: Insert actual use of property (i.e., undeveloped, previously developed but vacant, etc.)

Proposed Property Use: Insert proposed use of property

Availability of Soils Report: Y ☐ N ☐ *Note: A soils report is required if infiltration BMPs are utilized. Attach report in Appendix E.*

Phase 1 Site Assessment: Y ☐ N ☐ *Note: If prepared, attached remediation summary and use restrictions in Appendix H.*

Receiving Waters for Urban Runoff from Site

Instructions:

On the following page, list in order of upstream to downstream, the receiving waters that the project is tributary to. Continue to fill each row with the receiving water's 303(d) listed impairments, designated beneficial uses, and proximity, if any, to a RARE beneficial use.

Date

Receiving Waters for Urban Runoff from Site

Receiving Waters	303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Insert name of 1st receiving water	List any 303(d) impairments of 1st receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 1st receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
insert name of 2nd receiving water	List any 303(d) impairments of 2nd receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 2nd receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
Insert name of 3rd receiving water	List any 303(d) impairments of 3rd receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 3rd receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
Insert Name Of 4th Receiving Water	List any 303(d) impairments of 4th receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 4th receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
Insert Name Of 5th Receiving Water	List any 303(d) impairments of 4th receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 4th receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
Insert Name Of 6th Receiving Water	List any 303(d) impairments of 4th receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 4th receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
Insert Name Of 7th Receiving Water	List any 303(d) impairments of 4th receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 4th receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
Insert Name Of 8th Receiving Water	List any 303(d) impairments of 4th receiving water, including TMDL pollutant limitations	Insert designated beneficial use of 4th receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)

Date

III. Pollutants of Concern

Potential pollutants associated with Urban Runoff from the proposed project must be identified. Exhibit B of the WQMP provides brief descriptions of typical pollutants associated with Urban Runoff and a table that associates typical potential pollutants with types of development (land use). It should be noted that at the Co-Permittees discretion, the Co-Permittees may also accept updated studies from the California Association of Stormwater Quality Agencies (CASQA), USEPA, SWRCB and/or other commonly accepted agencies/associations acceptable to the Co-Permittee for determination of Pollutants of Concern associated with given land use. Additionally, in identifying Pollutants of Concern, the presence of legacy pesticides, nutrients, or hazardous substances in the site's soils as a result of past uses and their potential for exposure to Urban Runoff must be addressed in project-specific WQMPs. The Co-Permittee may also require specific pollutants commonly associated with urban runoff to be addressed based on known problems in the watershed. The list of potential Urban Runoff pollutants identified for the project must be compared with the pollutants identified as causing an impairment of Receiving Waters, if any. To identify pollutants impairing proximate Receiving Waters, each project proponent preparing a project-specific WQMP shall, at a minimum, do the following:

- a. For each of the proposed project discharge points, identify the proximate Receiving Water for each discharge point, using hydrologic unit basin numbers as identified in the most recent version of the Water Quality Control Plan for the Santa Ana River Basin or the San Diego Region.
- b. Identify each proximate identified above that is listed on the most recent list of Clean Water Act Section 303(d) list of impaired water bodies, which can be found at website www.swrcb.ca.gov/tmdl/303d_lists.html. List all pollutants for which the proximate Receiving Waters are impaired.
- c. Compare the list of pollutants for which the proximate Receiving Waters are impaired with the pollutants expected to be generated by the project.

Urban Runoff Pollutants: Insert potential stormwater pollutants associated with project type as presented in Exhibit B of Riverside County WQMP. Additionally, any other potential stormwater pollutants that are project-specific must also be identified.

Date

IV. Hydrologic Conditions of Concern

Impacts to the hydrologic regime resulting from the Project may include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding the downstream channel. These changes have the potential to permanently impact downstream channels and habitat integrity. A change to the hydrologic regime of a Project's site would be considered a hydrologic condition of concern if the change would have a significant impact on downstream erosion compared to the pre-development condition or have significant impacts on stream habitat, alone or as part of a cumulative impact from development in the watershed.

This project-specific WQMP must address the issue of Hydrologic Conditions of Concern unless one of the following conditions are met:

- **Condition A:** Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4; the discharge is in full compliance with Co-Permittee requirements for connections and discharges to the MS4 (including both quality and quantity requirements); the discharge would not significantly impact stream habitat in proximate Receiving Waters; and the discharge is authorized by the Co-Permittee.
- **Condition B:** The project disturbs less than 1 acre. The disturbed area calculation should include all disturbances associated with larger plans of development.
- **Condition C:** The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year 24-hour rainfall events. This condition can be achieved by minimizing impervious area on a site and incorporating other site-design concepts that mimic pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the Co-Permittee.

This Project meets the following condition: INSERT CONDITION A, CONDITION B, CONDITION C, OR NONE. IF NONE, REFER TO SECTION 4.4 OF RIVERSIDE COUNTY WQMP FOR ADDITIONAL REQUIREMENTS.

Supporting engineering studies, calculations, and reports are included in Appendix C.

	2 year – 24 hour		10 year – 24 hour	
	Precondition	Post-condition	Precondition	Post-condition
Discharge (cfs)	INSERT VALUE	INSERT VALUE	INSERT VALUE	INSERT VALUE
Velocity (fps)	INSERT VALUE	INSERT VALUE	INSERT VALUE	INSERT VALUE
Volume (cubic feet)	INSERT VALUE	INSERT VALUE	INSERT VALUE	INSERT VALUE
Duration (minutes)	INSERT VALUE	INSERT VALUE	INSERT VALUE	INSERT VALUE

Date

V. Best Management Practices

V.1 SITE DESIGN BMPs

Project proponents shall implement Site Design concepts that achieve each of the following:

- 1) Minimize Urban Runoff
- 2) Minimize Impervious Footprint
- 3) Conserve Natural Areas
- 4) Minimize Directly Connected Impervious Areas (DCIAs)

The project proponent should identify the specific BMPs implemented to achieve each Site Design concept and provide a brief explanation for those Site Design concepts considered not applicable.

Instructions:

In field below, provide narrative describing which site design concepts were incorporated into project plans. If the project proponent implements a Co-Permittee approved alternative or equally-effective Site Design BMP not specifically described below, the Site Design BMP checkbox in Table 1 should be marked and an additional description indicating the nature of the BMP and how it addresses the Site Design concept should be provided. Continue with completion of Table 1.

Note: The Co-Permittees general plan or other land use regulations/documents may require several measures that are effectively site design BMPs (such as minimization of directly connected impervious areas and/or setbacks from natural stream courses). The Project Proponent should work with Co-Permittee staff to determine if those requirements may be interpreted as site design BMPs for use in this table/narrative. See Section 4.5.1 of the WQMP for additional guidance on Site Design BMPs.

*Following Table 1: if a particular Site Design BMP concept is found to be not applicable, please provide a brief explanation as to why the concept cannot be implemented. Also include descriptions explaining how each **included** BMP will be implemented. In those areas where Site Design BMPs require ongoing maintenance, the inspection and maintenance frequency, the inspection criteria, and the entity or party responsible for implementation, maintenance, and/or inspection shall be described. The location of each Site Design BMP must also be shown on the WQMP Site Plan included in Appendix B.*

Insert text here describing site design concepts incorporated into project plans.

Date

Table 1. Site Design BMPs

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
Site Design Concept 1	Minimize Urban Runoff	Maximize the permeable area (See Section 4.5.1 of the WQMP).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Incorporate landscaped buffer areas between sidewalks and streets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use natural drainage systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Construct onsite ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required to describe BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date

Table 1. Site Design BMPs (Cont.)

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
Site Design Concept 2	Minimize Impervious Footprint	Maximize the permeable area (See Section 4.5.1 of the WQMP).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low -traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Reduce widths of street where off-street parking is available.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Design Concept 3	Conserve Natural Areas	Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Conserve natural areas (See WQMP Section 4.5.1).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use natural drainage systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date

Table 1. Site Design BMPs (Cont.)

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
Site Design Concept 4	Minimize Directly Connected Impervious Areas (DCIAs)	Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas, where feasible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to MS4s.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the MS4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface, or designed to drain into landscaping prior to discharging to the MS4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Overflow parking (parking stalls provided in excess of the Co-Permittee's minimum parking requirements) may be constructed with permeable paving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Other comparable and equally effective design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Non-applicable Site Design BMPs:

Insert text here describing why a particular Site Design BMP concept found to be not-applicable cannot be implemented.

Date

Project Site Design BMPs:

Insert text here describing how each included Site Design BMP will be implemented.

Date

V.2 SOURCE CONTROL BMPs

Instructions: Complete Table 2.

Table 2. Source Control BMPs

BMP Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	<input type="checkbox"/>	<input type="checkbox"/>	
Activity Restrictions	<input type="checkbox"/>	<input type="checkbox"/>	
Irrigation System and Landscape Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	
Common Area Litter Control	<input type="checkbox"/>	<input type="checkbox"/>	
Street Sweeping Private Streets and Parking Lots	<input type="checkbox"/>	<input type="checkbox"/>	
Drainage Facility Inspection and Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	
Structural Source Control BMPs			
MS4 Stenciling and Signage	<input type="checkbox"/>	<input type="checkbox"/>	
Landscape and Irrigation System Design	<input type="checkbox"/>	<input type="checkbox"/>	
Protect Slopes and Channels	<input type="checkbox"/>	<input type="checkbox"/>	
Provide Community Car Wash Racks	<input type="checkbox"/>	<input type="checkbox"/>	
Properly Design:	<input type="checkbox"/>	<input type="checkbox"/>	
Fueling Areas	<input type="checkbox"/>	<input type="checkbox"/>	
Air/Water Supply Area Drainage	<input type="checkbox"/>	<input type="checkbox"/>	
Trash Storage Areas	<input type="checkbox"/>	<input type="checkbox"/>	
Loading Docks	<input type="checkbox"/>	<input type="checkbox"/>	
Maintenance Bays	<input type="checkbox"/>	<input type="checkbox"/>	
Vehicle and Equipment Wash Areas	<input type="checkbox"/>	<input type="checkbox"/>	
Outdoor Material Storage Areas	<input type="checkbox"/>	<input type="checkbox"/>	
Outdoor Work Areas or Processing Areas	<input type="checkbox"/>	<input type="checkbox"/>	
Provide Wash Water Controls for Food Preparation Areas	<input type="checkbox"/>	<input type="checkbox"/>	

Instructions: Provide narrative below describing how each **included** BMP will be implemented, the implementation frequency, inspection and maintenance frequency, inspection criteria, and the entity or party responsible for implementation, maintenance, and/or inspection. The location of each structural BMP must also be shown on the WQMP Site Plan included in Appendix B.

Insert text here as instructed above.

Appendix D includes copies of the educational materials that will be used in implementing this project-specific WQMP.

Date

V.3 TREATMENT CONTROL BMPs

Instructions:

1. Provide narrative below describing each Treatment Control BMP. Include location, identify the sizing criteria [i.e., Urban Runoff quality design flow (QBMP) or the Urban Runoff quality design volume (VBMP), preliminary design calculations, for sizing BMPs, maintenance procedures, and the frequency of maintenance procedures necessary to sustain BMP effectiveness. The location of each Treatment Control BMP must also be shown on the Site Plan included in Appendix B.
2. Complete Table 3: Treatment Control BMP Selection Matrix

Directions for completing Table 3:

- ◆ For each pollutant of concern enter "yes" if identified using Exhibit B (Riverside County WQMP - General Categories of Pollutants of Concern per the instructions specified in Section III of this Template), or "no" if not identified for the project.
 - ◆ Check the boxes of selected BMPs that will be implemented for the project to address each pollutant of concern from the project as identified using Exhibit B. Treatment Control BMPs must be selected and installed with respect to identified pollutant characteristics and concentrations that will be discharged from the site.
 - ◆ For any identified pollutants of concern not listed in the Treatment Control BMP Selection Matrix, provide an explanation (in space below) of how they will be addressed by Treatment Control BMPs.
3. In addition to completing Table 3, provide detailed descriptions on the location, implementation, installation, and long-term O&M of planned Treatment Control BMPs.

For identified pollutants of concern that are causing an impairment in receiving waters, the project WQMP shall incorporate one or more Treatment Control BMPs of medium or high effectiveness in reducing those pollutants. It is the responsibility of the project proponent to demonstrate, and document in the project WQMP, that all pollutants of concern will be fully addressed. The Agency may require information beyond the minimum requirements of this WQMP to demonstrate that adequate pollutant treatment is being accomplished.

Supporting engineering calculations for Q_{BMP} and/or V_{BMP} , and Treatment Control BMP design details are included in Appendix F.

Note: Projects that will utilize infiltration-based Treatment Control BMPs (e.g., Infiltration Basins, Infiltration Trenches, Porous Pavement) must include a copy of the property/project soils report as Appendix E to the project-specific WQMP. The selection of a Treatment Control BMP (or BMPs) for the project must specifically consider the effectiveness of the Treatment Control BMP for pollutants identified as causing an impairment of Receiving Waters to which the project will discharge Urban Runoff.

Insert text describing Treatment Control BMPs as instructed above.

Date

Table 3: Treatment Control BMP Selection Matrix

Pollutant of Concern	Treatment Control BMP Categories ⁽³⁾							
	Veg. Swale /Veg. Filter Strips	Detention Basins ⁽²⁾	Infiltration Basins & Trenches/Porous Pavement ⁽³⁾⁽¹⁰⁾	Wet Ponds or Wetlands	Sand Filter or Filtration	Water Quality Inlets	Hydrodynamic Separator Systems ⁽⁴⁾	Manufactured/ Proprietary Devices
Sediment/Turbidity Y <input type="checkbox"/> N <input type="checkbox"/>	H/M <input type="checkbox"/>	M <input type="checkbox"/>	H/M <input type="checkbox"/>	H/M <input type="checkbox"/>	H/M <input type="checkbox"/>	L <input type="checkbox"/>	H/M (L for turbidity) <input type="checkbox"/>	U <input type="checkbox"/>
Nutrients Y <input type="checkbox"/> N <input type="checkbox"/>	L <input type="checkbox"/>	M <input type="checkbox"/>	H/M <input type="checkbox"/>	H/M <input type="checkbox"/>	L/M <input type="checkbox"/>	L <input type="checkbox"/>	L <input type="checkbox"/>	U <input type="checkbox"/>
Organic Compounds Y <input type="checkbox"/> N <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	H/M <input type="checkbox"/>	L <input type="checkbox"/>	L <input type="checkbox"/>	U <input type="checkbox"/>
Trash & Debris Y <input type="checkbox"/> N <input type="checkbox"/>	L <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	H/M <input type="checkbox"/>	M <input type="checkbox"/>	H/M <input type="checkbox"/>	U <input type="checkbox"/>
Oxygen Demanding Substances Y <input type="checkbox"/> N <input type="checkbox"/>	L <input type="checkbox"/>	M <input type="checkbox"/>	H/M <input type="checkbox"/>	H/M <input type="checkbox"/>	H/M <input type="checkbox"/>	L <input type="checkbox"/>	L <input type="checkbox"/>	U <input type="checkbox"/>
Bacteria & Viruses Y <input type="checkbox"/> N <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	H/M <input type="checkbox"/>	U <input type="checkbox"/>	H/M <input type="checkbox"/>	L <input type="checkbox"/>	L <input type="checkbox"/>	U <input type="checkbox"/>
Oils & Grease Y <input type="checkbox"/> N <input type="checkbox"/>	H/M <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	H/M <input type="checkbox"/>	M <input type="checkbox"/>	L/M <input type="checkbox"/>	U <input type="checkbox"/>
Pesticides (non-soil bound) Y <input type="checkbox"/> N <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	U <input type="checkbox"/>	L <input type="checkbox"/>	L <input type="checkbox"/>	U <input type="checkbox"/>
Metals Y <input type="checkbox"/> N <input type="checkbox"/>	H/M <input type="checkbox"/>	M <input type="checkbox"/>	H <input type="checkbox"/>	H <input type="checkbox"/>	H <input type="checkbox"/>	L <input type="checkbox"/>	L <input type="checkbox"/>	U <input type="checkbox"/>

Date

Water Quality Management Plan (WQMP)
Project Title

Abbreviations:

L: Low removal efficiency H/M: High or medium removal efficiency U: Unknown removal efficiency

Notes:

- (1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.
- (2) Includes grass swales, grass strips, wetland vegetation swales, and bioretention.
- (3) Includes extended/dry detention basins with grass lining and extended/dry detention basins with impervious lining. Effectiveness based upon minimum 36-48-hour drawdown time.
- (4) Includes infiltration basins, infiltration trenches, and porous pavements.
- (5) Includes permanent pool wet ponds and constructed wetlands.
- (6) Includes sand filters and media filters.
- (7) Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators.
- (8) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP, or newly developed/emerging stormwater treatment technologies.
- (9) Project proponents should base BMP designs on the Riverside County Stormwater Quality Best Management Practice Design Handbook. However, project proponents may also wish to reference the California Stormwater BMP Handbook – New Development and Redevelopment (www.cabmphandbooks.com). The Handbook contains additional information on BMP operation and maintenance.
- (10) Note: Projects that will utilize infiltration-based Treatment Control BMPs (e.g., Infiltration Basins, Infiltration Trenches, Porous Pavement) must include a copy of the property/project soils report as Appendix E to the project-specific WQMP. The selection of a Treatment Control BMP (or BMPs) for the project must specifically consider the effectiveness of the Treatment Control BMP for pollutants identified as causing an impairment of Receiving Waters to which the project will discharge Urban Runoff.

V.4 EQUIVALENT TREATMENT CONTROL ALTERNATIVES

Insert Text or state "Not applicable." Note: The WQMP Preparer should refer to Section 4.5.4 of the Riverside County WQMP

V.5 REGIONALLY-BASED TREATMENT CONTROL BMPs

Insert Text or state "Not applicable." Note: The WQMP Preparer should refer to Section 6.0 of the Riverside County WQMP.

Date

VI. Operation and Maintenance Responsibility for Treatment Control BMPs

Operation and maintenance (O&M) requirements for all structural Source Control and Treatment Control BMPs shall be identified in the project-specific WQMP. The project-specific WQMP shall address the following:

- Identification of each BMP that requires O&M.
- Thorough description of O&M activities, the O&M process, and the handling and placement of any wastes.
- BMP start-up dates.
- Schedule of the frequency of O&M for each BMP.
- Identification of the parties (name, address, and telephone number) responsible for O&M, including a written agreement with the entities responsible for O&M. This agreement can take the form of a Covenant and Agreement recorded by the Project Proponent with the County Recorder, HOA or POA CC&Rs, formation of a maintenance district or assessment district or other instrument sufficient to guarantee perpetual O&M. The preparer of this project-specific WQMP should carefully review Section 4.6 of the WQMP prior to completing this section of the project-specific WQMP.
- Self-inspections and record-keeping requirements for BMPs (review local specific requirements regarding self-inspections and/or annual reporting), including identification of responsible parties for inspection and record-keeping.
- Thorough descriptions of water quality monitoring, if required by the Co-Permittee.

Instructions: Identify below all operations and maintenance requirements, as described above, for each structural BMP. Where a public agency is identified as the funding source and responsible party for a Treatment Control BMP, a copy of the written agreement stating the public agency's acceptance of these responsibilities must be provided in Appendix G.

Insert text as instructed above.

Date

7.1.1.1.1.1 Funding

A funding source or sources for the O&M of each Treatment Control BMP identified in the project-specific WQMP must be identified. By certifying the project-specific WQMP, the Project applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners. One example of how to adhere to the requirement to transfer O&M responsibilities is to record the project-specific WQMP against the title to the property.

Insert text identifying the funding source or sources for the operation and maintenance of each Treatment Control BMP included in the project.

Date

Appendix A

Conditions of Approval

Planning Commission Resolution _____

Dated _____

Appendix B

Vicinity Map, WQMP Site Plan, and Receiving Waters Map

Appendix C

Supporting Detail Related to Hydraulic Conditions of Concern

Appendix D

Educational Materials

Appendix E

Soils Report

Appendix F

Treatment Control BMP Sizing Calculations and Design Details

Appendix G

AGREEMENTS – CC&Rs, COVENANT AND AGREEMENTS AND/OR
OTHER MECHANISMS FOR ENSURING ONGOING
OPERATION, MAINTENANCE, FUNDING AND TRANSFER
OF REQUIREMENTS FOR THIS PROJECT-SPECIFIC
WQMP

Appendix H

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT – SUMMARY OF SITE REMEDATION CONDUCTED AND USE RESTRICTIONS

Exhibit B

General Categories of Pollutants of Concern

General Categories of Pollutants of Concern

- **Pathogens** – Pathogens (bacteria and viruses) are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
- **Metals** – The primary source of metal pollution in Urban Runoff is typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. Metals are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. At low concentrations naturally occurring in soil, metals may not be toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.
- **Nutrients** – Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in Urban Runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
- **Pesticides** – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive or improper application of a pesticide may result in runoff containing toxic levels of its active ingredient.
- **Organic Compounds** – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to the MS4. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
- **Sediments** – Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
- **Trash and Debris** – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. In addition, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.
- **Oxygen-Demanding Substances** – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins,

carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.

- **Oil and Grease** – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

Potential Pollutants Generated by Land Use Type

(Excerpted, with minor revision, from the San Bernardino Water Quality Management Plan dated April 14, 2004)

Type of Development (Land Use)	Sediment/ Turbidity	Nutrients	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Bacteria & Viruses	Oil & Grease	Pesticides	Metals
Detached Residential Development	P	P	N	P	P	P	P	P	N
Attached Residential Development	P	P	N	P	P ⁽¹⁾	P	P ⁽²⁾	P	N
Commercial/ Industrial Development	P ⁽¹⁾	P ⁽¹⁾	P ⁽⁵⁾	P	P ⁽¹⁾	P ⁽³⁾	P	P ⁽¹⁾	P
Automotive Repair Shops	N	N	P ^(4,5)	P	N	N	P	N	P
Restaurants	N	N	N	P	P	P	P	N	N
Hillside Development	P	P	N	P	P	P	P	P	N
Parking Lots	P ⁽¹⁾	P ⁽¹⁾	P ⁽⁴⁾	P	P ⁽¹⁾	P ⁽⁶⁾	P	P ⁽¹⁾	P
Streets, Highways & Freeways	P	P ⁽¹⁾	P ⁽⁴⁾	P	P ⁽¹⁾	P ⁽⁶⁾	P	P ⁽¹⁾	P

Abbreviations:

P = Potential N = Not potential

Notes:

- (1) A potential pollutant if landscaping or open area exists on the Project site.
- (2) A potential pollutant if the project includes uncovered parking areas.
- (3) A potential pollutant if land use involves animal waste.
- (4) Specifically, petroleum hydrocarbons.
- (5) Specifically, solvents.
- (6) Bacterial indicators are routinely detected in pavement runoff.

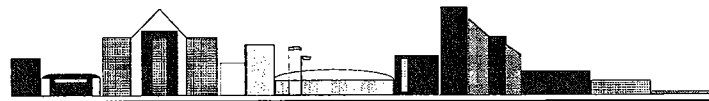
Exhibit C

Riverside County
Stormwater Quality Best Management Practice
Design Handbook

Riverside County

Stormwater Quality Best Management Practice

Design Handbook



Riverside County Flood Control and Water Conservation District

1995 Market Street

Riverside CA 92501

July 21, 2006

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BMP Design Criteria

Introduction

The purpose of this handbook is to provide design procedures for structural Best Management Practices (BMPs) for new development and redevelopment within Riverside County. This report expands on the BMP information given in the Attachment to Supplement A of the Riverside County DAMP (1996). Design procedures are based on guidance manuals from Ventura County (2002) and the City of Modesto (2001) with some criteria taken from the California BMP Handbook (2003). These sources were found to give the most detailed and clear design steps for the BMPs listed in the Attachment. BMP design concepts were combined and adapted to provide a straightforward method for designing BMPs within Riverside County.

This handbook considers the seven types of BMPs listed in the Attachment in addition to extended detention basins. In some cases, variations or combination of these BMPs or the use of other BMPs (such as proprietary BMPs) may be more appropriate for a development. BMP selection will depend on the size of the project area and the types of pollutants to be treated. Once the BMP(s) has been selected, design guidelines are governed by either volume or flow criteria. Table 1 lists the BMPs and the design parameter that they are governed by.

Table 1: BMP Design Basis

BMP Type	Volume-Based Design	Flow-Based Design
Extended Detention Basins	X	
Infiltration Basins	X	
Infiltration Trenches	X	
Porous Pavement	X	
Sand Filters	X	
Grass Swales		X
Filter Strips		X
Water Quality Inlets		X

In order to meet NPDES regulations, the design volume or design flow to be treated must reduce pollutants to the Maximum Extent Practicable (MEP). The standard is the maximum extent possible taking into account equitable consideration and competing facts, including but not limited to: public health risk, environmental benefits, pollutant removal effectiveness, regulatory compliance, public acceptance, implementability, cost and technical feasibility. The methods used in this handbook for determining design volumes and flow, are based on studies from the ASCE Manual of Practice No. 87 (1998) and the California BMP Handbook respectively. These methods meet the criteria established by the Santa Ana, San Diego, and Colorado River Basin Regional Water Quality Control Boards (RWQCB) that have jurisdiction within Riverside County.

To ensure long-term performance of the BMPs, ongoing and proper maintenance should be considered. Proof of a viable maintenance mechanism may be required prior to plan approval. Some information on cost and maintenance considerations may be found at the EPA internet site (www.epa.gov) under their NPDES/Stormwater page.

BMP Selection

Different types of development result in different types of stormwater pollution. Most BMPs only treat some of these pollutants. To effectively protect water quality, the BMP(s) selected for a project must treat each of the project's identified pollutants. Table 2 identifies potential pollutants based on the type of development proposed. Table 3 can be used to select BMPs to treat these pollutants.

Table 2: Potential Pollutants Generated by Land Use Type

(Excerpted, with minor revision, from the San Bernardino Water Quality Management Plan dated April 14, 2004)

Type of Development (Land Use)	Sediment/ Turbidity	Nutrients	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Bacteria & Viruses	Oil & Grease	Pesticides	Metals
Detached Residential Development	P	P	N	P	P	P	P	P	N
Attached Residential Development	P	P	N	P	P ⁽¹⁾	P	P ⁽²⁾	P	N
Commercial/ Industrial Development	P ⁽¹⁾	P ⁽¹⁾	P ⁽⁵⁾	P	P ⁽¹⁾	P ⁽³⁾	P	P ⁽¹⁾	P
Automotive Repair Shops	N	N	P ^(4,5)	P	N	N	P	N	P
Restaurants	N	N	N	P	P	P	P	N	N
Hillside Development	P	P	N	P	P	P	P	P	N
Parking Lots	P ⁽¹⁾	P ⁽¹⁾	P ⁽⁴⁾	P	P ⁽¹⁾	P ⁽⁶⁾	P	P ⁽¹⁾	P
Streets, Highways & Freeways	P	P ⁽¹⁾	P ⁽⁴⁾	P	P ⁽¹⁾	P ⁽⁶⁾	P	P ⁽¹⁾	P

Abbreviations:

P = Potential N = Not potential

Notes:

- (1) A potential pollutant if landscaping or open area exists on the Project site.
- (2) A potential pollutant if the project includes uncovered parking areas.
- (3) A potential pollutant if land use involves animal waste.
- (4) Specifically, petroleum hydrocarbons.
- (5) Specifically, solvents.
- (6) Bacterial indicators are routinely detected in pavement runoff.

Table 3: Treatment Control BMP Selection Matrix⁽¹⁾

(Excerpted, with minor revision, from the Orange County Water Quality Management Plan dated September 26, 2003
and the San Bernardino Water Quality Management Plan dated April 14, 2004)

Pollutant of Concern	Biofilters ⁽²⁾	Detention Basins ⁽³⁾	Infiltration BMPs ⁽⁴⁾	Wet Ponds or Wetlands ⁽⁵⁾	Filtration Systems ⁽⁶⁾	Water Quality Inlets	Hydrodynamic Separator Systems ⁽⁷⁾	Manufactured or Proprietary Devices ⁽⁸⁾
Sediment/Turbidity	H/M	M	H/M	H/M	H/M	L	H/M (L for Turbidity)	U
Nutrients	L	M	H/M	H/M	L/M	L	L	U
Organic Compounds	U	U	U	U	H/M	L	L	U
Trash & Debris	L	M	U	U	H/M	M	H/M	U
Oxygen Demanding Substances	L	M	H/M	H/M	H/M	L	L	U
Bacteria & Viruses	U	U	H/M	U	H/M	L	L	U
Oil & Grease	H/M	M	U	U	H/M	M	L/M	U
Pesticides (non-soil bound)	U	U	U	U	U	L	L	U
Metals	H/M	M	H	H	H	L	L	U

Abbreviations:

L: Low removal efficiency

H/M: High or medium removal efficiency

U: Unknown removal efficiency

Notes:

- (1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.
- (2) Includes grass swales, grass strips, wetland vegetation swales, and bioretention.
- (3) Includes extended/dry detention basins with grass lining and extended/dry detention basins with impervious lining. Effectiveness based upon minimum 36-48-hour drawdown time.
- (4) Includes infiltration basins, infiltration trenches, and porous pavements.
- (5) Includes permanent pool wet ponds and constructed wetlands.
- (6) Includes sand filters and media filters.
- (7) Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators.
- (8) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP, or newly developed/emerging stormwater treatment technologies.

Volume Based BMPs

General

The largest concentrations of pollutants are found in runoff from small volume storms and from the first flush of larger storms. Therefore, volume based BMPs should be sized to capture and treat the initial and more frequent runoff surges that convey the greatest concentration of pollutants. To maximize treatment and avoid health hazards, volume-based BMPs must retain and release the runoff between a 24 and 72 hour period. This handbook typically recommends a draw down time of 48 hours, as recommended by the California BMP Handbook. The drawdown time refers to the minimum amount of time the design volume must be retained.

In order to meet RWQCB requirements, the method for determining the design volume is based on capturing 85 percent of the total annual runoff. These 85 percent capture values were determined throughout Riverside County using rain gages with the greatest periods of record. Key model assumptions are based on studies used in the *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998)* and the *California Best Management Practice Handbook*. This handbook gives a simple procedure for determining the design volume of a BMP based on the location of the project.

BMP Design Volume Calculations

Following is a step-by-step procedure for determining design volume for BMPs using Worksheet

1. Examples of the following procedure can be found in Appendix B.

1. Create Unit Storage Volume Graph:

- a) Locate the project site on the Slope of the Design Volume Curve contained in Appendix A.
- b) Read the slope value at this location. This value is the Unit Storage Volume for a runoff coefficient of 1.0.
- c) Plot this value as a point (corresponding to a coefficient of 1.0) on the Unit Storage Volume Graph shown on Figure 2.
- d) Draw a straight line from this point to the origin, to create the graph.

2. Determine the runoff coefficient (C) from Figure 1 or the following relationship:

$$C = .858i^3 - .78i^2 + .774i + .04$$

where i = impervious percentage

3. Using the runoff coefficient found in step 2, determine 85th percentile unit storage volume (V_u) using Figure 2 (created in step 1).
4. Determine the design storage volume (V_{BMP}). This is the volume to be used in the design of selected BMPs presented in this handbook.

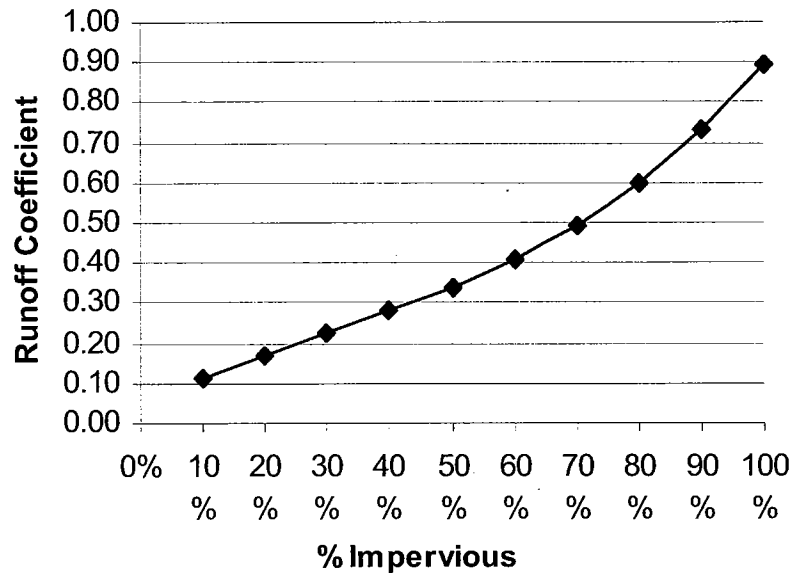
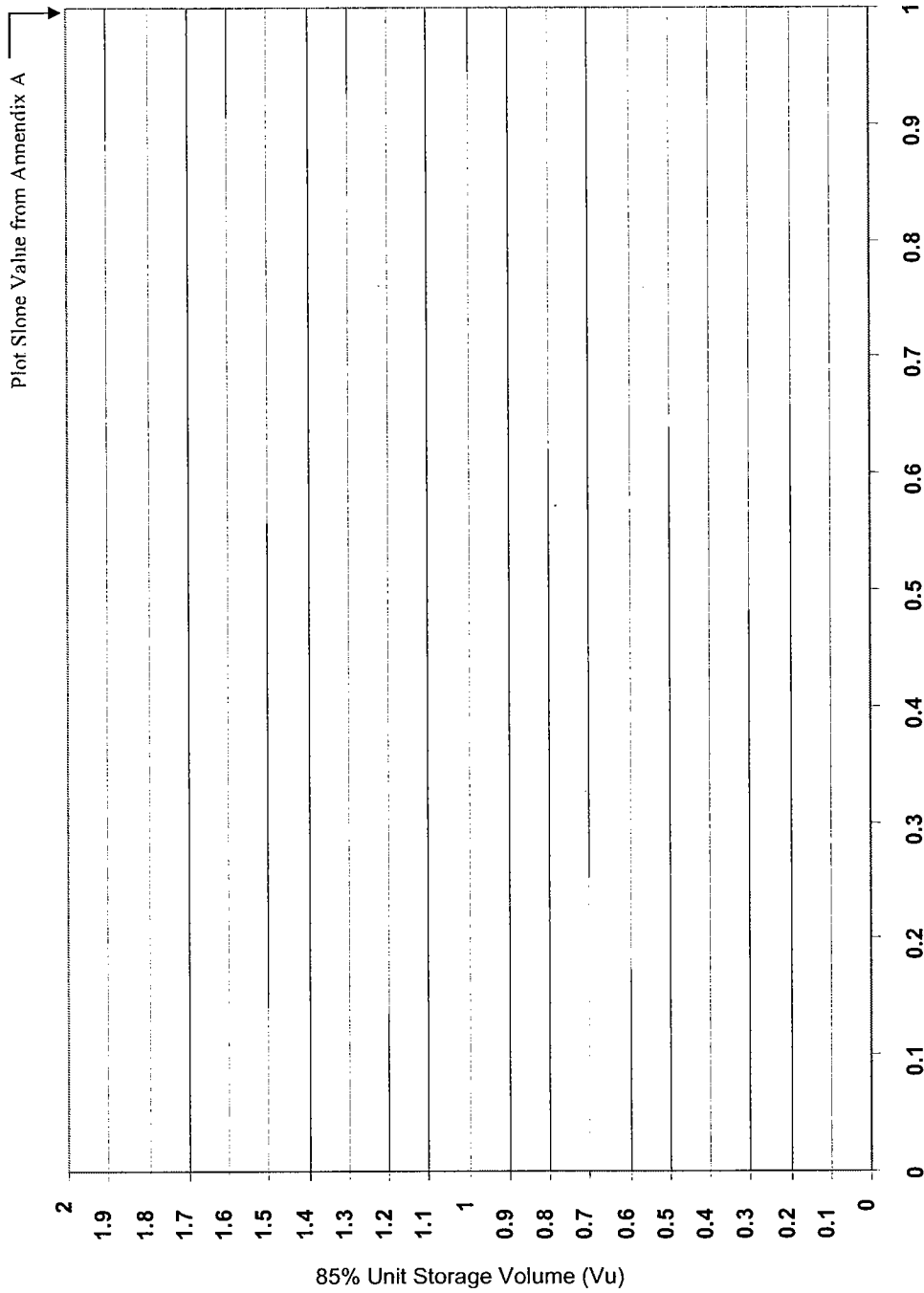


Figure 1. Impervious – Coefficient Curve (WEF/ASCE Method²⁴)

²⁴ Imperviousness is the decimal fraction of the total catchment covered by the sum of roads, parking lots, sidewalks, rooftops, and other impermeable surfaces of an urban landscape.



Worksheet 1

Design Procedure for BMP Design Volume85th percentile runoff event

Designer: _____

Company: _____

Date: _____

Project: _____

Location: _____

1. Create Unit Storage Volume Graph

- Site location (Township, Range, and Section).
- Slope value from the Design Volume Curve in **Appendix A**.
- Plot this value on the Unit Storage Volume Graph shown on **Figure 2**.
- Draw a straight line from this point to the origin, to create the graph

T & R
Section (1)

Slope = _____ (2)

Is this graph attached? Yes ☐ No ☐**2. Determine Runoff Coefficient**

- Determine total impervious area
- Determine total tributary area
- Determine Impervious fraction
 $i = (5) / (6)$
- Use (7) in **Figure 1** to find Runoff
OR $C = .858i^3 - .78i^2 + .774i + .04$

 $A_{\text{impervious}} =$ _____ acres (5) $A_{\text{total}} =$ _____ acres (6) $i =$ _____ (7) $C =$ _____ (8)**3. Determine 85% Unit Storage Volume**

- Use (8) in **Figure 2**
Draw a Vertical line from (8) to the graph, then a Horizontal line to the desired V_u value.

 $V_u =$ _____ $\frac{\text{in-acre}}{\text{acre}}$ (9)**4. Determine Design Storage Volume**

- $V_{\text{BMP}} = (9) \times (6)$ [in- acres]
- $V_{\text{BMP}} = (10) / 12$ [ft- acres]
- $V_{\text{BMP}} = (11) \times 43560$ [ft³]

 $V_{\text{BMP}} =$ _____ in-acre (10) $V_{\text{BMP}} =$ _____ ft-acre (11) $V_{\text{BMP}} =$ _____ ft³ (12)

Notes: _____

Flow Based BMPs

General

Flow based BMPs are sized to treat flows up to the design flow rate, which will remove pollutants to the MEP. This handbook bases the design flow rate on a uniform rainfall intensity of 0.2 inches per hour, as recommended by the California BMP Handbook. The flow rate is also dependent on the type of soil and percentage of impervious area in the development.

Uniform Intensity Approach

The Uniform Intensity Approach is where the Design Rainfall Intensity, I is specified as:

$$I = 0.2 \text{ in/hr}$$

That Intensity is then plugged into the Rational Equation to find the BMP design flow rate (Q).

$$Q_{\text{BMP}} = CIA$$

Where

- A = Tributary Area to the BMP
- C = Runoff Coefficient, based upon a Rainfall Intensity = 0.2 in/hr
- I = Design Rainfall intensity, 0.2 in/hr

A step-by-step procedure for calculating the design flow rate is presented on Worksheet 2. Table 4 shows runoff coefficient values pertaining to the type of soils and percent imperviousness.

Table 4. Runoff Coefficients for an Intensity = 0.2 ⁱⁿ/_{hr} for Urban Soil Types*

Impervious %	A Soil RI =32	B Soil RI =56	C Soil RI =69	D Soil RI =75
0 (Natural)	0.06	0.14	0.23	0.28
5	0.10	0.18	0.26	0.31
10	0.14	0.22	0.29	0.34
15	0.19	0.26	0.33	0.37
20 (1-Acre)	0.23	0.30	0.36	0.40
25	0.27	0.33	0.39	0.43
30	0.31	0.37	0.43	0.47
35	0.35	0.41	0.46	0.50
40 (1/2-Acre)	0.40	0.45	0.50	0.53
45	0.44	0.48	0.53	0.56
50 (1/4-Acre)	0.48	0.52	0.56	0.59
55	0.52	0.56	0.60	0.62
60	0.56	0.60	0.63	0.65
65 (Condominiums)	0.61	0.64	0.66	0.68
70	0.65	0.67	0.70	0.71
75 (Mobilehomes)	0.69	0.71	0.73	0.74
80 (Apartments)	0.73	0.75	0.77	0.78
85	0.77	0.79	0.80	0.81
90 (Commercial)	0.82	0.82	0.83	0.84
95	0.86	0.86	0.87	0.87
100	0.90	0.90	0.90	0.90

*Complete District's standards can be found in the Riverside County Flood Control Hydrology Manual

Worksheet 2

Design Procedure Form for Design Flow Uniform Intensity Design Flow	
Designer: _____ Company: _____ Date: _____ Project: _____ Location: _____	
1. Determine Impervious Percentage a. Determine total tributary area b. Determine Impervious %	$A_{total} = \underline{\hspace{2cm}}$ acres (1) $i = \underline{\hspace{2cm}}$ % (2)
2. Determine Runoff Coefficient Values Use Table 4 and impervious % found in step 1 a. A Soil Runoff Coefficient b. B Soil Runoff Coefficient c. C Soil Runoff Coefficient d. D Soil Runoff Coefficient	$C_a = \underline{\hspace{2cm}}$ (3) $C_b = \underline{\hspace{2cm}}$ (4) $C_c = \underline{\hspace{2cm}}$ (5) $C_d = \underline{\hspace{2cm}}$ (6)
3. Determine the Area decimal fraction of each soil type in tributary area a. Area of A Soil / (1) = b. Area of B Soil / (1) = c. Area of C Soil / (1) = d. Area of D Soil / (1) =	$A_a = \underline{\hspace{2cm}}$ (7) $A_b = \underline{\hspace{2cm}}$ (8) $A_c = \underline{\hspace{2cm}}$ (9) $A_d = \underline{\hspace{2cm}}$ (10)
4. Determine Runoff Coefficient a. $C = (3) \times (7) + (4) \times (8) + (5) \times (9) + (6) \times (10) =$	$C = \underline{\hspace{2cm}}$ (11)
5. Determine BMP Design flow a. $Q_{BMP} = C \times I \times A = (11) \times 0.2 \times (1)$	$Q_{BMP} = \underline{\hspace{2cm}}$ $\frac{ft^3}{s}$ (12)

Extended Detention Basins

General

An extended detention Basin is a permanent basin sized to detain and slowly release the design volume of stormwater, allowing particles and associated pollutants to settle out. An inlet forebay section and an inlet energy dissipater minimize erosion from entering flows, while erosion protection at the outlet prevents damage from exiting flows. The bottom of the basin slopes towards the outlet at an approximate grade of two percent, and a low flow channel conveys incidental flows directly to the outlet end of the basin. The basin should be vegetated earth in order to allow some infiltration to occur, although highly pervious soils may require an impermeable liner to prevent groundwater contamination. Proper turf management is also required to ensure that the vegetation does not contribute to water pollution through pesticides, herbicides, or fertilizers. A permanent micropool should not be included due to vector concerns. See Figure 3 for a typical basin design and Figure 5 for several outlet options. Extended detention basins can also be used to reduce the peaks of storm events for flood control purposes.

The basin outlet is designed to release the design runoff over a 48-hour drawdown period. The drawdown time refers to the minimum amount of time the design volume must be retained. In order to avoid vector breeding problems, the design volume should always empty within 72 hours. To function properly, the outlet must also be sized to retain the first half of the design volume for a minimum of 24 hours.

Extended Detention Basin Design Criteria:

Design Parameter	Unit	Design Criteria
Design Volume	ft ³	V _{BMP}
Drawdown time (total)	hrs	48 hrs ³
Drawdown time for 50% V _{BMP} (minimum)	hrs	24 hrs ³
Minimum tributary area	acre	5 acres ³
Inlet/outlet erosion control	-	Energy dissipater to reduce velocities ¹
Forebay volume	%	5 to 10 % of V _{BMP} ¹
Forebay drain time	min	Drain time < 45 minutes ¹
Low-flow channel depth	in	9 ¹
Low-flow chan. flow capacity	-	2 times the forebay outlet rate ¹
Bottom slope of upper stage	%	2.0 ¹
Length to width ratio (min.)	-	2:1 (larger preferred) ¹
Upper stage depth/width (min.)	ft	2' depth / 30' width ¹
Bottom stage volume	%	10 to 25 % of V _{BMP} ¹
Bottom stage depth	ft	1.5 to 3 ft deeper than top stage ¹
Freeboard (minimum)	ft	1.0 ¹
Embankment side slope	-	≥ 2:1 inside / ≥ 4:1 outside (w/o retaining)

(H:V)		walls) ¹
Maintenance access ramp slope	%	10 % or flatter ¹
Maintenance access ramp width	ft	15' – approach paved with asphalt concrete ¹

1. Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures
2. City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures
3. CA Stormwater BMP Handbook for New Development and Significant Redevelopment
4. Riverside County DAMP Supplement A Attachment

Extended Detention Basin Design Procedure

1. Design Volume

Use Worksheet 1- Design Procedure Form for Design Volume, V_{BMP} .

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1. Basin Shape

Whenever possible, shape the basin with a gradual expansion from the inlet toward the middle and a gradual contraction from middle toward the outlet. The length to width ratio should be a minimum of 2:1. Internal baffling with berms may be necessary to achieve this ratio.

2. Two-Stage Design

Whenever feasible, provide a two-stage design with a pool that fills often with frequently occurring runoff. This minimizes standing water and sediment deposition in the remainder of the basin.

a. Upper stage: The upper stage should be a minimum of 2 feet deep with the bottom sloped at 2 percent toward the low flow channel. Minimum width of the upper stage should be 30 feet.

b. Bottom stage: The active storage basin of the bottom stage should be 1.5 to 3 feet deeper than the top stage and store 10 to 25 percent of the design volume.

3. Forebay Design

The forebay provides a location for sedimentation of larger particles that has a solid bottom surface to facilitate mechanical removal of accumulated sediment. The forebay volume should be 5 to 10 percent of the V_{BMP} . A berm should separate the forebay from the upper stage of the basin. The outlet pipe from the forebay to the low-flow channel should be sized to drain the forebay volume in 45 minutes. The outlet pipe entrance should be offset from the forebay inlet to prevent short circuiting.

4. Low-flow Channel

The low flow channel conveys flow from the forebay to the bottom stage. Erosion protection should be provided where the low-flow channel enters the bottom stage. Lining of the low flow channel with concrete is recommended. The depth of the

channel should be at least 9 inches. The flow capacity of the channel should be twice the release capacity of the forebay outlet.

5. Trash Rack/Gravel Pack

A trash rack or gravel pack around perforated risers shall be provided to protect outlet orifices from clogging. Trash racks are better suited for use with perforated vertical plates for outlet control and allow easier access to outlet orifices for purposes of inspection and cleaning. Trash rack shall be sized to prevent clogging of the primary water quality outlet without restricting the hydraulic capacity of the outlet control orifices.

6. Basin Outlet

The basin outlet should be sized to release the design volume, V_{BMP} over a 48-hour period, with no more than 50 percent released in 24 hours. The outflow structure should have a trash rack or other acceptable means to prevent clogging, and a valve that can stop discharge from being released in case of an accidental spill in the watershed (Figure 5). The discharge through a control orifice can be calculated using the following steps:

- a. Develop a Stage vs. Discharge curve for the outlet structure
- b. For example: If using an orifice, select the orifice size and use the following equation to develop a Stage vs. Discharge relationship for this outlet:

$$Q = CA[2g(H-H_o)]^{0.5}$$

Where: Q = discharge (ft^3/s)

C = orifice coefficient

A = area of the orifice (ft)

G = gravitational constant ($32.2 \text{ ft}^2/\text{s}$)

H = water surface elevation (ft)

H_o = orifice elevation (ft)

Recommended values for C are 0.66 for thin material (e.g. CMP riser) and 0.8 when the material is thicker than the orifice diameter (e.g. concrete riser). Alternative non-mechanical hydraulic control structures are acceptable (e.g. weirs, risers, etc).

- c. Develop a Stage vs. Volume curve for the basin
Based on the shape and size of the basin, develop a relationship between the stage and the volume of water in the basin.
- d. Create an Inflow Hydrograph
Create an inflow hydrograph that delivers the design volume V_{BMP} instantaneously to the basin. This can be approximated by creating a hydrograph with two 5-minute intervals that together convey the entire V_{BMP} .
- e. Route the Volume through the Basin

Route the volume of water through the basin using these curves. If this meets the hydraulic retention time requirements (50% of the volume empties in not less than 24 hours, 100% of the volume empties in not less than 48 hours and not more than 72 hours) the outlet is correctly sized. If these requirements are not met, select a new outlet size or configuration and repeat the process.

7. Inlet/Outlet Design

Basin inlet and outlet points should be provided with an energy dissipation structure and/or erosion protection.

8. Turf Management

Basin vegetation provides erosion protection and improves sediment entrapment. Basin bottoms, berms, and side slopes may be planted with native grasses or with irrigated turf. Several BMPs must be implemented to ensure that this vegetation does not contribute to water pollution through pesticides, herbicides, or fertilizers. These BMPs shall include, at a minimum: (1) educational activities, permits, certifications, and other measures for local applicators and distributors; (2) integrated pest management measures that rely on non-chemical solutions; (3) the use of native vegetation; (4) schedules for irrigation and chemical application; and (5) the collection and proper disposal of unused pesticides, herbicides, and fertilizers.

9. Embankment

Embankment designs must conform to requirements of the State of California Division of Safety of Dams, if the basin dimensions cause it to fall under that agency's jurisdiction. Interior slopes should be no steeper than 2:1 and exterior slopes no steeper than 4:1. Flatter slopes are preferable. Embankment fill is discouraged and should never be higher than three feet unless the basin is to be publicly maintained.

10. Access

All-weather access to the bottom, forebay, and outlet works shall be provided for maintenance vehicles. Maximum grades of access ramps should be 10 percent and minimum width should be 15 feet.

11. Bypass

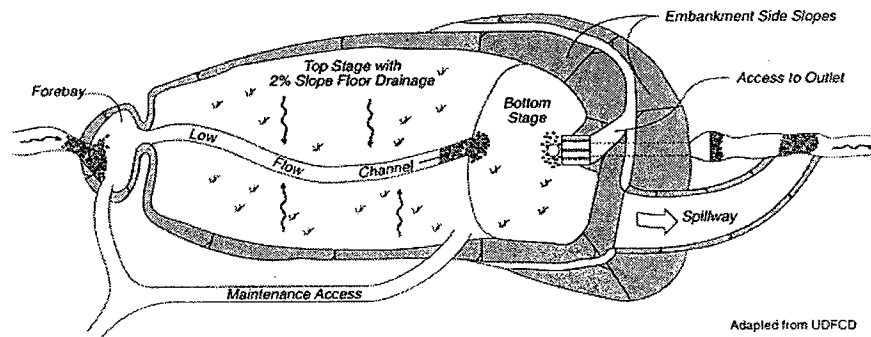
Provide for bypass or overflow of runoff volumes in excess of the design volume. Spillway and overflow structures should be designed in accordance with applicable standards of the Riverside County Flood Control District.

12. Geotextile Fabric

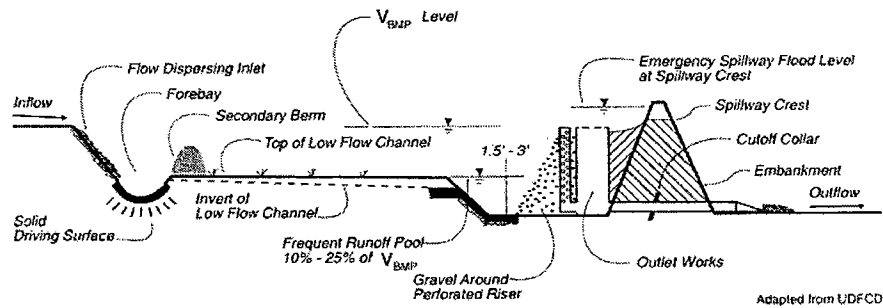
Non-woven geotextile fabric used in conjunction with gravel packs around perforated risers shall conform with the specifications located in Table 5.

Table 5. Non-woven Geotextile Fabric Specifications

Property	Test Reference	Minimum Specification
Grab Strength	7.1.1.1.1.1.2 ASTM D4632	90 lbs
Elongation at peak load	ASTM D4632	50 %
7.1.1.1.1.1.3 Puncture Strength	ASTM D3787	45 lbs
Permitivity	ASTM D4491	0.7 sec ⁻¹
Burst Strength	ASTM D3786	180 psi
Toughness	% Elongation x Grab Strength	5,500 lbs
Ultraviolet Resistance (% strength retained at 500 Weatherometer hours)	ASTM D4355	70 %



Plan View



Section View

Figure 3: EXTENDED DETENTION BASIN

Source: Ventura County Guidance Manual

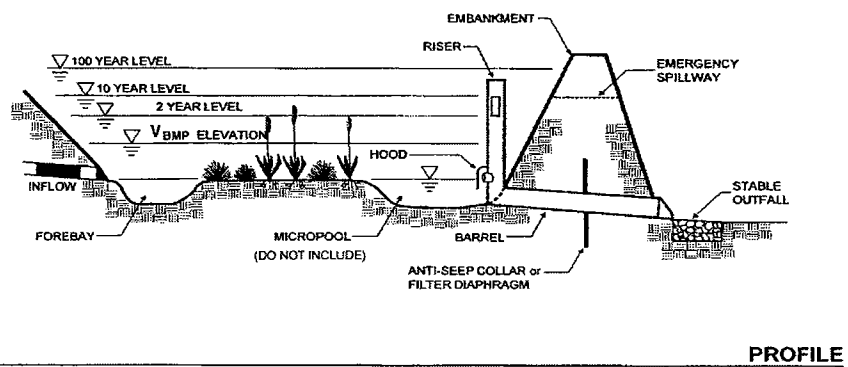
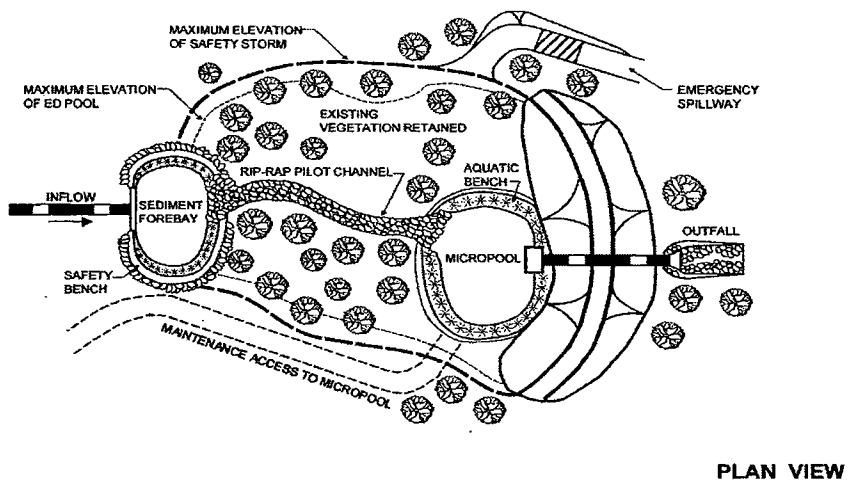
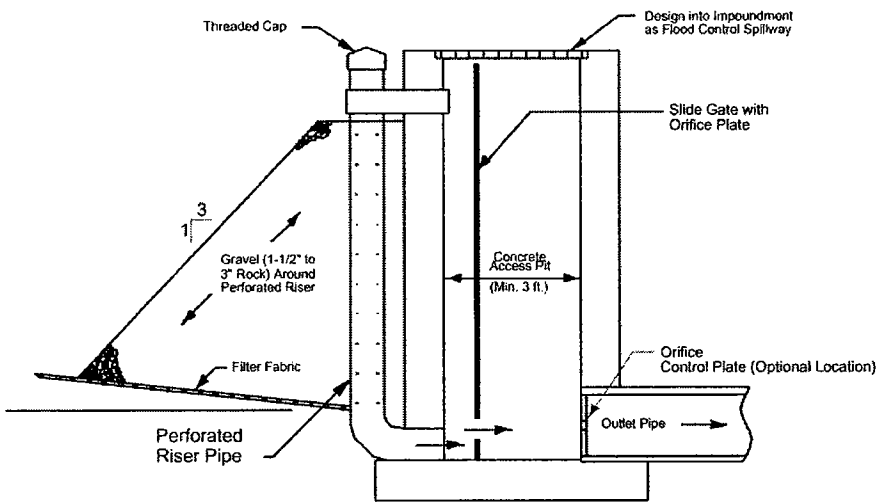
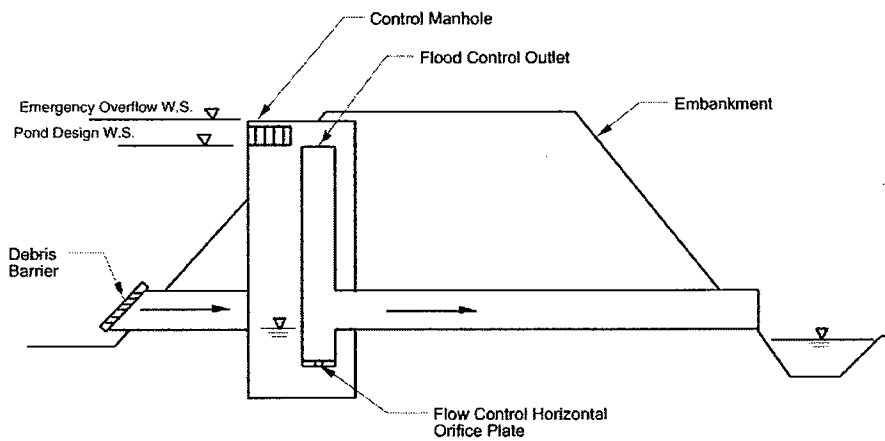


Figure 4: EXTENDED DETENTION / INCREASED RUNOFF BASIN

Source: CA BMP Handbook (2003)



PERFORATED RISER PIPE WITH VERTICAL FLOW CONTROL ORIFICE
NOT TO SCALE



CONTROL MANHOLE WITH SUBMERGED HORIZONTAL ORIFICE PLATE
NOT TO SCALE

Figure 5: EXTENDED DETENTION BASIN TYPICAL OUTLETS

Source: Ventura County Guidance Manual

July 24, 2006

Worksheet 3

Design Procedure Form for Extended Detention Basin	
Designer: _____ Company: _____ Date: _____ Project: _____ Location: _____	
1. Determine Design Volume (Use Worksheet 1) a. Total Tributary Area (minimum 5 ac.) b. Design Volume, V_{BMP}	$A_{total} =$ _____ acres $V_{BMP} =$ _____ ft^3
2. Basin Length to Width Ratio (2:1 min.)	Ratio = _____ L:W
3. Two-Stage Design a. Overall Design 1) Depth (3.5' min.) 2) Width (30' min.) 3) Length (60' min.) 4) Volume (must be $\geq V_{BMP}$) b. Upper Stage 1) Depth (2' min.) 2) Bottom Slope (2% to low flow channel recommended) c. Bottom Stage 1) Depth (1.5' to 3') 2) Length 3) Volume (10 to 25% of V_{BMP})	Depth = _____ ft Width = _____ ft Length = _____ ft Volume = _____ ft^3 Depth = _____ ft Slope = _____ % Depth = _____ ft Length = _____ ft Volume = _____ ft^3
4. Forebay Design a. Forebay Volume (5 to 10% of V_{BMP}) b. Outlet pipe drainage time (≈ 45 min)	Volume = _____ ft^3 Drain time = _____ minutes
5. Low-flow Channel a. Depth (9" minimum) b. Flow Capacity ($2 * \text{Forebay } Q_{OUT}$)	Depth = _____ ft $Q_{Low Flow} =$ _____ cfs
6. Trash Rack or Gravel Pack (check one)	Trash Rack _____ Gravel Pack _____

<p>7. Basin Outlet</p> <p>a. Outlet type (check one)</p> <p>b. Orifice Area</p> <p>c. Orifice Type</p> <p>d. Maximum Depth of water above bottom orifice</p> <p>e. Length of time for 50% V_{BMP} drainage (24 hour minimum)</p> <p>f. Length of time for 100% V_{BMP} drainage (between 48 and 72 hours)</p> <p>g. Attached Documents (all required)</p> <p>1) Stage vs. Discharge</p> <p>2) Stage vs. Volume</p> <p>3) Inflow Hydrograph</p> <p>4) Basin Routing</p>	<p>Single orifice _____</p> <p>Multi-orifice plate _____</p> <p>Perforated Pipe _____</p> <p>Other _____</p> <p>Area = _____ ft²</p> <p>Type _____</p> <p>Depth = _____ ft</p> <p>Time 50% = _____ hrs</p> <p>Time 100% = _____ hrs</p> <p>Attached Documents (check)</p> <p>1) _____</p> <p>2) _____</p> <p>3) _____</p> <p>4) _____</p>
<p>8. Increased Runoff (optional)</p> <p>Is this basin also mitigating increased runoff?</p> <p>Attached Documents (all required) for 2, 5, & 10-year storms:</p> <p>1) Stage vs. Discharge</p> <p>2) Stage vs. Volume</p> <p>3) Inflow Hydrograph</p> <p>4) Basin Routing</p>	<p>Yes _____ No _____</p> <p>(if No, skip to #9)</p> <p>Attached Documents (check)</p> <p>1) _____</p> <p>2) _____</p> <p>3) _____</p> <p>4) _____</p>
<p>9. Vegetation (check type)</p>	<p>_____ Native Grasses</p> <p>_____ Irrigated Turf</p> <p>_____ Other</p> <p>_____</p>
<p>10. Embankment</p> <p>a. Interior slope (4:1 max.)</p> <p>b. Exterior slope (3:1 max.)</p>	<p>Interior Slope = _____ %</p> <p>Exterior Slope = _____ %</p>
<p>11. Access</p> <p>a. Slope (10% max.)</p> <p>b. Width (16 feet min.)</p>	<p>Slope = _____ %</p> <p>Width = _____ ft</p>

Notes:

Infiltration Basins

General

An infiltration basin is an earthen basin designed to capture the design volume of runoff and infiltrate that stormwater back into the pervious natural surrounding soil. These basins have only an emergency spillway, not a standard outlet, although a relief underdrain will drain the basin if standing water conditions occur. Flows that exceed the design volume should be diverted around the infiltration basin. The basin is designed to retain the design volume and allow it to percolate into the underlying soil over a period of 48 hours, which removes soluble and fine particulate pollutants. Sediment clogging can be avoided by including a settling basin near the inlet as well as the required energy dissipater. The sides and bottom of the basin include vegetation to protect the basin from erosion. Infiltration basins typically treat developments up to 50 acres in size.

Infiltration basins have select applications. Their use is often sharply restricted by concerns over ground water contamination, soils, and clogging at the site. These basins are not appropriate for the following site conditions: industrial sites or locations where spills occur, sites with C or D type soils, and sites with high infiltration rates where pollutants can affect ground water quality. The upstream tributary area must be completely stabilized before construction. In addition, some studies have shown relatively high failure rates compared with other management practices. Finally, infiltration basins are difficult to restore infiltration once the basin has been clogged.

Infiltration Basin Design Criteria:

Design Parameter	Unit	Design Criteria
Design Volume	ft ³	V _{BMP}
Drawdown time	hrs	48 hrs ³
Maximum Tributary Area	acre	50 acres ⁴
Minimum Infiltration Rate	in/hr	0.5 in/hr ⁴
Bottom Basin elevation	ft	5 feet or more above seasonally high groundwater table ¹
Minimum Freeboard	ft	1.0 ft ¹
Setbacks	ft	100 feet from wells, tanks, fields, springs ¹ 20 feet down slope of 100 feet up slope from foundations ¹
Inlet/outlet erosion control	-	Energy dissipater to reduce inlet/outlet velocity ¹
Embankment side slope (H:V)	-	4:1 or flatter inside slope/ 3:1 or flatter outside slope (without retaining walls) ¹
Maintenance access ramp slope (H:V)	-	10:1 or flatter ¹
Maintenance access ramp width	ft	16.0 – approach paved with asphalt concrete ¹
Vegetation	-	Side slopes and bottom (may require

Relief Underdrain	-	irrigation during summer) ¹ A perforated PVC pipe with valve is to be installed to serve as a relief drain in the event of system failure. ²
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- 1 Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures
 2 City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures
 3 CA Stormwater BMP Handbook for New Development and Significant Redevelopment
 4 Riverside County DAMP Supplement A Attachment

Infiltration Basin Design Procedure

1. Design Storage Volume
Use Worksheet 1- Design Procedure Form for Design Storage Volume, V_{BMP} .
2. Basin Surface Area
Calculate the minimum surface area:

$$A_m = V_{BMP} / D_m$$

Where A_m = minimum area required (ft²)
 V_{BMP} = volume of the infiltration basin (ft³)
 D_m = maximum allowable depth (ft)

$$D_m = [(t) \times (I)] / 12s$$

Where I = site infiltration rate (in/hr)
 s = safety factor
 t = minimum drawdown time (48 hours)

In the formula for maximum allowable depth, the safety factor accounts for the possibility of inaccuracy in the infiltration rate measurement. The less certain the infiltration rate the higher the safety factor shall be. Minimum safety factors shall be as follows:

- Without site-specific borings and percolation tests, use $s = 10$
- With borings (but no percolation test), use $s = 6$
- With percolation test (but no borings), use $s = 5$
- With borings and percolation test, use $s = 3$

It is recommended that the infiltration rate be determined through site-specific soils tests. The Infiltration rate can also be estimated by using the District's Hydrology Manual. To estimate the infiltration rate with the District's Hydrology Manual determine a RI number using plate D-5.5, then use plate E-6.2 to find the loss rate (keep in mind this loss rate is for pervious areas only).

3. Inline/Offline

July 24, 2006

Basins may be on-line or off-line with flood control facilities. For on-line basins, the water quality outlet may be superimposed on the flood control outlet or may be constructed as a separate outlet.

4. Basin Inlet

The inlet structure should dissipate energy of incoming flow to avoid scouring of the basin. If high sediment loads are anticipated a settling basin with a volume of 10 to 20 percent of the design volume should be placed at the inlet of the basin.

5. Vegetation

Bottom vegetation provides erosion protection and sediment entrapment. Basin bottoms, berms, and side slopes may be planted with native grasses or with irrigated turf.

6. Embankments

Design embankments to conform to requirements of State of California Division of Safety of Dams, if the basin dimensions cause it to fall under that agency's jurisdiction. Interior slopes should be no steeper than 4:1 and exterior slopes no steeper than 3:1. Flatter slopes are preferable.

7. Access

All-weather access to the bottom, forebay, and outlet works shall be provided for maintenance vehicles. Maximum grades of access ramps should be 10 percent and minimum width should be 16 feet. Ramps should be paved with concrete. Provide security fencing, except when used as a recreation area.

8. Bypass

Provide for bypass or overflow of runoff volumes in excess of the design volume. Spillway and overflow structures should be designed in accordance with applicable standards of the Riverside County Flood Control District.

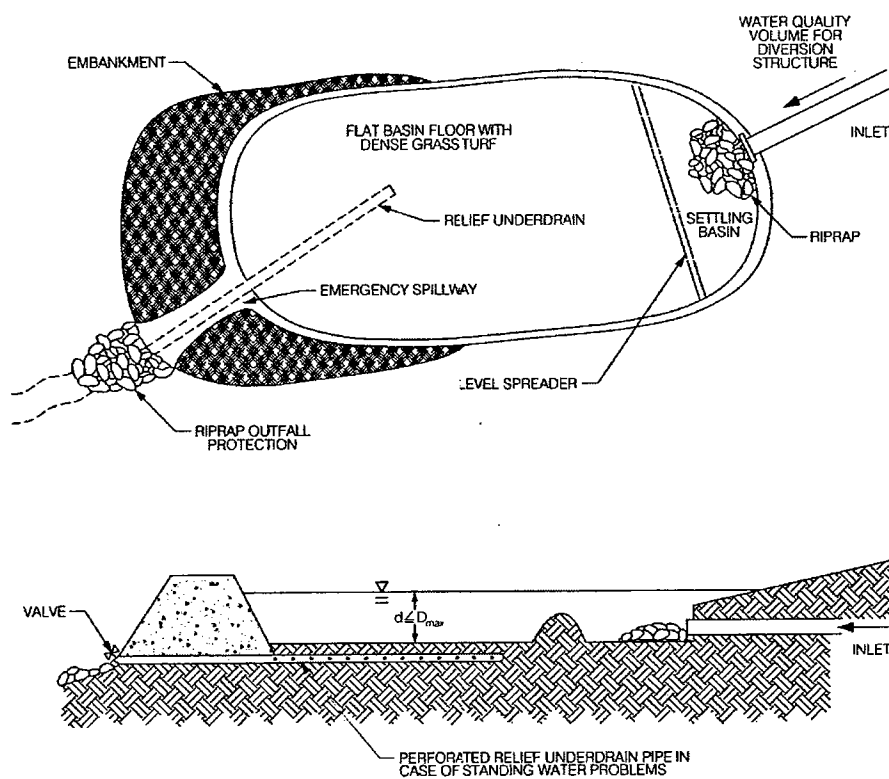


Figure 6: INFILTRATION BASIN

Source: City of Modesto Guidance Manual

Worksheet 4

Design Procedure Form for Infiltration Basin

Designer: _____
 Company: _____
 Date: _____
 Project: _____
 Location: _____

1. Determine Design Storage Volume
(Use Worksheet 1)
- Total Tributary Area (maximum 50)
 - Design Storage Volume, V_{BMP}

$A_{total} =$ _____ acres
 $V_{BMP} =$ _____ ft^3

2. Maximum Allowable Depth (D_m)
- Site infiltration rate (I)
 - Minimum drawdown time (48 hrs)
 - Safety factor (s)
 - $D_m = [(t) \times (I)]/[12s]$

$I =$ _____ in/hr
 $t =$ _____ hrs
 $s =$ _____
 $D_m =$ _____ ft

3. Basin Surface Area
 $A_m = V_{BMP} / D_m$

$A_m =$ _____ ft^2

4. Vegetation (check type used or describe "other")

☐ Native Grasses
☐ Irrigated Turf Grass
☐ Other

Notes:

Infiltration Trenches

General

An infiltration trench is an excavated trench that has been refilled with a gravel and sand bed capable of holding the design volume of stormwater runoff. The runoff is stored in the trench over a period of time (48 hours) during which it slowly infiltrates back into the naturally pervious surrounding soil. This infiltration process effectively removes soluble and particulate pollutants, however it is not intended to trap coarse sediments. It is recommended that an upstream control measure such as a grass swale or filter strip be combined with an infiltration trench to remove sediments that might clog the trench. These trenches also include a bypass system for volumes greater than the design capture volume, and a perforated pipe as an observation well to monitor water depth. An infiltration trench can typically treat developments up to 10 acres.

Infiltration Trench Design Criteria

Design Parameter	Unit	Design Criteria
Design Volume	ft ³	V _{BMP}
Drawdown time	hrs	48 hrs ³
Maximum Tributary Area	acre	10 acres ^{2&3}
Minimum Infiltration Rate of Soil	in/hr	0.27 in/hr ⁴
Trench bottom elevation	ft	5 feet or more above seasonally high groundwater table ¹
Maximum Trench depth (Dm)	ft	8.0 ft ¹
Gravel bed material	ft	Clean, washed aggregate 1 to 3 inches in diameter ¹
Trench lining material	-	Geotextile fabric ¹ or 6" layer of sand ⁴
Setbacks	ft	100 feet from wells, tanks, fields, or springs ¹ 20 feet down slope or 100 feet up slope from foundations ¹ Do not locate under tree drip-lines ¹

¹ Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures

² City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures

³ CA Stormwater BMP Handbook for New Development and Significant Redevelopment

⁴ Riverside County DAMP Supplement A Attachment

Infiltration Trench Design Procedure**1. Design Storage Volume**

Use Worksheet 1- Design Procedure Form for Design Storage Volume, V_{BMP} .

2. Trench Water Depth

Calculate the maximum allowable depth of water in the trench, D_m , in feet. Maximum depth should not exceed 8 feet:

$$D_m = [(t) \times (I)] / (12s)$$

Where I = site infiltration rate (in/hr)

s = safety factor

t = minimum drawdown time (48 hours)

In the formula for maximum allowable depth, the safety factor accounts for the possibility of inaccuracy in the infiltration rate measurement. The less certain the infiltration rate, the higher the safety factor should be. Minimum safety factors shall be as follows:

- Without site-specific borings and percolation tests, use $s = 10$
- With borings (but no percolation test), use $s = 6$
- With percolation test (but no borings), use $s = 5$
- With borings and percolation test, use $s = 3$

3. Trench Surface Area

Calculate the minimum surface area of the trench bottom:

$$A_m = V_{BMP} / D_m$$

Where A_m = minimum area required (ft^2)

V_{BMP} = Detention Volume (ft^3)

D_m = maximum allowable depth (ft)

4. Observation Well

Provide a vertical section of perforated PVC pipe, 4 to 6 inches in diameter, installed flush with top of trench on a foot-plate and with a locking, removable cap.

5. Bypass

Provide for bypass or overflow of runoff volumes in excess of the SQDV by means of a screened overflow pipe connected to downstream storm drainage or grated overflow outlet.

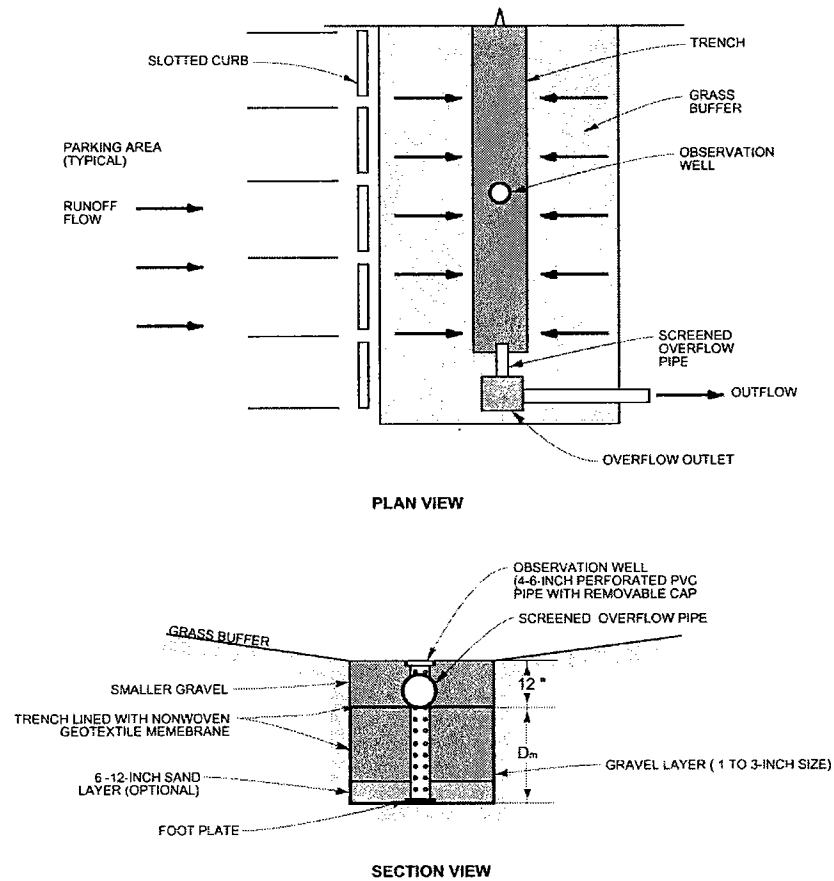


Figure 7: INFILTRATION TRENCH

Source: Ventura County Guidance Manual

Worksheet 5

Design Procedure Form for Infiltration Trench

Designer: _____
 Company: _____
 Date: _____
 Project: _____
 Location: _____

1. Determine Design Storage Volume
(Use worksheet 1)
- Total Tributary Area (maximum 10)
 - Design Storage Volume, V_{BMP}

$A_{total} =$ _____ acres
 $V_{BMP} =$ _____ ft^3

2. Maximum Allowable Depth ($D_m = t/12s$)
- Site infiltration rate (I)
 - Minimum drawdown time ($t = 48$ hrs)
 - Safety factor (s)
 - $D_m = t/12s$

$I =$ _____ in/hr
 $t =$ _____ hrs
 $s =$ _____
 $D_m =$ _____ ft

3. Trench Bottom Surface Area
 $A_m = V_{BMP} / D_m$

$A_m =$ _____ ft^2

Notes:

Porous Pavement

General

Porous Pavement is an infiltration BMP that consists of porous pavement blocks placed over a shallow recharge bed of sand and gravel. It is typically restricted to low volume parking areas that do not receive significant offsite runoff. The modular pavement blocks allow water to seep into the recharge bed, where the sand and gravel layers percolate the design volume into the natural surrounding soils. Porous Pavement can be used for areas of up to 10 acres.

Porous Pavement Design Criteria:

Design Parameter	Unit	Design Criteria
Design Volume	ft ³	V _{BMP}
Drawdown Time	hrs	12 hours ¹
Maximum Tributary Area	acre	10 acres ^{2,4}
Maximum contributing area slope	%	5 % ^{2,4}
Traffic Use	-	Locate in areas of low intensity traffic use ^{2,4}
Erosion	-	Avoid areas of high wind erosion ²
Placement	-	Do not locate in narrow strips between areas of impervious pavement ²
Land use	-	Do not use in high-risk land uses, i.e. service/gas stations, truck stops, heavy industrial sites ²
Sediment	-	Sediment-laden runoff must be directed away from the porous pavement/recharge bed. Place filter fabric on the floor and sides of the recharge bed. ²
Modular Porous Block Type	%	40% surface area open ¹
Porous Pavement Infill	-	ASTM C-33 Sand or equivalent ¹
Base Course	inches	1" sand (ASTM C-33) over 9" gravel ¹
Perimeter Wall Width	inches	6 inches ¹

¹ Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures

² City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures

³ CA Stormwater BMP Handbook for New Development and Significant Redevelopment

⁴ Riverside County DAMP Supplement A Attachment

Porous Pavement Design Procedure**1. Design Storage Volume**

Use Worksheet 1- Design Procedure Form for Design Storage Volume, V_{BMP} .

2. Basin Surface Area

Calculate minimum required surface area, A_m , based on surcharge depth of 2

inches as follows:

$$A_m = V_{BMP} / 0.17 \text{ ft}$$

3. Select Block Type

Select appropriate modular blocks that have no less than 40 percent of the surface area open. The manufacturer's installation requirements shall be followed with the exception of the infill material and base dimensions, which will meet the criteria listed in this manual.

4. Porous Pavement Infill

The pavement block openings should be filled with ASTM C-33 graded sand (fine concrete aggregate, not sandy loam turf).

5. Base Courses

Provide a 1-inch thick sand base course over a 9-inch thick gravel base course.

6. Perimeter Wall

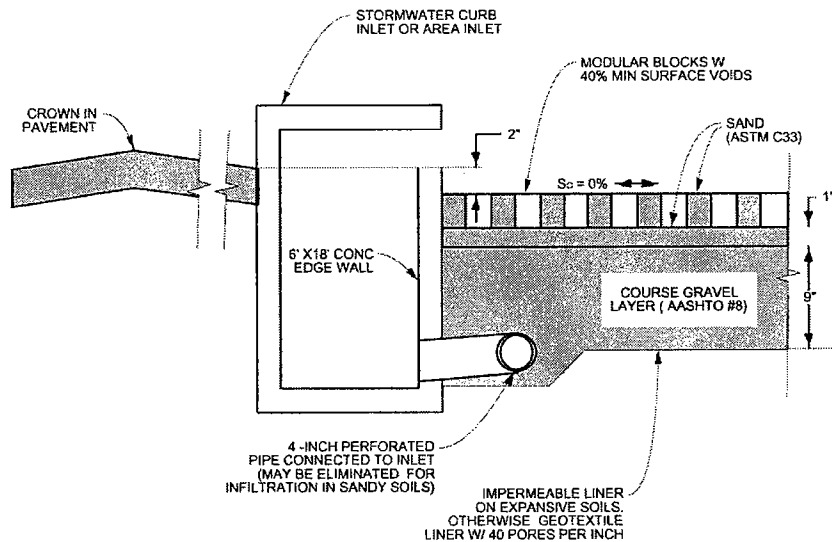
Provide a concrete perimeter wall to confine the edges of the pavement area. The wall should be minimum 6-inch wide and at least 6 inches deeper than all the porous media and modular block depth combined.

7. Sub-base

If expansive soils or rock are a concern or the tributary catchment has chemical or petroleum products handled or stored, install an impermeable membrane below the base course. Otherwise install a non-woven geotextile membrane to encourage filtration.

8. Overflow

Provide an overflow, possibly with an inlet to a storm sewer, set at 2 inches above the level of the porous pavement surface. Make sure the 2-inch ponding depth is contained and does not flow out of the area at ends or sides.



ADAPTED FROM UDFCD, 1999

Figure 8: Porous Pavement Detention

Source: Ventura County Guidance Manual

Worksheet 6

Design Procedure Form for Porous Pavement

Designer: _____
 Company: _____
 Date: _____
 Project: _____
 Location: _____

1. Determine Design Storage Volume
(Use Worksheet 1)
- Total Tributary Area (maximum 10)
 - Design Storage Volume, V_{BMP}

$A_{total} =$ _____ acres
 $V_{BMP} =$ _____ ft^3

1. Basin Surface Area
- Detention Volume V_{BMP}
 - $A_m = V_{BMP} / (0.17 \text{ ft})$

$V_{BMP} =$ _____ ft^3
 $A_m =$ _____ ft^2

2. Block Type
- Minimum open area = 40%
 - Minimum thickness = 4 inches

Block Name = _____
 Manufacturer = _____
 Open Area = _____ %
 Thickness = _____ inches

3. Base Course
- ASTM C33 Sand Layer (1 inch)
 - ASSHTO M43-No.8 Gravel Layer (9 inches)

Sand Layer _____ (check)
 Gravel Layer _____ (check)

Notes:

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Sand Filters

General

Sand Filters capture and treat the design runoff in a two-part system, first a settling basin, then a filter bed. The settling basin collects large sediment and prevents these particles from clogging the filter bed. The sand bed then strains the water, removing soluble and particulate pollutants. The treated water is conveyed through pipes back into a stream or channel. Sand Filters are especially useful where water quality concerns might preclude the use of infiltration BMPs.

There are many variations of sand filter designs, and it is up to the designer to determine the most effective sand filter to use in each case. Two of the most common sand filters, the Austin sand filter and the Delaware sand filter, have been conditioned in this manual. Although the Austin filter was not included in the Attachment, it was added to this manual because it can treat a very large tributary area and because it is well suited to southern California. Other sand filter designs may be used if it is shown that they are more appropriate.

Some of the limitations associated with Sand Filters include: higher requirement for hydraulic head (typically > 4'), they work best for small tributary areas, vector problems with permanent standing water for certain Sand Filters, and the addition of concrete walls may cause aesthetic and safety problems.

Austin Sand Filter

The Austin Sand Filter, as developed by the city of Austin, Texas, is an aboveground sand filter that does not include a permanent wet pool. The filter inlet captures the design volume, while directing larger flows past. The first chamber of the filter is the sedimentation basin, which holds the entire design volume (this handbook conditions a full sedimentation design). The design volume drains into the second chamber, which is the filtration basin, over a period of 48 hours. This allows large particles to settle in the sedimentation basin and protects the filter bed from clogging. The sand and gravel filter bed removes soluble and particulate pollutants, and the treated water is returned to a storm drain. In order to drain by gravity, an Austin sand filter must be located in an area where the topography has sufficient vertical drops. These filters can be used to treat runoff from areas up to 100 acres large.

Austin Sand Filter Basin Design Criteria:

Design Parameter	Unit	Design Criteria
Design Volume	ft ³	V _{BMP}
Maximum tributary area	acre	100 ¹
Minimum sedimentation basin depth	ft	3 ¹
Minimum sedimentation basin area (A _s)	ft ²	V _{BMP} / 10 ft ¹
Length to Width ratio (L:W)	-	2 to 1 or greater ¹
Draw-down time	hrs	48 ³
Freeboard	ft	1.0 ft above maximum water surface elevation ¹
Minimum sedimentation basin volume	ft ³	V _{BMP} + freeboard volume ¹
Maximum inlet velocity	fps	3.0 ¹
Minimum particle size removed	micron	20 (specific gravity =2.65) ¹
Minimum gravel depth over sand filter	inches	2 ¹
Maximum water depth over filter, 2h	ft	Between 2 and 10 feet ³
Minimum sand depth, d _s	inches	18 ¹
Minimum filtration rate of filter, k	ft/d	3.5 ¹
Slope of sand filter surface	%	0 ¹
Minimum gravel cover over underdrain	inches	2 ¹
Sand size, diameter	inches	0.02 – 0.04 ¹
Underdrain gravel diameter size	inches	0.5 – 2.0 ¹
Minimum inside diameter underdrain	inches	6 ¹
Underdrain pipe type	-	PVC schedule 40 (or thicker) ¹
Minimum slope of underdrain	%	1.0 ¹
Minimum underdrain perforation diameter	inches	0.375 ¹
Minimum perforations per row	-	6 ¹
Minimum space between perforation rows	inches	6 ¹
Minimum gravel bed depth, d _g	inches	16 ¹

¹ Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures

² City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures

³ CA Stormwater BMP Handbook for New Development and Significant Redevelopment

⁴ Riverside County DAMP Supplement A Attachment

Austin Sand Filter Design Procedure

Part I – Sedimentation Basin Design

1. Design Storage Volume

Use Worksheet 1- Design Procedure Form for Design Storage Volume, V_{BMP} .

2. Maximum Water Depth

Determine maximum allowable depth of water (2h) in the sedimentation basin considering elevation differences between inlet and outlet inverts of the sedimentation basin and filter surface. (This sets the height or elevation of the inlet invert for bypass pipes and orifices).

3. Sedimentation Basin Design

The sedimentation basin design should maximize the distance from the inlet to the outlet while avoiding short circuiting (flow reaching the outlet structure before it passes through the sedimentation basin volume) and dead storage areas (areas in the basin that are bypassed by the main flow). The basin shape should include a gradual expansion from the inlet and a gradual contraction toward the outlet. The length to width ratio should be a minimum of 2:1. Internal baffling with berms may be necessary to achieve this ratio.

a. Find the sedimentation basin area, A_s

$$A_s = V_{BMP} / (2h)$$

b. Determine the basin length and width

$$A_s = 2 \times W^2$$

$$\text{length} = 2 \times \text{width}$$

4. Energy Dissipation Structure

Basin inlet and outlet points should include an energy dissipation structure and/or erosion protection. An energy dissipation structure is required when inlet velocities exceed 3 feet per second.

5. Sedimentation Inlet

The inlet structure design must isolate the water quality volume and convey flows greater than the V_{BMP} past the basin. The water quality volume should be discharged uniformly and at low velocities into the sedimentation basin.

6. Sedimentation Outlet

The outlet structure conveys the water quality volume from the sedimentation basin to the filtration basin. The outlet structure shall be designed to outlet the design volume (ponded to a height of 2h) into the filter basin over a drawdown period of 48 hours.

7. Trash Rack/Gravel Pack

A trash rack or gravel pack around perforated risers shall be provided to protect outlet orifices from clogging.

8. Sediment Trap (optional)

Placing a sediment trap in the basin can improve long-term removal efficiency and reduce maintenance requirements.

Part II – Filter Basin Design

9. Filter Basin Surface Area

The required filter basin surface area (A_f) can be calculated using the following simplified equation from the CA BMP Handbook:

$$A_f = V_{BMP} / 18$$

10. Filter Basin Volume

The storage capacity of the filtration basin, above the surface of the filter media, should be greater than or equal to 20 percent of the V_{BMP} . This capacity is necessary in order to account for backwater effects resulting from partially clogged filter media. If the filter basin volume is less than the required volume, redesign with an increased filter depth or increase the filter area.

11. Filter Basin Inlet Structure

The inlet structure should spread the flow uniformly across the surface of the media filter. Flow spreaders, weirs or multiple orifice openings are recommended.

12. Filter Bed

The sand bed may be a choice of one of the two configurations given below. Note: Sand bed depths are final, consolidated depths. Consolidated effects must be taken into account.

1) Sand Bed with Gravel Layer (Figure 9A)

The sand layer is a minimum depth of 18 inches consisting of 0.02-0.04 inch diameter sand. Under the sand is a layer of 0.5 to 2.0 inch diameter gravel which provides a minimum of two inches of cover over the top of the underdrain lateral pipes. No gravel is required under the lateral pipes. A layer of geotextile fabric meeting the following specifications must separate the sand and gravel and must be wrapped around the lateral pipes:

Table 6. Geotextile Fabric Specifications

Property	Test Method	Unit	Specification
Material			Nonwoven geotextile fabric
Unit Weight		Oz/yd ²	8 (minimum)
Filtration Rate		In/sec	0.08 (minimum)
Puncture Strength	ASTM D-751 (modified)	Lb.	125 (minimum)

Mullen Burst Strength	ASTM D-751	PSI	400 (minimum)
Tensile Strength	ASTM-D-1682	Lb.	300 (minimum)
Equiv. Opening Size	US Standard Sieve	No.	80 (minimum)

Drainage matting meeting the following specifications should be placed under the laterals to provide for adequate vertical and horizontal hydraulic conductivity to the laterals:

Table 7. Drainage Matting Specifications

Property	Test Method	Unit	Specification
Material			Nonwoven geotextile fabric
Unit Weight		Oz/yd ²	20
Flow Rate (fabric)		GPM/ft ²	180 (minimum)
Permeability	ASTM D-2434	Cm/sec	12.4 x 10 ⁻²
Grab strength (fabric)	ASTM D-1682	Lb.	Dry Lg. 90 Dry Wd. 70 Wet Lg. 95 Wet Wd. 70
Puncture Strength (fabric)	COE CW-02215	Lb.	42 (minimum)
Mullen burst strength	ASTM D-1117	Psi	140 (minimum)
Equiv. opening size	US Standard Sieve	No.	100 (70 – 120)
Flow rate (drainage core)	Drexel Univ. Test Method	GPM/ft. width	14

In areas with high sediment load (total suspended solids concentration ≥ 200 mg/L), the two-inch layer of stone on top of the sand filter should be underlain with Enkadrain 9120 filter fabric or equivalent with the following specifications:

Table 8. Filter Fabric Specifications

Property	Test Method	Unit	Specification
Material			Nonwoven geotextile fabric
Unit Weight	ASTM D-1777	Oz/yd ²	4.3 (minimum)
Flow Rate	Failing Head Test	GPM/ft ²	120 (minimum)
Puncture Strength	ASTM-D751 (modified)	Lb.	60 (minimum)
Thickness		inches	0.8 (minimum)

2) Sand Bed with Trench Design (Figure 9B)

The top layer shall be 12-18 inches of 0.02-0.04 inch diameter sand. Laterals shall be placed in trenches with a covering of 0.5 to 2.0-inch gravel and geotextile fabric. The laterals shall be underlain by a layer of drainage matting. The geotextile fabric is needed to prevent the filter media from infiltrating into the lateral piping. The drainage matting is needed to provide for adequate vertical and horizontal hydraulic conductivity to the laterals. The geotextile fabric and drainage matting specifications are listed above in Tables 6 and 7 respectively. A minimum 2" layer of stone will be placed on top of the sand bed underlain with filter fabric (Table 8) in tributary areas with high sediment loads (TSS \geq 200 mg/L).

13. Underdrain Piping

The underdrain piping consists of the main collector pipe(s) and perforated lateral branch pipes. The piping should be reinforced to withstand the weight of the overburden. Internal diameters of lateral branch pipes should be six inches or greater and perforations should be 3/8 inch. Each row of perforations should contain at least six holes and the maximum spacing between rows of perforations should not exceed six inches. All piping is to be schedule 40 polyvinyl chloride or greater strength. The minimum grade of piping shall be 1 percent slope (slopes down to 0.5% are acceptable with prior approval). Access for cleaning all underdrain piping is needed.

Note: No draw-down time is to be associated with sand filtration basins, only with sedimentation basins. Thus, it is not necessary to have a specifically designed orifice for the filtration outlet structure.

14. Filter Basin Liner

If an impermeable liner is required to protect ground water quality it shall meet the specifications for clay liner given in Table 9. The clay liner should have a minimum thickness of 12 inches. If an impermeable liner is not required then a geotextile fabric liner shall be installed that meets the specifications listed in Table 6 unless the pond has been excavated to bedrock. If a geomembrane is used it should have a minimum thickness of 30 mils and be ultraviolet resistant.

Table 9. Clay Liner Specifications

Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	1×10^{-6}
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM-D422	%	Not less than 30
Clay Compaction	ASTM-D2216	%	95% of Std. Proctor Density

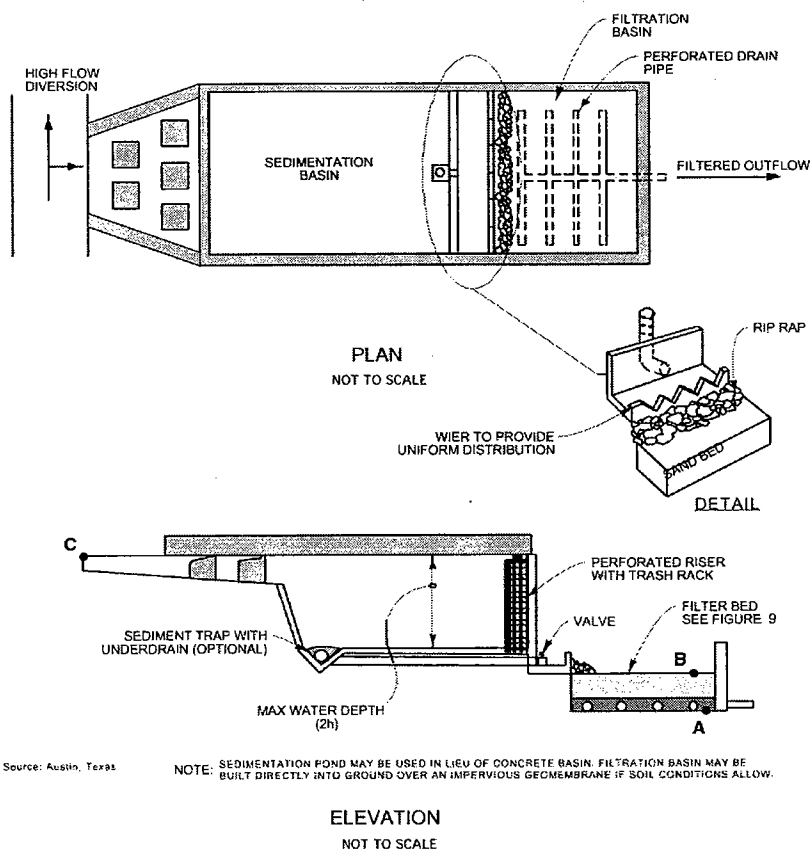


Figure 9: Austin Sand Filter

Source: Ventura County Guidance Manual

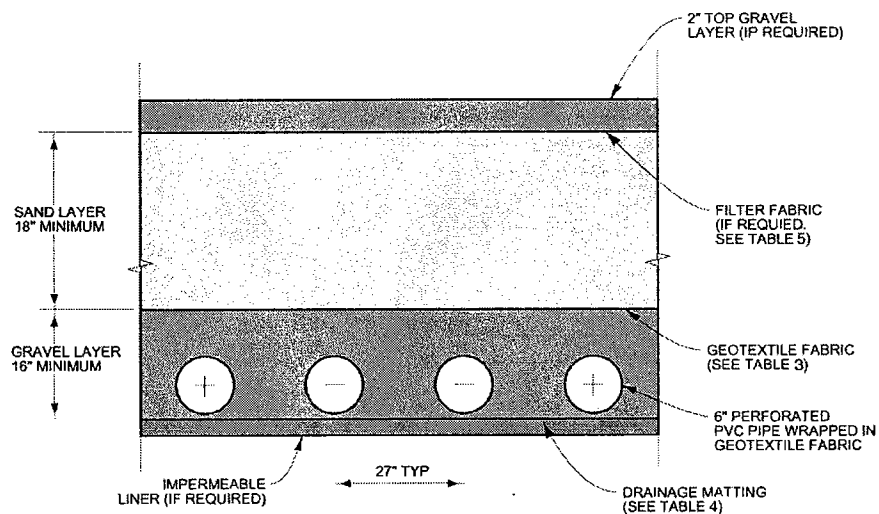


Figure 9A: Filter Bed with Gravel Underdrain

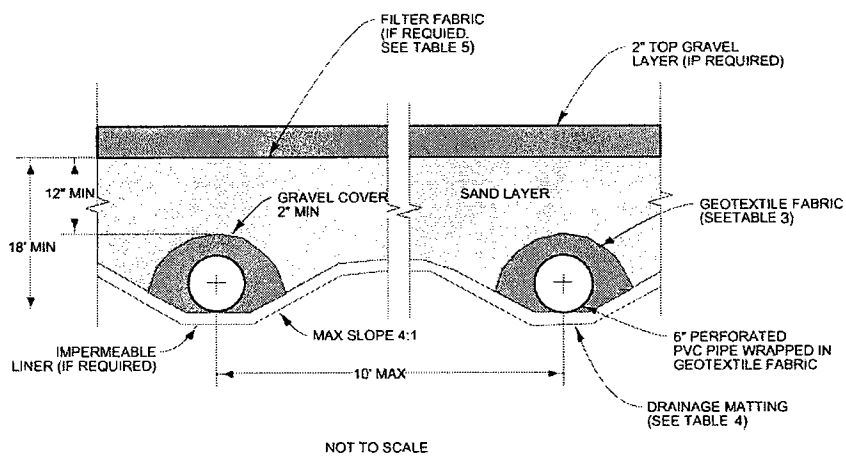


Figure 9B: Filter Bed with Trench Underdrain

Source: *Ventura County Guidance Manual*

Worksheet 7

Design Procedure Form for Austin Sand Filter

Designer: _____
 Company: _____
 Date: _____
 Project: _____
 Location: _____

1. Determine Design Storage Volume
(Use Worksheet 1)

- a. Total Tributary Area (maximum 100)
b. Design Storage Volume, V_{BMP}

$$A_{total} = \underline{\hspace{2cm}} \text{ acres}$$

$$V_{BMP} = \underline{\hspace{2cm}} \text{ ft}^3$$

2. Maximum Water Height in
Sedimentation Basin*

- a. Invert elevation at connection to storm drain system.
b. Sand Filter invert elevation (consider min. grade (1%) from storm drain). Point A, Figure 9.
c. Estimate filter depth or use min. (3').
d. Top elevation of filter bed. Point B, Figure 9.
e. Surface elevation at BMP inlet. Point C, Figure 9.
f. Determine max. allowable height (2h) of water in the sedimentation basin using the elevation difference between points C and B. (min. 2', max. 10')
 $2h = [(C-B) - 1' \text{ Freeboard}]$

$$\text{Elev. Storm Drain} = \underline{\hspace{2cm}} \text{ ft}$$

$$\text{Elev. Pt A} = \underline{\hspace{2cm}} \text{ ft}$$

$$\text{Filter Depth} = \underline{\hspace{2cm}} \text{ ft}$$

$$\text{Elev. Pt B} = \underline{\hspace{2cm}} \text{ ft}$$

$$\text{Elev. Pt C} = \underline{\hspace{2cm}} \text{ ft}$$

$$2h = \underline{\hspace{2cm}} \text{ ft}$$

3. Size Sedimentation Basin

- a. Find Sedimentation Basin Area, A_s
 $A_s = V_{BMP} / (2h)$
b. Determine basin length and width, using a length to width ratio $\geq 2:1$
 $A_s = 2 \times W^2$
length = 2 x width

$$A_s = \underline{\hspace{2cm}} \text{ ft}^2$$

$$\text{width} = \underline{\hspace{2cm}} \text{ ft}$$

$$\text{length} = \underline{\hspace{2cm}} \text{ ft}$$

4. Size Filter Basin

- a. Determine Filter Basin Area, A_f
 $A_f = V_{BMP} / 18$
b. Determine Filter Basin Volume

$$A_f = \underline{\hspace{2cm}} \text{ ft}^2$$

$V_f = A_f \times \text{filter depth (part 2c)}$ c. Determine Required Volume, V_r $V_r = 0.2 \times V_{BMP}$ d. Check if $V_r \geq V_f$? If no, redesign with an increased filter depth or increase filter area.	$V_f = \underline{\hspace{2cm}} \text{ ft}^3$ $V_r = \underline{\hspace{2cm}} \text{ ft}^3$ Check $V_r \geq V_f$ $\underline{\hspace{2cm}}$
Notes: <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	

* Based on these elevations, is there a sufficient elevation drop to allow gravity flow from the outlet of the control measure to the storm drain system? If no, investigate alternative on-site locations for treatment control, consider another treatment control measure more suitable for site conditions, or contact the District to discuss on-site pumping requirements.

Delaware Sand Filter

General

A Delaware sand filter is an underground filter consisting of two parallel concrete trenches divided by a close-spaced wall. Water enters the sedimentation trench through grated covers or a storm drain system. After this permanent pool fills, water overflows through the weir notches at the top of the dividing wall into the filter chamber. This assures that water enters the filter chamber as sheet flow and protects the sand bed from scouring. The permanent pool in the sedimentation chamber is dead storage, which allows heavier sediment to settle out and inhibits resuspension of particles from earlier storms. After passing through the filter bed, water flows into a clearwell area and into the storm drain system. Flows greater than the design volume can enter the sedimentation trench as long as an overflow weir is installed into the clearwell. A Delaware filter can treat tributary areas up to 5 acres.

Delaware Sand Filter Basin Design Criteria:

Design Parameter	Unit	Design Criteria ¹
Design Volume	ft ³	V _{BMP}
Maximum tributary area	acre	5
Weir height between sedimentation chamber and sand filter	in	2" above sand filter bed
Draw-down time	hrs	48 ³
Minimum gravel depth over sand	in	2
Minimum sand depth, ds	in	18
Minimum gravel underdrain depth, dg	in	16
Filter Coefficient, k	ft/day	2
Top layer and underdrain gravel size	in	0.5 to 2-inch diameter stone
Sand size	-	ASTM C33 concrete sand
Slope of top layer	%	0 (horizontal)
Minimum slope of underdrain or bottom of filter	%	0.5%
Minimum size underdrain	-	6" PVC schedule 40
Minimum size diameter perforation	in	3/8
Minimum number of holes per row	-	6
Minimum spacing between rows	in	6
Minimum weephole diameter	in	3
Minimum spacing between weepholes	in	9 (center to center)
Sedimentation chamber and sand filter width	in	18 to 30

¹ Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures

² City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures

³ CA Stormwater BMP Handbook for New Development and Significant Redevelopment

⁴ Riverside County DAMP Supplement A Attachment

Delaware Sand Filter Design Procedure**1. Design Storage Volume**

Use Worksheet 1- Design Procedure Form for Design Storage Volume, V_{BMP} .

2. Maximum Water Depth

Determine maximum allowable height (2h) of water that can pond over the filter based on elevation differences between the filter bed top and the BMP inlet. An overflow weir should be designed to allow flows greater than the design volume to pass into the clearwell.

3. Sand Filter/Sediment Chamber Surface Area

The DSF shell must have the capacity to accept and store the design volume. The dimensions are sized to provide a filter area that processes the design volume in the desired time frame (48 hrs). The areas of the sedimentation chamber A_s and filter bed A_f are typically set equal. The required areas are calculated as follows depending on the maximum depth of water above the filter bed:

- a. If $2h < 2.67$ ft Use: $A_s = A_f = V_{BMP} / (4.1h + 0.9)$
b. If $2h > 2.67$ ft Use: $A_s = A_f = [V_{BMP} \times d_s] / [k (h + d_s) t]$

where: V_{BMP} = Design Volume ft^3
 A_f = filter bed surface area, ft^2
 A_s = sediment chamber surface area, ft^2
 d_s = depth of sand, ft
 k = filter coefficient 0.0833 ft/hr
 h = one half of maximum allowable water depth (2h), ft
 t = 48 hour draw-down time

4. Select sediment chamber and filter width ($W_s = W_f$)

Site considerations usually dictate the final dimensions of the facility. Sediment chambers and filter chambers are normally 18-30 inches wide. Use of standard grates requires a width of 26 inches.

5. Sediment Chamber and Filter Length

$$L_s = L_f = A_f / W_f$$

Round length up as appropriate and compute adjusted Area

$$A_s = A_f = W_f \times L_f$$

6. Storage volume in Filter Voids V_v

$$V_v = A_f \times 0.4(d_s + d_g) \{\text{assume 40\% voids}\}$$

Where d_g = underdrain gravel depth

7. Volume of flow through filter during filling, V_Q

$$V_Q = [k \times A_f \times (d_s + h) \times t_v] / [d_s]$$

Use $t_v = 1$ hour to fill voids

8. Net Volume Required to be Stored in Chambers Awaiting Filtration V_r

$$V_r = V_{BMP} - V_v - V_Q$$

9. Available Storage in Chambers V_a

$$V_a = 2h(A_f + A_s)$$

If $V_a \geq V_r$, proceed with design

If $V_a < V_r$, adjust width and/or length and repeat steps 3-8.

10. Filter Bed

a. Top Gravel Layer

The washed gravel layer at the top of the filter should be two inches thick, composed of stone 0.5 to 2.0 inches in diameter. In areas with high sediment load (TSS concentration >200 mg/L), the two-inch layer of stone on top of the sand filter should be underlain with filter fabric meeting the specifications in Table 8.

b. Sand Layer

The sand layer should be a minimum depth of 18 inches consisting of ASTM C33 concrete sand. A layer of geotextile fabric meeting the specifications in Table 6 must separate the sand and gravel layer below.

c. Gravel Layer

The gravel layer surrounding the collector pipes should be at least 16 inches thick and be composed of 0.5 to 2-inch diameter stone and provide at least two inches of cover over the tops of the drainage pipes.

10. Underdrain Piping

The underdrain piping should follow the same criteria and design as the Austin Sand Filter. Shallow rectangular drain tiles may be fabricated from such materials as fiberglass structural channels, saving several inches of filter depth. Drain tiles should be in two-foot lengths and spaced to provide gaps 1/8-inch less than the smallest gravel sizes on all four sides. Sections of tile may be cast in the dividing wall between the filter and the clearwell to provide shallow outflow orifices.

11. Weep Holes

In addition to the underdrain pipes, weepholes should be installed between the filter chamber and the clearwell to provide relief in case of pipe clogging. The weepholes should be three (3) inches in diameter. Minimum spacing should be nine (9) inches center to center. The openings on the filter side of the dividing wall should be covered to the width of the trench with 12-inch high plastic hardware cloth of ¼ inch mesh or galvanized steel wire, minimum wire diameter 0.03-inch, number 4 mesh

hardware cloth anchored firmly to the dividing wall structure and folded a minimum of six (6) inches back under the bottom stone.

12. Grates and Covers

Grates and cast steel covers are designed to take the same wheel loads as the adjacent pavement. Where possible, use standard grates to reduce costs. Grates and covers should be supported by a galvanized steel perimeter frame.

13. Hoods/Traps

In applications where trapping of hydrocarbons and other floating pollutants is required, large-storm overflow weirs should be equipped with a 10-gauge aluminum hood or commercially available catch basin trap. The hood or trap should extend a minimum of one foot into the permanent pool.

14. Dewatering Drain

A six inch diameter dewatering drain with gate valve is to be installed at the top of the stone/sand filter bed through the partition separating the filter chamber from the clearwell chamber.

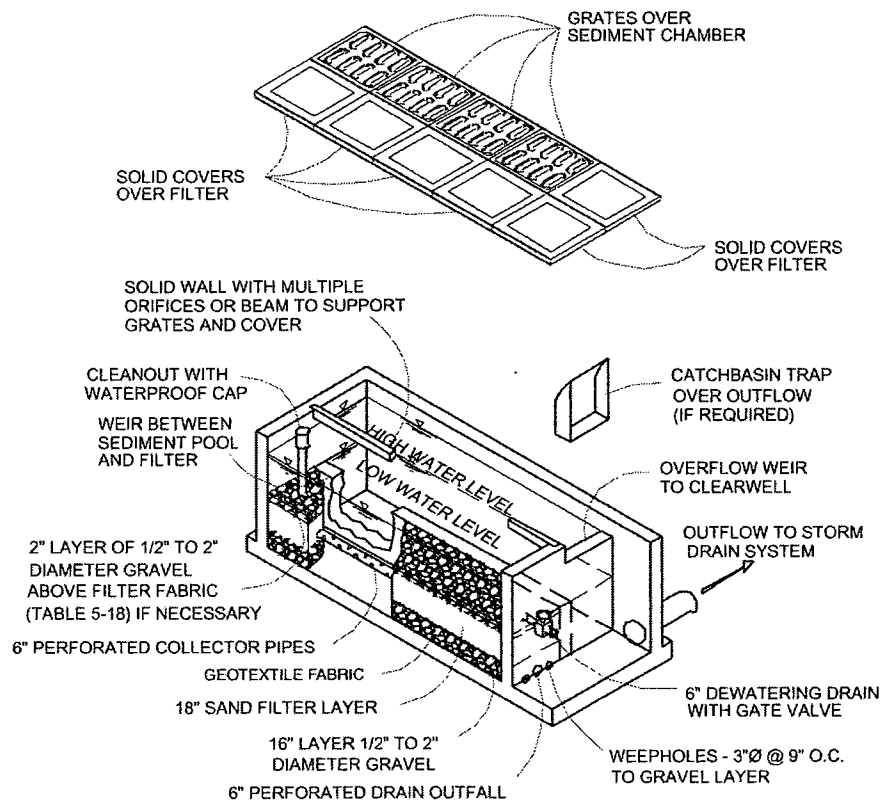


Figure 10: Delaware Sand Filter

Source: Ventura County Guidance Manual

Worksheet 8

Design Procedure Form for Delaware Sand Filter

Designer: _____
 Company: _____
 Date: _____
 Project: _____
 Location: _____

1. Determine Design Storage Volume
(Use Worksheet 1)

- a. Total Tributary Area (maximum 100)
 b. Design Storage Volume, V_{BMP}

$A_{Total} =$ _____ acres
 $V_{BMP} =$ _____ ft^3

2. Maximum Water Height in Sedimentation Basin*

- a. Invert elevation at connection to storm drain system.
 b. Sand Filter invert elevation (consider min. grade (1%) from storm drain).
 c. Estimate filter depth or use min. (3').
 d. Top elevation of filter bed.
 e. Surface elevation at BMP inlet.
 f. Determine max. allowable height (2h) of water that can pond over the filter using the elevation difference between the filter bed top and the BMP inlet.
 $2h = [(C-B) - 1' \text{ Freeboard}]$

Elev. Storm Drain = _____ ft

Elev. Filter Bottom = _____ ft

Filter Depth = _____ ft

Filter bed top elev. (pt B) = _____ ft

BMP inlet Elev. (pt C) = _____ ft

$2h =$ _____ ft

3. Minimum Surface Area of the Chambers

If $2h < 2.67$ feet (2'-8")

$$A_f = A_s = V_{BMP} / (4.1h + 0.9)$$

If $2h > 2.67$ feet (2'-8")

$$A_f = A_s = [V_{BMP} \times d_s] / [k(h+d_s)t_d]$$

- a. Sand bed depth, d_s
 b. Filter Coefficient, k
 c. Draw-down time, t
 d. $\frac{1}{2}$ max. allowable water depth over filter, h
 e. Sediment Chamber Area A_s , and Filter Surface Area A_f

$d_s =$ _____ ft

$k =$ _____ ft/hr

$t =$ _____ hr

$h =$ _____ ft

A_s and $A_f =$ _____ ft^2

4. Sediment Chamber and Filter Dimensions a. Select width ($W_s = W_f = 18''$ to $30''$) b. Filter length ($L_s = L_f = A_{fm}/W_f$) c. Adjusted length (rounded) d. Adjusted area ($A_s = A_f = W_f \times L_f$)	$W_s = W_f =$ _____ ft $L_s = L_f =$ _____ ft $L_s = L_f =$ _____ ft $A_s = A_f =$ _____ ft ²
5. System Storage Volume a. Storage in filter voids ($V_v = A_f \times 0.4(d_g + d_s)$) b. Volume of flow through filter ($V_Q = k \times A_f(d_s + h) \text{ 1hr} / d_s$) c. Required net storage ($V_r = V_{BMP} - V_v - V_Q$) d. Available storage ($V_a = 2h(A_f + A_s)$) If $V_a \geq V_r$, sizing is complete If $V_a < V_r$, repeat steps 4 and 5	$V_v =$ _____ ft ³ $V_Q =$ _____ ft ³ $V_r =$ _____ ft ³ $V_a =$ _____ ft ³ Check $V_r \geq V_a$ _____
Notes: 	

* Based on these elevations, is there a sufficient elevation drop to allow gravity flow from the outlet of the control measure to the storm drain system? If no, investigate alternative on-site locations for treatment control, consider another treatment control measure more suitable for site conditions, or contact the District to discuss on-site pumping requirements.

Grassed Swales

General

A Grass swale is a wide, shallow densely vegetated channel that treats stormwater runoff as it is slowly conveyed into a downstream system. These swales have very shallow slopes in order to allow maximum contact time with the vegetation. The depth of water of the design flow should be less than the height of the vegetation. Contact with vegetation improves water quality by plant uptake of pollutants, removal of sediment, and an increase in infiltration. Overall the effectiveness of a grass swale is limited and it is recommended that they are used in combination with other BMPs.

This BMP is not appropriate for industrial sites or locations where spills occur. Important factors to consider when using this BMP include: natural channelization should be avoided to maintain this BMP's effectiveness, large areas must be divided and treated with multiple swales, thick cover is required to function properly, impractical for steep topography, and not effective with high flow velocities.

Grass Swale Design Criteria:

Design Parameter	Unit	Design Criteria
Design Flow	cfs	Q_{BMP}
Minimum bottom width	ft	2 ft^2
Maximum channel side slope	H:V	3:1 ²
Minimum slope in flow direction	%	0.2 (provide underdrains for slopes < 0.5) ¹
Maximum slope in flow direction	%	2.0 (provide grade-control checks for slopes > 2.0) ¹
Maximum flow velocity	ft/sec	1.0 (based on Manning $n = 0.20$) ¹
Maximum depth of flow	inches	3 to 5 (1 inch below top of grass) ¹
Minimum contact time	minutes	7 ¹
Minimum length	ft	Sufficient length to provide minimum contact time ¹
Vegetation	-	Turf grass or approved equal ¹
Grass height	inches	4 to 6 (mow to maintain height) ¹

¹ Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures

² City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures

³ CA Stormwater BMP Handbook for New Development and Significant Redevelopment

⁴ Riverside County DAMP Supplement A Attachment

Grass Swale Design Procedure

1. Design Flow
Use Worksheet 2 - Design Procedure Form for Design Flow Rate, Q_{BMP} .
2. Swale Geometry
 - a. Determine bottom width of swale (must be at least 2 feet).
 - b. Determine side slopes (must not be steeper than 3:1; flatter is preferred).
 - c. Determine flow direction slope (must be between 0.2% and 2%; provide underdrains for slopes less than 0.5% and provide grade control checks for slopes greater than 2.0%)
3. Flow Velocity
Maximum flow velocity should not exceed 1.0 ft/sec based on a Mannings $n = 0.20$
4. Flow Depth
Maximum depth of flow should not exceed 3 to 5 inches based on a Manning $n = 0.20$
5. Swale Length
Provide length in the flow direction sufficient to yield a minimum contact time of 7 minutes.
$$L = (7 \text{ min}) \times (\text{flow velocity ft/s}) \times (60 \text{ sec/min})$$
6. Vegetation
Provide irrigated perennial turf grass to yield full, dense cover. Mow to maintain height of 4 to 6 inches.
7. Provide sufficient flow depth for flood event flows to avoid flooding of critical areas or structures.

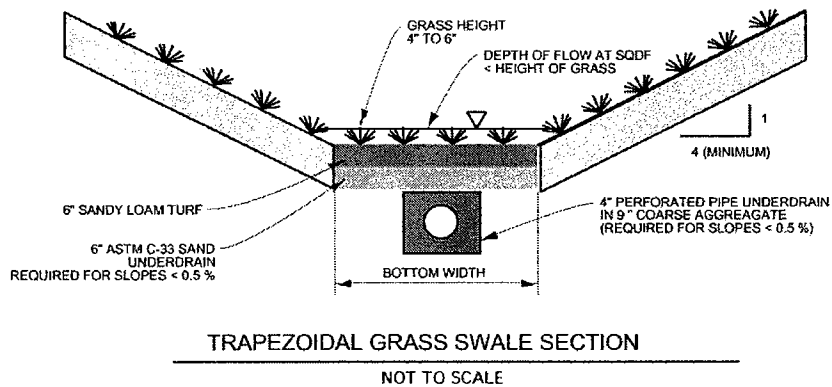
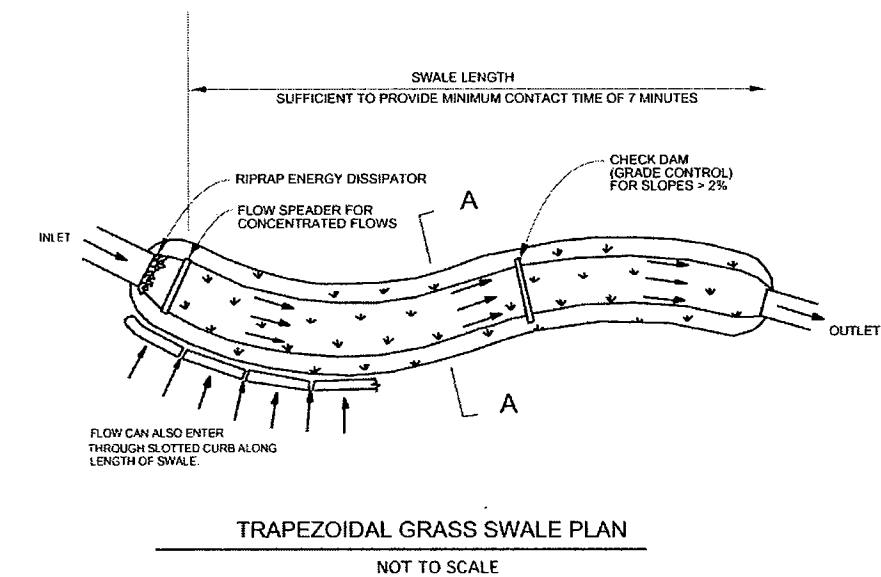


Figure 11: Grassed Swale

Source: Ventura County Guidance Manual

Worksheet 9

Design Procedure Form for Grassed Swale

Designer: _____
 Company: _____
 Date: _____
 Project: _____
 Location: _____

1. Determine Design Flow (Use Worksheet 2)	$Q_{BMP} = \underline{\hspace{2cm}}$ cfs
2. Swale Geometry a. Swale bottom width (b) b. Side slope (z) c. Flow direction slope (s)	$b = \underline{\hspace{2cm}}$ ft $z = \underline{\hspace{2cm}}$ $s = \underline{\hspace{2cm}}$ %
3. Design flow velocity (Manning $n = 0.2$)	$v = \underline{\hspace{2cm}}$ ft/s
4. Depth of flow (D)	$D = \underline{\hspace{2cm}}$ ft
5. Design Length (L) $L = (7 \text{ min}) \times (\text{flow velocity, ft/sec}) \times 60$	$L = \underline{\hspace{2cm}}$ ft
6. Vegetation (describe)	_____ _____ _____
8. Outflow Collection (check type used or describe "other")	<input type="checkbox"/> Grated Inlet <input type="checkbox"/> Infiltration Trench <input type="checkbox"/> Underdrain <input type="checkbox"/> Other _____
Notes: _____ _____ _____ _____ _____ _____	

Filter Strips

General

Filter Strips are uniformly graded areas of dense vegetation designed to treat sheet flow stormwater runoff. Pollutants are removed by filtering and through settling of sediment and other solid particles as the design flow passes through (not over) the vegetation. Filter strips are usually as wide as the tributary area and must be long enough in the flow direction to adequately treat the runoff. Concentrated flows are redistributed uniformly across the top of the strip with a level spreader. A grass swale, sand filter, or infiltration BMP is recommended in conjunction with a filter strip.

This BMP is not appropriate for industrial sites or locations where spills occur. Important factors to consider when using this BMP include: thick vegetated cover is required to work properly, and not effective if length and flow characteristics are not met.

Filter Strip Design Criteria:

Design Parameter	Unit	Design Criteria
Design Flow	cfs	Q_{BMP}^1
Maximum tributary area	acres	5^1
Maximum linear unit application rate (q_a)	cfs/ft x width	0.005^1
Minimum width (normal to flow)	ft	$(Q_{BMP}) / (q_a)^1$
Minimum length (flow direction)	ft	15^1
Maximum slope (flow direction)	%	4^1
Vegetation	-	Turf grass (irrigated) or approved equal ¹
Minimum grass height	inches	2^1
Maximum grass height	inches	4 (typical) or as required to prevent lodging or shading ¹
Level Spreader	-	A level spreader must be applied to the flows before reaching the strip ⁴
Recommendation	-	This BMP is recommended in conjunction with a grass swale, sand filter, or infiltration BMP ³

¹ Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures

² City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures

³ CA Stormwater BMP Handbook for New Development and Significant Redevelopment

⁴ Riverside County DAMP Supplement A Attachment

Filter Strip Design Procedure

1. Design Flow
Use Worksheet 2 - Design Procedure Form for Design Flow Rate, Q_{BMP} .
2. Minimum Width
Calculate minimum width of the grass strip filter (W_m) normal to flow direction:
$$W_m = (Q_{BMP})/(q_a)$$
$$W_m = (Q_{BMP})/0.005 \text{ cfs/ft (minimum)}$$
3. Minimum Length
Length of the grass strip filter (L_m) in the direction of flow shall not be less than 15 feet.
$$L_m = 15 \text{ feet (minimum)}$$
4. Maximum Slope
Slope of the ground in the direction of flow shall not be greater than 4 percent.
5. Flow Distribution
Incorporate a device at the upstream end of the filter strip to evenly distribute flows along the top width, such as slotted curbing, modular block porous pavement, or other spreader devices. Concentrated flow delivered to the filter strip must be distributed evenly by means of a level spreader of similar concept.
6. Vegetation
Provide irrigated perennial turf grass to yield full, dense cover. Submit a Landscape Plan for stormwater agency review. Plan shall be prepared by a landscape or other appropriate specialist and shall include a site plan showing location and type of vegetation. Mow grass to maintain height approximately between 2 and 4 inches.
7. Outflow Collection
Provide a means for outflow collection and conveyance (e.g. grass channel/swale, storm sewer, street gutter).

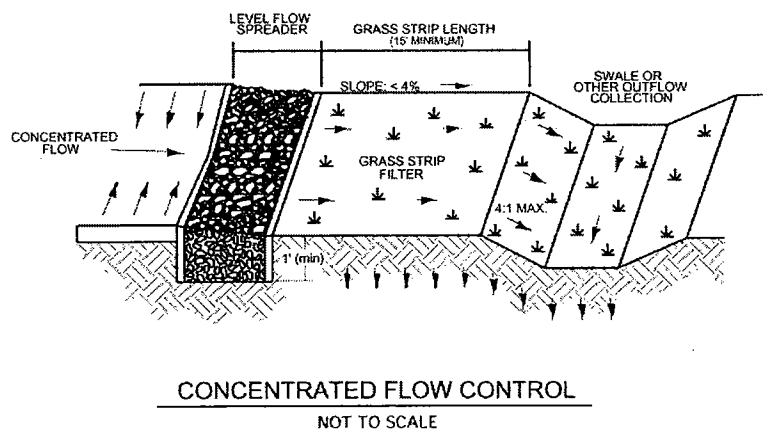
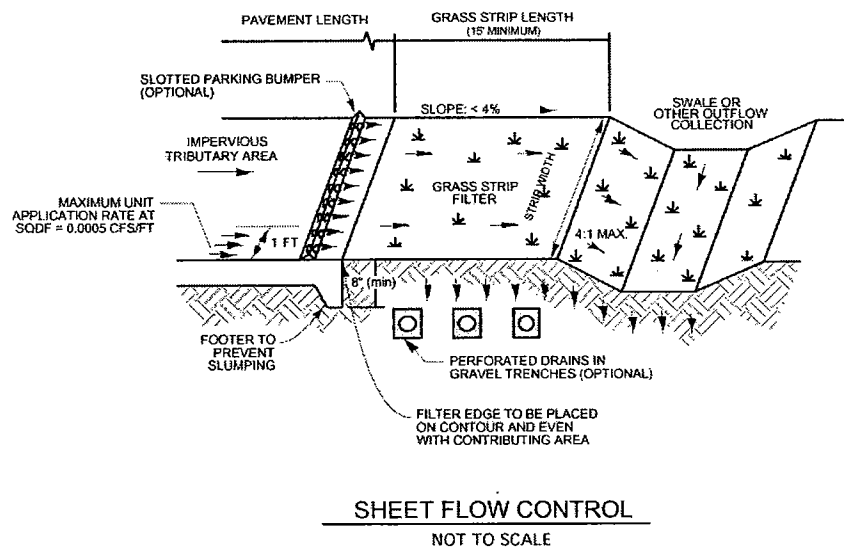


Figure 12: Grass Filter Strip

Source: Ventura County Guidance Manual

Worksheet 10

Design Procedure Form for Filter Strip	
Designer: _____ Company: _____ Date: _____ Project: _____ Location: _____	
1. Determine Design Flow (Use Worksheet 2)	$Q_{BMP} = \underline{\hspace{2cm}}$ cfs
2. Design Width $W_m = (Q_{BMP})/0.005$ cfs/ft	$W_m = \underline{\hspace{2cm}}$ ft
3. Design Length (15 ft minimum)	$L_m = \underline{\hspace{2cm}}$ ft
4. Design Slope (4 % maximum)	$S_D = \underline{\hspace{2cm}}$ %
5. Flow Distribution (check type used or describe "other")	<input type="checkbox"/> slotted curbing <input type="checkbox"/> Modular Block Porous Pavement <input type="checkbox"/> Level Spreader <input type="checkbox"/> other _____
6. Vegetation (describe)	_____ _____ _____
5. Outflow Collection (check type used or describe "other")	<input type="checkbox"/> Grass Swale <input type="checkbox"/> Street Gutter <input type="checkbox"/> Storm Drain <input type="checkbox"/> Underdrain <input type="checkbox"/> Other _____
Notes: _____ _____ _____ _____ _____ _____	

Water Quality Inlets

General

A water quality inlet is a device that removes oil and grit from stormwater runoff before the water enters the stormdrain system. It consists of one or more chambers that promote sedimentation of coarse materials and separation of free oil from stormwater. Manufacturers have created a variety of configurations to accomplish this. A specific model can be selected from the manufacturer based on the design flow rate. A water quality inlet is generally used for pretreatment before discharging into another type of BMP.

Water Quality Inlet Design Criteria:

Design Parameter	Unit	Design Criteria
Design Flow	cfs	Q_{BMP}
Maximum Tributary Area	acres	1 ⁴
Clean-out Schedule	-	At least twice per year ⁴

1 Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures

2 City of Modesto's Guidance Manual for New Development Stormwater Quality Control Measures

3 CA Stormwater BMP Handbook for New Development and Significant Redevelopment

4 Riverside County DAMP Supplement A Attachment

Water Quality Inlet Design Procedure

1. Design Flow

Use Worksheet 2 - Design Procedure Form for Design Flow Rate, Q_{BMP} .

2. Select Model

Select a water quality inlet model that will appropriately treat the design flow using manufacturer specifications.

3. Maintenance Requirements

In order to maintain its ability to treat stormwater, the inlet must be cleaned at least twice a year. Arrangements should be made to do this.

Worksheet 11

Design Procedure Form for Water Quality Inlets

Designer: _____
Company: _____
Date: _____
Project: _____
Location: _____

1. Determine Design Flow Rate
(Use Worksheet 2)

$Q_{BMP} =$ _____ cfs

2. Water Quality Inlet

Manufacturer Name _____
Model _____
Flow Capacity of Model _____

Make _____
Model _____
Capacity _____ cfs

Please include a technical sheet from
the manufacturer with information on
this model.

Notes:

REFERENCES

California Stormwater Quality Association, January 2003. *Stormwater Best Management Practice Handbook for New Development and Redevelopment*, prepared by Camp Dresser & McKee and Larry Walker Associates

City of Modesto, Operations and Maintenance Department, January 2001. *Guidance Manual for New Development Stormwater Quality Control Measures*

Attachment to Supplement "A" of the Riverside County Drainage Area Management Plans , April 1996. *Selection and Design of Stormwater Quality Controls*, prepared by Riverside County Flood Control and Water Conservation District

Ventura Countywide Stormwater Quality Management Program July 2002. *Technical Guidance Manual for Stormwater Quality Control Measures*

APPENDIX A

Slope of the Design Volume Curve

INSERT

Slope of the Design Volume Curve

HERE

APPENDIX B

BMP Design Examples

1. Extended Detention Basin
2. Grass Swales
3. Austin Sand Filter
4. Infiltration Basin
5. Filter Strip

Exhibit D

Runoff Coefficients for Urban Soil Types

Runoff Coefficients for an Intensity = 0.2 inch/hour for Urban Soil Types*

Impervious %	A Soil RI = 32	B Soil RI = 56	C Soil RI = 69	D Soil RI = 75
0 (Natural)	0.06	0.14	0.23	0.28
5	0.10	0.18	0.26	0.31
10	0.14	0.22	0.29	0.34
15	0.19	0.26	0.33	0.37
20 (1-Acre)	0.23	0.30	0.36	0.40
25	0.27	0.33	0.39	0.43
30	0.31	0.37	0.43	0.47
35	0.35	0.41	0.46	0.50
40 (1/2-Acre)	0.40	0.45	0.50	0.53
45	0.44	0.48	0.53	0.56
50 (1/4-Acre)	0.48	0.52	0.56	0.59
55	0.52	0.56	0.60	0.62
60	0.56	0.60	0.63	0.65
65 (Condominiums)	0.61	0.64	0.66	0.68
70	0.65	0.67	0.70	0.71
75 (Mobilehomes)	0.69	0.71	0.73	0.74
80 (Apartments)	0.73	0.75	0.77	0.78
85	0.77	0.79	0.80	0.81
90 (Commercial)	0.82	0.82	0.83	0.84
95	0.86	0.86	0.87	0.87
100	0.90	0.90	0.90	0.90

*Complete District's standards can be found in the Riverside County Flood Control Hydrology Manual

Exhibit E

Typical Requirements for Common Maintenance Mechanisms

Typical Requirements for Common Maintenance Mechanisms

1. **Public entity maintenance:** The Co-Permittee may approve a public or acceptable quasi-public entity (e.g., the Riverside County Flood Control District, or annex to an existing assessment district, an existing utility district, a state or federal resource agency, or a conservation conservancy) to assume responsibility for operation, maintenance, repair and replacement of the BMP. Unless otherwise acceptable to individual Co-Permittees, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the Co-Permittees may seek protection from liability by appropriate releases and indemnities.

The Co-Permittee shall have the authority to approve Urban Runoff BMPs proposed for transfer to any other public entity within its jurisdiction before installation. The Co-Permittee shall be involved in the negotiation of maintenance requirements with any other public entities accepting maintenance responsibilities within their respective jurisdictions; and in negotiations with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. The Co-Permittee must be identified as a third party beneficiary empowered to enforce any such maintenance agreement within their respective jurisdictions.

2. **Project proponent agreement to maintain Urban Runoff BMPs:** The Co-Permittee may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the Urban Runoff BMP as necessary into perpetuity. Security or a funding mechanism with a "no sunset" clause may be required.
3. **Assessment districts:** The Co-Permittee may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for Urban Runoff BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.
4. **Lease provisions:** In those cases where the Co-Permittee holds title to the land in question, and the land is being leased to another party for private or public use, the Co-Permittee may assure Urban Runoff BMP maintenance, repair and replacement through conditions in the lease.
5. **Conditional use permits:** For discretionary projects only, the Co-Permittee may assure maintenance of Urban Runoff BMPs through the inclusion of maintenance conditions in the conditional use permit. Security may be required.
6. **Alternative mechanisms:** The Co-Permittee may accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

Exhibit F
Sample Covenant and Agreement

Example Covenant and Agreement

Water Quality Management Plan and Urban Runoff BMP Transfer, Access and Maintenance Agreement (adapted from documents from the Ventura County Stormwater Management Program)

Recorded at the request of:

City of _____

After recording, return to:

City of _____

City Clerk _____

**Water Quality Management Plan and Urban Runoff BMP
Transfer, Access and Maintenance Agreement**

OWNER: _____

PROPERTY ADDRESS: _____

APN: _____

THIS AGREEMENT is made and entered into in

_____, California, this _____ day of

_____, by and between

_____, herein after

referred to as "Owner" and the CITY OF _____, a municipal corporation, located in the County of Riverside, State of California hereinafter referred to as "CITY";

WHEREAS, the Owner owns real property ("Property") in the City of

_____, County of Riverside, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference;

WHEREAS, at the time of initial approval of development project known as

_____ within the Property described herein, the City required the project to employ Best Management Practices, hereinafter referred to as "BMPs," to minimize pollutants in urban runoff;

WHEREAS, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, on file with the City, hereinafter referred to as "WQMP", to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff;

WHEREAS, said WQMP has been certified by the Owner and reviewed and approved by the City;

WHEREAS, said BMPs, with installation and/or implementation on private property and draining only private property, are part of a private facility with all maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. Owner hereby provides the City of City's designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by City's Director of Public Works no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.
2. Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full.
4. The City may require the owner to post security in form and for a time period satisfactory to the city to guarantee the performance of the obligations state herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Director may withdraw any previous Urban Runoff-related approval with respect to the property on which BMPs have been installed and/or implemented until such time as Owner repays to City its reasonable costs incurred in accordance with paragraph 3 above.
5. This agreement shall be recorded in the Office of the Recorder of Riverside County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.
6. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.
7. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.
8. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.
9. Time is of the essence in the performance of this Agreement.
10. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

IF TO CITY:

IF TO OWNER:

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

APPROVED AS TO FORM:

OWNER:

 City Attorney

 Name

 CITY OF

 Title

 Name

OWNER:

 Title

 Name

ATTEST:

 Title

 City Clerk Date

NOTARIES ON FOLLOWING PAGE

EXHIBIT A
(Legal Description)

EXHIBIT B
(Map/Illustration)

Exhibit G
Glossary

Best Management Practices (BMPs) – Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the U.S. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of MS4 permits, BMPs are typically used in place of numeric effluent limits.

Hydrologic Conditions of Concern – Changes caused by a New Development or Redevelopment Project to Urban Runoff flow rates, velocities, durations and/or volumes that cause significant downstream erosion beyond the pre-development condition or cause significant adverse impacts to stream habitat.

Municipal Separate Storm Sewer System (MS4) – An MS4 is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, natural drainage features or channels, modified natural channels, man-made channels, or storm drains): (i) Owned or operated by a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under Section 208 of the CWA that discharges to Waters of the U.S.; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the POTW as defined at 40 CFR 122.26.

Historic and current developments make use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and a receiving water.

New Development – In the Santa Ana Region of Riverside County: The categories of development identified in subsections VIII.B.1.b of Order No. R8-2002-0011. New developments do not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of a facility, nor do they include emergency new developments required to protect public health and safety. Dischargers should confirm with Regional Board staff whether or not a particular routine maintenance activity is subject to Order No. R8-2002-0011.

In the Santa Margarita Region of Riverside County: The categories of development identified in Provision F. 2.b.1 of San Diego Region RWQCB Order R9-2004-001.

Pollutants of Concern – For the purposes of the WQMP, those Urban Runoff pollutants generated by a New Development or Redevelopment project. Pollutants of Concern may include urban runoff pollutants typically associated with the proposed land use, legacy pollutants that are associated with the project site, project related pollutants for which Receiving Waters downstream of and proximate to the project are listed as impaired under CWA section 303(d), and pollutants commonly associated with Urban Runoff. Please see the Santa Ana, Santa Margarita, or Whitewater River NPDES MS4 Permit, as appropriate, for a full list of pollutants commonly associated with Urban Runoff.

Receiving Water(s) – The receiving waters within the Permit Area

Santa Ana Region Co-Permittees – The County of Riverside and the Cities of Beaumont, Calimesa, Canyon Lake, Corona, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Norco, Perris, Riverside, and San Jacinto.

Santa Margarita Region Co-Permittees – The County of Riverside and the Cities of Murrieta and Temecula.

Significant Redevelopment – In the Santa Ana Region of Riverside County: As defined in Section VIII.B.1.a of Order No. R8-2002-0011, Significant Redevelopment is the addition or creation of 5,000 square feet or more of impervious surface on an existing developed site. This includes, but is not limited to, construction of additional buildings and/or structures, extension of the existing footprint of a building, construction of impervious or compacted soil parking lots. Where Significant Redevelopment results in an increase of less than 50 percent of the existing impervious surfaces of an existing developed site, and the existing developed site received its discretionary land use approvals prior to the adoption of the WQMP, the WQMP would apply only to the addition, and not the existing development. Significant Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, the original purpose of the constructed facility or emergency actions required to protect public health and safety.

In the Santa Margarita Region of Riverside County: Significant Redevelopment is defined in Provision F. 2.b as redevelopment projects that create, add or replace at least 5,000 square feet of impervious surfaces on an already developed New Development category site. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior maintenance activity; and land disturbing activities related with structural or impervious surfaces.

Site Design BMPs – Any project design feature that reduces the creation or severity of potential pollutant sources or reduces the alteration of the project site's natural flow regime. Redevelopment projects that are undertaken to remove pollutant sources (such as existing surface parking lots and other impervious surfaces) or to reduce the need for new roads and other impervious surfaces (as compared to conventional or low-density new development) by incorporating higher densities and/or mixed land uses into the project design, are also considered site design BMPs.

Source Control BMPs – In general, activities or programs to educate the public or provide low cost non-physical solutions, as well as facility design or practices aimed to limit the contact between pollutant sources and Urban Runoff or authorized non-storm water. Examples include activity schedules, prohibitions of practices, street sweeping, facility maintenance, detection and elimination of illicit connections and illegal dumping, and other non-structural measures. Facility design examples include providing attached lids to trash containers, or roof or awning over material and trash storage areas to prevent direct contact between water and pollutants. Additional examples are provided in Section 4 of Supplement A to the DAMP dated April 1996.

Structural BMPs – Physical facilities or controls which may include secondary containment, treatment measures, (e.g. first flush diversion, detention/retention basins, and oil/grease separators), run-off controls (e.g., grass swales, infiltration trenches/basins, etc.), and engineering and design modification of existing structures. Additional examples are provided in Section 4 of Supplement A to the Riverside County DAMP dated April 1996.

Treatment Control BMPs – Any engineered system designed and constructed to remove pollutants from urban runoff. Pollutant removal is achieved by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Urban Runoff – In the Santa Ana Region of Riverside County: Urban Runoff includes those discharges from residential, commercial, industrial, and construction areas within the Permit Area and excludes discharges from feedlots, dairies, farms, and open space. Urban Runoff discharges consist of storm water and non-storm water surface runoff from drainage sub-areas with various, often mixed, land uses within

all of the hydrologic tributary areas that discharge into the Waters of the U.S. In addition to Urban Runoff, the MS4s regulated by Order No. R8-2002-0011 receive flows from agricultural activities, open space, state and federal properties and other non-urban land uses not under the control of the Permittees. The quality of the discharges from the MS4s varies considerably and is affected by, among other things, past and present land use activities, basin hydrology, geography and geology, season, the frequency and duration of storm events, and the presence of past or present illegal and allowed disposal practices and illicit connections. The Permittees lack legal jurisdiction over storm water discharges into their respective MS4s from agricultural activities, California and federal facilities, utilities and special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by or under the jurisdiction of the Regional Board. The Regional Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. Similarly, certain activities that generate pollutants present in Urban Runoff are beyond the ability of the Permittees to eliminate. Examples of these include operation of internal combustion engines, atmospheric deposition, brake pad wear, tire wear, residues from lawful application of pesticides, nutrient runoff from agricultural activities, and leaching of naturally occurring minerals from local geography.

In the Santa Margarita Region of Riverside County: All flows in a stormwater conveyance system and consists of the following components: (1) storm water (wet weather flows) and (2) non-stormwater illicit discharges (dry weather flows).

Waters of the United States – Waters of the U.S. can broadly be defined as navigable surface waters and all tributary surface waters to navigable surface waters. Groundwater is not considered Waters of the U.S. As defined in 40 CFR 122.2, the Waters of the U.S. are defined as: (a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate “wetlands;” (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used I interstate or foreign travelers for recreation or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as Waters of the U.S. under this definition; (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) “wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area’s status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding the Clean Water Act jurisdiction remains with the United States Environmental Protection Agency.



Linda S. Adams
*Secretary for
Environmental Protection*

State Water Resources Control Board

Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5537
Mailing Address: P.O. Box 1977 • Sacramento, California • 95812-1977
FAX (916) 341-5543 • Internet Address: <http://www.waterboards.ca.gov/stormwtr/index.html>



Arnold Schwarzenegger
Governor

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (GENERAL PERMIT) WATER QUALITY ORDER 99-08-DWQ

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Secretary for
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Arnold Schwarzenegger
Governor

CHECKLIST FOR SUBMITTING A NOTICE OF INTENT

In order for the State Water Resources Control Board to expeditiously process your Notice of Intent (NOI), the following items must be submitted to either of the addresses indicated below:

1. _____ NOI (please keep a copy for your files) with all applicable sections completed and original signature of the landowner or signatory agent;
2. _____ Check made out to the "State Water Resources Control Board"
Fee is (\$200 + \$20/acre) plus 18.5% surcharge. See reverse for listing of fees by acre. The fee is based on the "Total Acres to be Disturbed" for the life of the project.
3. _____ Site Map of the facility (see NOI instructions). DO NOT SEND BLUEPRINTS

U.S. Postal Service Address

State Water Resources Control Board
Division of Water Quality
Attn: Storm Water Section
P.O. Box 1977
Sacramento, CA 95812-1977

Overnight Mailing Address

State Water Resources Control Board
Division Of Water Quality
Attn: Storm Water, 15th Floor
1001 I Street
Sacramento, CA 95814

NOIs are processed in the order they are received. A NOI receipt letter will be mailed to the land owner within approximately two weeks. Incomplete NOI submittals will be returned to the landowner's address within the same timeframe and will specify the reason(s) for return. If you need a receipt letter by a specific date (for example, to provide to a local agency), we advise that you submit your NOI thirty (30) days prior to the date the receipt letter is needed.

Please do not call us to verify your NOI status. A copy of your NOI receipt letter will be available on our web page within twenty-four (24) hours of processing. Go to:
<http://www.waterboards.ca.gov/stormwtr/databases.html> to retrieve an electronic copy of your NOI receipt letter. If you have any questions regarding this matter, please contact us at (916) 341-5537.

<u>Acres</u>	<u>Fee</u>	<u>18.5% Surcharge</u>	<u>Total Fee</u>
0	\$200.00	\$37	\$237
1	\$220.00	\$41	\$261
2	\$240.00	\$44	\$284
3	\$260.00	\$48	\$308
4	\$280.00	\$52	\$332
5	\$300.00	\$56	\$356
6	\$320.00	\$59	\$379
7	\$340.00	\$63	\$403
8	\$360.00	\$67	\$427
9	\$380.00	\$70	\$450
10	\$400.00	\$74	\$474
11	\$420.00	\$78	\$498
12	\$440.00	\$81	\$521
13	\$460.00	\$85	\$545
14	\$480.00	\$89	\$569
15	\$500.00	\$93	\$593
16	\$520.00	\$96	\$616
17	\$540.00	\$100	\$640
18	\$560.00	\$104	\$664
19	\$580.00	\$107	\$687
20	\$600.00	\$111	\$711
21	\$620.00	\$115	\$735
22	\$640.00	\$118	\$758
23	\$660.00	\$122	\$782
24	\$680.00	\$126	\$806
25	\$700.00	\$130	\$830
26	\$720.00	\$133	\$853
27	\$740.00	\$137	\$877
28	\$760.00	\$141	\$901
29	\$780.00	\$144	\$924
30	\$800.00	\$148	\$948
31	\$820.00	\$152	\$972
32	\$840.00	\$155	\$995
33	\$860.00	\$159	\$1,019
34	\$880.00	\$163	\$1,043
35	\$900.00	\$167	\$1,067
36	\$920.00	\$170	\$1,090
37	\$940.00	\$174	\$1,114
38	\$960.00	\$178	\$1,138
39	\$980.00	\$181	\$1,161
40	\$1,000.00	\$185	\$1,185
41	\$1,020.00	\$189	\$1,209
42	\$1,040.00	\$192	\$1,232
43	\$1,060.00	\$196	\$1,256
44	\$1,080.00	\$200	\$1,280
45	\$1,100.00	\$204	\$1,304
46	\$1,120.00	\$207	\$1,327
47	\$1,140.00	\$211	\$1,351
48	\$1,160.00	\$215	\$1,375
49	\$1,180.00	\$218	\$1,398
50	\$1,200.00	\$222	\$1,422

<u>Acres</u>	<u>Fee</u>	<u>18.5% Surcharge</u>	<u>Total Fee</u>
51	\$1,220.00	\$226	\$1,446
52	\$1,240.00	\$229	\$1,469
53	\$1,260.00	\$233	\$1,493
54	\$1,280.00	\$237	\$1,517
55	\$1,300.00	\$241	\$1,541
56	\$1,320.00	\$244	\$1,564
57	\$1,340.00	\$248	\$1,588
58	\$1,360.00	\$252	\$1,612
59	\$1,380.00	\$255	\$1,635
60	\$1,400.00	\$259	\$1,659
61	\$1,420.00	\$263	\$1,683
62	\$1,440.00	\$266	\$1,706
63	\$1,460.00	\$270	\$1,730
64	\$1,480.00	\$274	\$1,754
65	\$1,500.00	\$278	\$1,778
66	\$1,520.00	\$281	\$1,801
67	\$1,540.00	\$285	\$1,825
68	\$1,560.00	\$289	\$1,849
69	\$1,580.00	\$292	\$1,872
70	\$1,600.00	\$296	\$1,896
71	\$1,620.00	\$300	\$1,920
72	\$1,640.00	\$303	\$1,943
73	\$1,660.00	\$307	\$1,967
74	\$1,680.00	\$311	\$1,991
75	\$1,700.00	\$315	\$2,015
76	\$1,720.00	\$318	\$2,038
77	\$1,740.00	\$322	\$2,062
78	\$1,760.00	\$326	\$2,086
79	\$1,780.00	\$329	\$2,109
80	\$1,800.00	\$333	\$2,133
81	\$1,820.00	\$337	\$2,157
82	\$1,840.00	\$340	\$2,180
83	\$1,860.00	\$344	\$2,204
84	\$1,880.00	\$348	\$2,228
85	\$1,900.00	\$352	\$2,252
86	\$1,920.00	\$355	\$2,275
87	\$1,940.00	\$359	\$2,299
88	\$1,960.00	\$363	\$2,323
89	\$1,980.00	\$366	\$2,346
90	\$2,000.00	\$370	\$2,370
91	\$2,020.00	\$374	\$2,394
92	\$2,040.00	\$377	\$2,417
93	\$2,060.00	\$381	\$2,441
94	\$2,080.00	\$385	\$2,465
95	\$2,100.00	\$389	\$2,489
96	\$2,120.00	\$392	\$2,512
97	\$2,140.00	\$396	\$2,536
98	\$2,160.00	\$400	\$2,560
99	\$2,180.00	\$403	\$2,583
>100	\$2,200.00	\$407	\$2,607

FACT SHEET
FOR
WATER QUALITY ORDER 99-08-DWQ

STATE WATER RESOURCES CONTROL BOARD (SWRCB)
901 P STREET, SACRAMENTO, CALIFORNIA 95814

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES ASSOCIATED WITH
CONSTRUCTION ACTIVITY (GENERAL PERMIT)

BACKGROUND

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with an NPDES permit. The 1987 amendments to the CWA added Section 402(p) which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that establish storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water to waters of the United States from construction projects that encompass five (5) or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. Regulations (Phase II Rule) that became final on December 8, 1999 expand the existing NPDES program to address storm water discharges from construction sites that disturb land equal to or greater than one (1) acre and less than five (5) acres (small construction activity). The regulations require that small construction activity, other than those regulated under an individual or Regional Water Quality Control Board General Permit, must be permitted no later than March 10, 2003.

While federal regulations allow two permitting options for storm water discharges (individual permits and General Permits), the SWRCB has elected to adopt only one statewide General Permit at this time that will apply to all storm water discharges associated with construction activity, except from those on Tribal Lands, in the Lake Tahoe Hydrologic Unit, and those performed by the California Department of Transportation (Caltrans). Construction on Tribal Lands is regulated by an USEPA permit, the Lahontan Regional Water Control Board adopted a separate NPDES permit for the Lake Tahoe Hydrologic Unit, and the SWRCB adopted a separate NPDES permit for Caltrans projects. This General Permit requires all dischargers where construction activity disturbs one acre or more, to:

1. Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off site into receiving waters.

2. Eliminate or reduce nonstorm water discharges to storm sewer systems and other waters of the nation.
3. Perform inspections of all BMPs.

This General Permit shall be implemented and enforced by the nine California Regional Water Quality Control Boards (RWQCBs).

The General Permit accompanying this fact sheet regulates storm water runoff from construction sites. Regulating many storm water discharges under one permit will greatly reduce the otherwise overwhelming administrative burden associated with permitting individual storm water discharges. Dischargers shall submit a Notice of Intent (NOI) to obtain coverage under this General Permit. It is expected that as the storm water program develops, the RWQCBs may issue General Permits or individual permits containing more specific permit provisions. When this occurs, those dischargers will no longer be regulated by this General Permit.

On August 19, 1999, the State Water Resources Control Board (SWRCB) reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ referred to as "General Permit"). The San Francisco BayKeeper, Santa Monica BayKeeper, San Diego BayKeeper, and Orange Coast Keeper filed a petition for writ of mandate challenging the General Permit in the Superior Court, County of Sacramento. The Court issued a judgment and writ of mandate on September 15, 2000. The Court directed the SWRCB to modify the provisions of the General Permit to require permittees to implement specific sampling and analytical procedures to determine whether Best Management Practices (BMPs) implemented on a construction site are: (1) preventing further impairment by sediment in storm waters discharged directly into waters listed as impaired for sediment or silt, and (2) preventing other pollutants, that are known or should be known by permittees to occur on construction sites and that are not visually detectable in storm water discharges, from causing or contributing to exceedances of water quality objectives. The monitoring provisions in the General Permit have been modified pursuant to the court order.

TYPES OF CONSTRUCTION ACTIVITY COVERED BY THIS GENERAL PERMIT

Construction activity subject to this General Permit includes clearing, grading, disturbances to the ground such as stockpiling, or excavation that results in soil disturbances of at least one acre of total land area. Construction activity that results in soil disturbances of less than one acre is subject to this General Permit if the construction activity is part of a larger common plan of development that encompasses one or more acres of soil disturbance or if there is significant water quality impairment resulting from the activity. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility, nor does it include emergency construction activities required to protect public health and safety. Dischargers should confirm with the local RWQCB whether or not a particular routine maintenance activity is subject to this General Permit.

A construction project which includes a dredge and/or fill discharge to any jurisdictional surface water (e.g., wetland, channel, pond, or marine water) will also need a CWA Section 404 permit

from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the RWQCB/SWRCB. Storm water discharges from dredge spoil placement which occurs outside of Corps jurisdiction (upland sites) and are part of construction activity which disturbs one or more acres of land are covered by this general permit. Proponents of construction projects which disturb one or more acres of land within the jurisdictional boundaries of a CWA Section 404 permit should contact the local RWQCB to determine the applicability of this permit to the project.

NOTIFICATION REQUIREMENTS

It is the responsibility of the landowner to obtain coverage under this General Permit prior to commencement of construction activities. To obtain coverage, the landowner must file an NOI with a vicinity map and the appropriate fee with the SWRCB. In addition, coverage under this permit shall not occur until the applicant develops an adequate SWPPP for the project. Section A of the General Permit outlines the required contents of a SWPPP. For proposed construction activity on easements or on nearby property by agreement or permission, the entity responsible for the construction activity shall file an NOI and filing fee and shall be responsible for development of the SWPPP, all of which must occur prior to commencement of construction activities.

A separate NOI shall be submitted to the SWRCB for each construction site. Owners of new construction shall file an NOI prior to the commencement of construction. Owners of an ongoing construction site that is covered under the previous General Construction Permit (WQ Order No.92-08-DWQ) (1) shall continue to implement their existing SWPPP and monitoring program and (2) shall implement any necessary revisions to their SWPPP in a timely manner but in no case later than 90-calendar days from adoption of this General Permit in accordance with Section A of this General Permit.

The NOI requirements of the General Permit are intended to establish a mechanism which can be used to clearly identify the responsible parties, locations, and scope of operations of dischargers covered by the General Permit and to document the discharger's knowledge of the requirements for a SWPPP.

The NOI must be sent to the following address:

State Water Resources Control Board
Division of Water Quality
Storm Water Permit Unit
P.O. Box 1977
Sacramento, CA 95812-1977

The total annual fee is the current base fee plus applicable surcharges.

When construction is complete or ownership has been transferred, dischargers shall file a Notice of Termination with the RWQCB certifying that all State and local requirements have been met in accordance with Special Provisions for Construction Activity, C.7, of the General Permit.

Dischargers who fail to obtain coverage under this General Permit for storm water discharges to surface waters will be in violation of the CWA and the California Water Code.

CONSTRUCTION ACTIVITY NOT COVERED BY THIS GENERAL PERMIT

This General Permit does not apply to storm water discharges from (1) those areas on Tribal Lands; (2) the Lake Tahoe Hydrologic Unit; (3) construction under one acre, unless part of a larger common plan of development or sale; (4) projects covered by an individual NPDES Permit for storm water discharges associated with construction activity; and (5) landfill construction that is subject to the general industrial permit.

Storm water discharges in the Lake Tahoe Hydrologic Unit are regulated by a separate permit(s) adopted by the California Regional Water Quality Control Board, Lahontan Region (LRWQCB). USEPA regulates storm water discharges on Tribal Lands. Permit applications for storm water discharges that will be conducted in the Lake Tahoe Hydrologic Unit must be submitted directly to the LRWQCB.

DESCRIPTION OF GENERAL PERMIT CONDITIONS

The following is a brief description of the major provisions of the General Permit and the basis for the General Permit.

Prohibitions

This General Permit authorizes the discharge of storm water to surface waters from construction activities that result in the disturbance of one or more acres of land. It prohibits the discharge of materials other than storm water and authorized non-storm water discharges and all discharges which contain a hazardous substance in excess of reportable quantities established at 40 Code of Federal Regulations (CFR) 117.3 or 40 CFR 302.4 unless a separate NPDES Permit has been issued to regulate those discharges. In addition, this General Permit contains provisions that uphold discharge prohibitions contained in water quality control plans, as implemented through the nine RWQCBs.

Effluent Limitations

Permits for storm water discharges associated with construction activity shall meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT) to reduce pollutants and any more stringent controls necessary to meet water quality standards.

It is not feasible at this time for the SWRCB to establish numeric effluent limitations. The reasons why it is not feasible to establish numeric effluent limitations are discussed in detail in SWRCB Order Nos. WQ 91-03 and WQ 91-04. Therefore, the effluent limitations contained in this General Permit are narrative and include the requirement to implement appropriate BMPs.

The BMPs shall primarily emphasize source controls such as erosion control and pollution prevention methods. The discharger shall also install structural controls, as necessary, such as sediment control which will constitute BAT and BCT and will achieve compliance with water quality standards. The narrative effluent limitations constitute compliance with the requirements of the CWA.

Elimination or reduction of nonstorm water discharges is a major goal of this General Permit. Nonstorm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Nonstorm water discharges may contribute a significant pollutant load to receiving waters. Measures to control spills, leakage, and dumping and to prevent illicit connections during construction shall be addressed through structural as well as non-structural BMPs.

This General Permit prohibits the discharge of materials other than storm water and authorized nonstorm water discharges. It is recognized that certain nonstorm water discharges may be necessary for the completion of construction projects. Such discharges include, but are not limited to irrigation of vegetative erosion control measures, pipe flushing and testing, street cleaning, and dewatering. Such discharges are allowed by this General Permit provided they are not relied upon to clean up failed or inadequate construction or post-construction BMPs designed to keep materials onsite. These authorized nonstorm water discharges shall (1) be infeasible to eliminate, (2) comply with BMPs as described in the SWPPP, and (3) not cause or contribute to a violation of water quality standards. Additionally, these discharges may be required to be permitted by the local RWQCB (e.g., some RWQCBs have adopted General Permits for dewatering discharges). This General Permit is performance-based to the extent that it prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance; but it also allows the owner/developer to determine the most economical, effective, and possibly innovative BMPs.

The requirements of this General Permit are intended to be implemented on a year-round basis, not just during the part of the year when there is a high probability of a precipitation event which results in storm water runoff. The permit should be implemented at the appropriate level and in a proactive manner during all seasons while construction is ongoing.

Weather and storm predictions or weather information concerning the 10-year, 6-hour storm event and mean annual rainfall can be obtained by calling the Western Regional Climate Center at 775-674-7010 or via the internet at www.wrcc.dri.edu/precip.html and/or www.wrcc.dri.edu/pcpnfreq.html.

Receiving Water Limitations Language

The receiving water limitations language is fundamentally different from the language adopted in the SWRCB General Industrial Activities Storm Water Permit on April 17, 1997. Construction related activities which cause or contribute to an exceedance of water quality standards must be corrected immediately and cannot wait for the RWQCB to approve a plan of action to correct. The dynamic nature of construction activity allows the discharger the ability to more quickly identify and correct the source of the exceedances. Therefore, the owner is

required to take immediate corrective action and to provide a report to the appropriate RWQCB within

14-calendar days of the violation describing the corrective action.

Storm Water Pollution Prevention Plan (SWPPP)

This General Permit requires development and implementation of a SWPPP. This document emphasizes the use of appropriately selected, correctly installed and maintained pollution reduction BMPs. This approach provides the flexibility necessary to establish BMPs which can effectively address source control of pollutants during changing construction activities.

All dischargers shall prepare and implement a SWPPP prior to disturbing a site. The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. Nonstorm water BMPs must be implemented year round. The SWPPP shall remain on the site while the site is under construction, commencing with the initial mobilization and ending with the termination of coverage under the permit.

The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in storm water as well as nonstorm water discharges. The SWPPP shall include BMPs which address source control and, if necessary, shall also include BMPs which address pollutant control.

Required elements of a SWPPP include: (1) site description addressing the elements and characteristics specific to the site, (2) descriptions of BMPs for erosion and sediment controls, (3) BMPs for construction waste handling and disposal, (4) implementation of approved local plans, (5) proposed post-construction controls, including description of local post-construction erosion and sediment control requirements, and (6) nonstorm water management.

To ensure that the preparation, implementation, and oversight of the SWPPP is sufficient for effective pollution prevention, individuals responsible for creating, revising, overseeing, and implementing the SWPPP should participate in applicable training programs and document such training in the SWPPP.

SWPPPs are reports that are available to the public under Section 308(b) of the CWA and will be made available by the RWQCB upon request.

Monitoring Program

Another major feature of the General Permit is the development and implementation of a monitoring program. All dischargers are required to conduct inspections of the construction site prior to anticipated storm events and after actual storm events. During extended storm events, inspections must be made during each 24-hour period. The goals of these inspections are (1) to identify areas contributing to a storm water discharge; (2) to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Permit; and (3) whether additional control practices or corrective maintenance activities are needed. Equipment, materials, and

workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

Each discharger shall certify annually that the construction activities are in compliance with the requirements of this General Permit. Dischargers who cannot certify annual compliance shall notify the appropriate RWQCB. A well-developed monitoring program will provide a good method for checking the effectiveness of the SWPPP.

Retention of Records

The discharger is required to retain records of all monitoring information, copies of all reports required by this General Permit, and records of all data used to complete the NOI for all construction activities to be covered by the General Permit for a period of at least three years from the date generated. This period may be extended by request of the SWRCB and/or RWQCB. With the exception of reporting noncompliance to the appropriate RWQCB, dischargers are not required to submit the records, except upon specific request by the RWQCB.

FACT SHEET
FOR
WATER QUALITY ORDER 99-08-DWQ

STATE WATER RESOURCES CONTROL BOARD (SWRCB)
1001 I STREET, SACRAMENTO, CALIFORNIA 95814

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES ASSOCIATED WITH
CONSTRUCTION ACTIVITY (GENERAL PERMIT): Sampling and Analysis

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1.0 Introduction

This document is an amendment to the Fact Sheet to the State Water Resources Control Board's (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated With Construction Activity (CGP). This Permit was modified in 2001 by Resolution No. 2001-046, *"Modification of Water Quality Order 99-08-DWQ State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated With Construction Activity (CGP)"*. The modifications to the CGP require that a sampling and analysis strategy and sampling schedule for certain discharges from construction activity be developed and kept with the project's Storm Water Pollution Prevention Plan (SWPPP). The sampling and analysis requirements are found in Section B, paragraphs 7 and 8, of the CGP. Paragraph 7 concerns monitoring for sedimentation/siltation or turbidity and Paragraph 8 concerns monitoring for pollutants that are not visually detectable in storm water. Where required, a sampling and analysis strategy and sampling schedule must be developed regardless of the time of the year that construction occurs.

This document only addresses the modifications and is intended to facilitate the proper implementation of the sampling and analysis requirements. It provides information on when sampling and analysis is required, how to perform sampling and analysis, what conclusions may be drawn from the sampling and analysis results, and it explains the rationale for the required sampling.

SWRCB staff developed this document with consideration of comments from interested persons, including the California Stormwater Quality Association, the Building Industry Legal Defense Foundation, the California Building Industry Association, the San Francisco BayKeeper, the Santa Monica BayKeeper, the San Diego BayKeeper, and the Orange County CoastKeeper. It is based on the CGP, two orders issued by the Sacramento Superior Court in response to a challenge to the CGP, Clean Water Act provisions, regulations, guidance documents and permits issued by the federal Environmental Protection Agency, and other documents submitted by interested persons. A full record has been compiled and is available for inspection or copying upon request. A draft guidance document was circulated for public comment and a hearing was held prior to issuance of this final guidance document.

Although sampling and analysis will be required at many construction sites, it will not be required at all construction sites. It is the responsibility of dischargers to evaluate the construction project and, where required, to develop a site-specific sampling and analysis strategy in compliance with the CGP requirements. For further guidance please contact your local Regional Water Quality Control Board (RWQCB).

The sampling and analysis requirements supplement, but do not replace, the visual monitoring program required by Section B of the CGP. All construction projects must continue the visual monitoring program including inspections before predicted rain events, during extended rain events, and following rain events that produce runoff.

This document provides guidance on complying with the sampling and analysis requirements of the CGP. It does not in any way change these requirements or guarantee compliance with the CGP. The permit has many other requirements such as development of a SWPPP,

implementation of Best Management Practices (BMP) programs, and visual monitoring that are not addressed in this document.

1.1 Organization

Section 1: general information and background on the sampling and requirements.

Section 2: non-visible pollutant sampling and analysis.

Section 3: sediment, silt and turbidity sampling and analysis.

Section 4: sampling and analysis procedures.

Section 5: definitions.

Section 6: contact list and additional sources of information.

Section 7: general explanation of and rationale for the sampling and analysis requirements; citations to other documents that form the basis for the SWRCB's conclusions.

1.2 Background

The SWRCB adopted the CGP on August 19, 1999. The CGP is an NPDES permit that implements section 402(p)(2)(B) of the federal Clean Water Act. The San Francisco BayKeeper, Santa Monica BayKeeper, San Diego BayKeeper, and Orange County CoastKeeper filed a petition for writ of mandate challenging numerous aspects of the CGP in the Superior Court, County of Sacramento.

On September 15, 2000, the Court issued a judgment and writ of mandate that upheld most provisions of the CGP, but directed the SWRCB to modify the provisions of the CGP to require permittees to implement specific sampling and analytical procedures to determine whether BMPs implemented on a construction site are:

(1) preventing further impairment by sediment in storm waters discharged directly into waters listed as impaired (Clean Water Act Section 303(d) List [303(d) List]) for sediment, silt, or turbidity; and

(2) preventing other pollutants that are known or should be known by permittees to occur on construction sites and that can not be visually observed or detected in storm water discharges, from causing or contributing to exceedances of water quality objectives.

The monitoring, sampling and analysis provisions in the CGP were modified pursuant to the court order and issued as Resolution No. 2001-046, adopted by the SWRCB on April 26, 2001.

On December 27, 2001, the Court issued an Order Enforcing Writ of Mandate. In that order, the Court acknowledged that the permit had been modified, but required further actions by the SWRCB. Issuance of this fact sheet amendment is intended to respond to the Court's further instructions. In general, the Court expressed concern that certain aspects of the modifications might be ambiguous and might result in misinterpretation by dischargers. This amendment is

intended to avoid such potential ambiguities and misinterpretations and to help explain the requirements and provide suggestions for compliance.

1.2.1 Water Quality Standards or Objectives

The Receiving Water Limitations in the CGP require the SWPPP be designed and implemented so that storm water discharges and authorized non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standard. (CGP, Receiving Water Limitation B.2.) The modifications to the monitoring program require sampling and analysis procedures to help determine whether BMPs installed and maintained in accordance with the SWPPP are preventing pollutants in discharges from the construction site from causing or contributing to exceedance of water quality standards. In making these determinations, it is necessary to understand what are the applicable water quality standards.

Water quality standards consist of the designation of beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. (40 CFR §131.3(i)) When adopted by the SWRCB or a RWQCB, the criteria are termed "water quality objectives." (Water Code §13241; the terms are used interchangeably here.) If storm water runoff from construction sites contains pollutants, there is a risk that those pollutants could enter surface waters and cause or contribute to exceedance of water quality standards. For that reason, dischargers should be aware of the applicable water quality standards in their receiving waters. (The best method to ensure compliance with receiving water limitations is to implement BMPs that prevent pollutants from contact with storm water or from leaving the construction site in runoff).

In California, water quality standards are published in the Basin Plans adopted by each RWQCB, the California Toxics Rule (CTR), the National Toxics Rule (NTR), and the Ocean Plan. One way to determine the applicable standards for the receiving water for your runoff is to contact staff from the appropriate RWQCB. (See the contact list in Section 6 of this guidance.)

The SWRCB intends in the future to augment its internet site to further facilitate access to water quality standards. In the interim, dischargers can determine the applicable water quality standards by contacting RWQCB staff or from one of the following sources. The actual plans that contain the water quality standards can be viewed at the site of the appropriate RWQCB for Basin Plans (<http://www.waterboards.ca.gov/regions.html>), the SWRCB site for statewide plans (<http://www.waterboards.ca.gov/plnspols/index.html>), or the US Environmental Protection Agency (USEPA) regulations for the NTR and CTR (40 CFR Title 131). Basin Plans and statewide plans are also available by mail from the appropriate RWQCB or the SWRCB. The USEPA regulations are available at <http://www.epa.gov/>. Additional information concerning Water Quality Standards can be accessed through http://www.waterboards.ca.gov/stormwtr/gen_const.html

1.2.2 Non-Visible Pollutant Sampling

The monitoring requirements in the CGP require sampling and analysis for pollutants that are not visually detectable in storm water discharges, which are or should be known to occur on the construction site, and which could cause or contribute to an exceedance of water quality objectives. As is explained below, the situations where non-visible pollutants may occur in runoff from a construction site are limited. Where such non-visible pollutants are known or

should be known to be present and have the potential to contact runoff and to contribute to an exceedance of a water quality objective, sampling and analysis is required.

A variety of materials are used in construction or are present on construction sites. Examples of such materials include soil stabilizers, paint, and fluids from vehicles. Any of these materials can end up in the storm water runoff and contain pollutants that pose a threat to water quality. Some of these potential pollutants will leave a visible trace. For example, sediment turns water brown and oil and grease leave a sheen. Other pollutants will discolor the runoff or leave a residue or film. For pollutants that are visible in runoff, the CGP requires the discharger to perform visual monitoring of the site and does not require sampling and analysis. The sampling and analysis requirements only apply to pollutants that do not leave a visible trace or are not associated with a visible tracer. Examples of such potential non-visible pollutants include increased pH, pesticides, and nutrients such as nitrogen or phosphorus.

The presence or use of a material on the construction site does not always mean that dischargers must sample for it in runoff. The CGP requires sampling and analysis when non-visible pollutants could "cause or contribute to an exceedance of water quality objectives in the receiving water." The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and storm water runoff. Materials that are not exposed do not have the potential to enter storm water runoff, and therefore do not need to be sampled for in runoff. Preventing contact between storm water and construction materials is one of the most important BMPs at any construction site. Manage any potential pollutants on the site in such a way that the exposure of the pollutant to rainfall or storm water is minimized or eliminated.

Elimination of exposure of pollutants at construction sites is not always possible. Some materials, such as soil amendments, are designed to be used in a manner that will result in exposure to storm water. In these cases, it is important to make sure that these materials are applied according to the manufacturer's instructions at a time when they are unlikely to be washed away. Other materials can be exposed when storage, waste disposal or application are not done in a manner protective of water quality or through accidental spillage. For these situations, sampling is required unless there is capture and containment of all storm water that has been exposed to pollutants. In cases where construction materials may be exposed to storm water but the storm water is contained, and is not allowed to run off the site, then sampling only needs to occur when inspections show the containment failed or is breached and there is potential for exposure or discharge.

Many common good housekeeping BMPs already limit exposure to most materials. Improving these practices to prevent exposure is a better approach to preventing pollution of runoff and will limit the amount of sampling and analysis. Improved BMPs may be less costly than an ongoing sampling and analysis program.

The first step in managing potential pollutants at a construction site is the implementation of well thought out BMP programs that are designed to minimize the mobilization of pollutants such as sediment and to minimize the exposure of storm water to pollutants. The next important step is an aggressive program of inspections both on a regular basis and before and after storms. The inspection program must also be accompanied by an equally aggressive BMP maintenance

program. The receiving water is protected when appropriate BMPs are implemented, inspected and maintained. The role of sampling is to support the visual inspection of the site when necessary.

1.2.3 Sediment-Impaired Water Bodies

Certain lakes, streams, rivers, creeks and other bodies of water in California have been determined by the SWRCB to be impaired by one or more pollutants. (This listing is required by Clean Water Act section 303(d).) One of the pollutants that can trigger a listing is sediment, termed variously as sedimentation, siltation, sediment, or turbidity. The water bodies listed for sediment in California are included in Attachment 3 to the CGP. Additional discharges of sediment to a sediment-impaired water body could contribute to the exceedance of a water quality standard for that pollutant. Following listing of impaired waters, RWQCBs adopt total maximum daily loads (TMDLs) that may include waste load allocations for the impairing pollutant. Effluent limitations in NPDES permits must be consistent with the assumptions and requirements of waste load allocations (40 CFR section 122.44(d)(1)(vii)(B)), and adoption of TMDLs could result in specific requirements in the CGP or an individual or watershed-wide construction permit. Pending completion of TMDLs for sediment-impaired waters, it is necessary to ensure that sediment discharges from construction sites do not cause or contribute to exceedances of water quality. To that end, the modifications require sampling and analysis of discharges from construction activity that directly enters a water body listed in Attachment 3 to the CGP as impaired for sediment. This requirement is generally only applicable to a handful of construction projects each year.

To obtain the latest list of 303(d) water bodies, visit the SWRCB's Web site at <http://www.waterboards.ca.gov/>.

1.3 Purpose of Sampling and Analysis

The primary method of determining compliance with the CGP is visual inspections. The permit requires regular inspections as well as pre-storm and post-storm inspections to determine if there are areas where storm water can be or has been exposed to pollutants. It is possible to see if there is erosion and movement of soil, or if construction materials, chemicals and waste are exposed. This is the best way to determine if the site is in compliance. In some cases, verification of this compliance through sampling and analysis is appropriate. The purpose of the sampling and analysis requirements is to support the visual observation program and to provide information that can be used to help determine whether the BMPs employed on a construction site are effective in preventing construction site pollutants from causing or contributing to exceedances of water quality objectives in the receiving waters. The modifications to the CGP contain two categories of sampling and analysis requirements, which are illustrated in Figures 1-1 and 1.2.1-4:

Monitoring for non-visible pollutants at any site where the relevant triggering conditions occur. This monitoring is required at any site where there is exposure and where a discharge can cause or contribute to exceedance of a water quality objective, not just those that discharge to water bodies that are listed for a particular pollutant; and

Monitoring for sediment in storm water discharged directly to water bodies listed as impaired for sediment/siltation, sediment, or turbidity on the SWRCB's 303(d) list of water bodies.

The sampling and analysis results are not conclusive proof of compliance or non compliance with the permit. Specifically, Receiving Water Limitations in the CGP provide that the SWPPP must be designed and implemented so that storm water discharges shall not cause or contribute to exceedance of any applicable water quality standards. These provisions also require implementation of corrective measures, and revision of the SWPPP and monitoring requirements if storm water discharges do cause or contribute to an exceedance of an applicable water quality standard. USEPA has pointed out the difficulties and limitations of using sampling in storm water permits as a measure of compliance. (57 Fed. Reg. 11394, 11402) While sampling and analysis, as required by the CGP, may be a useful tool in pointing to areas of concern, it is of limited use in the storm water context and must be used as a diagnostic tool rather than as conclusive evidence of compliance or non-compliance with the CGP.

**Determine if You Must Perform Sampling and Analysis for
Sediment, Silt, or Turbidity**

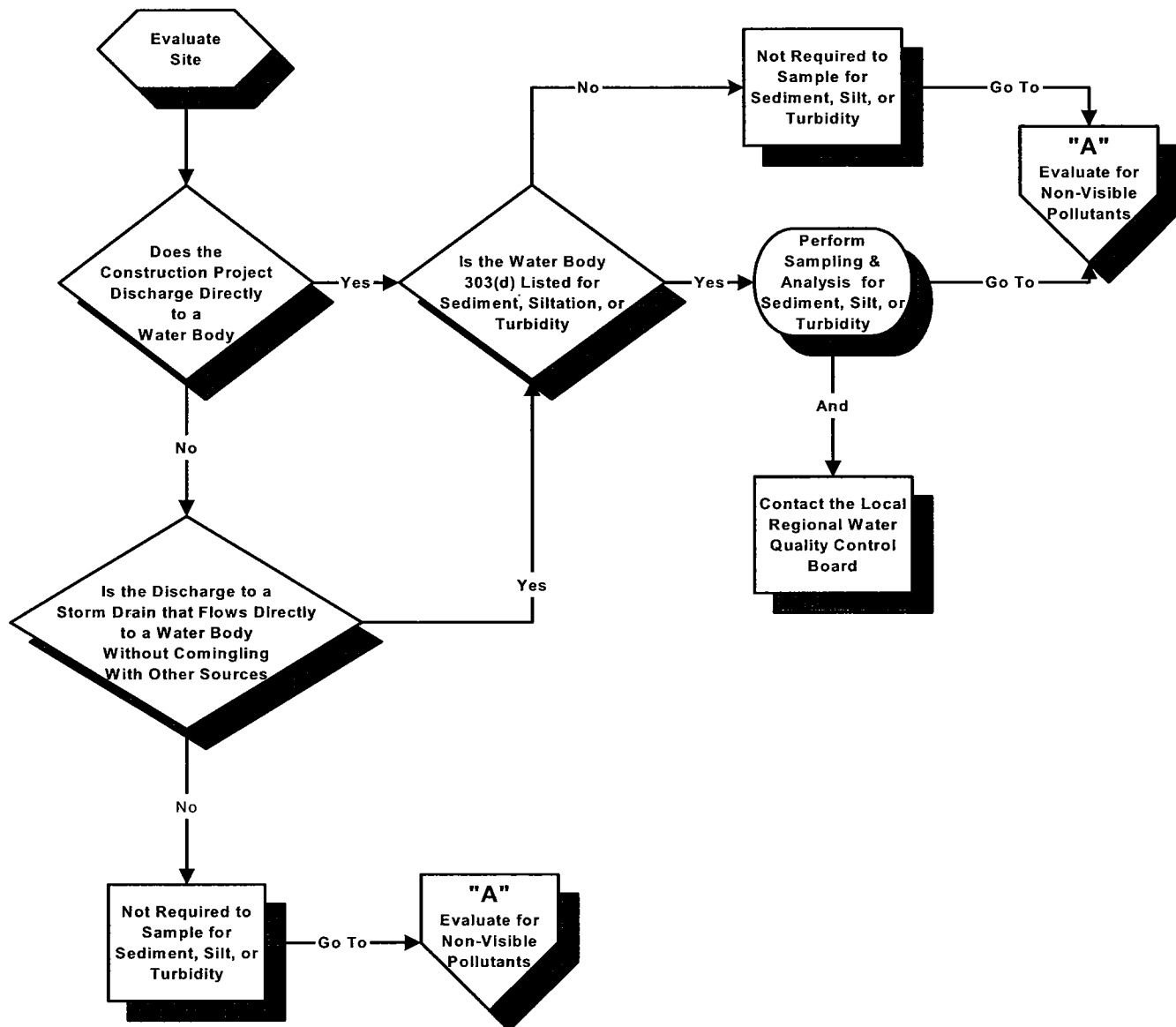


Figure 1.1

**Evaluate Site for Non-Visible Pollutants
and Determine if You Must Perform
Sampling & Analysis for Non-Visible Pollutants**

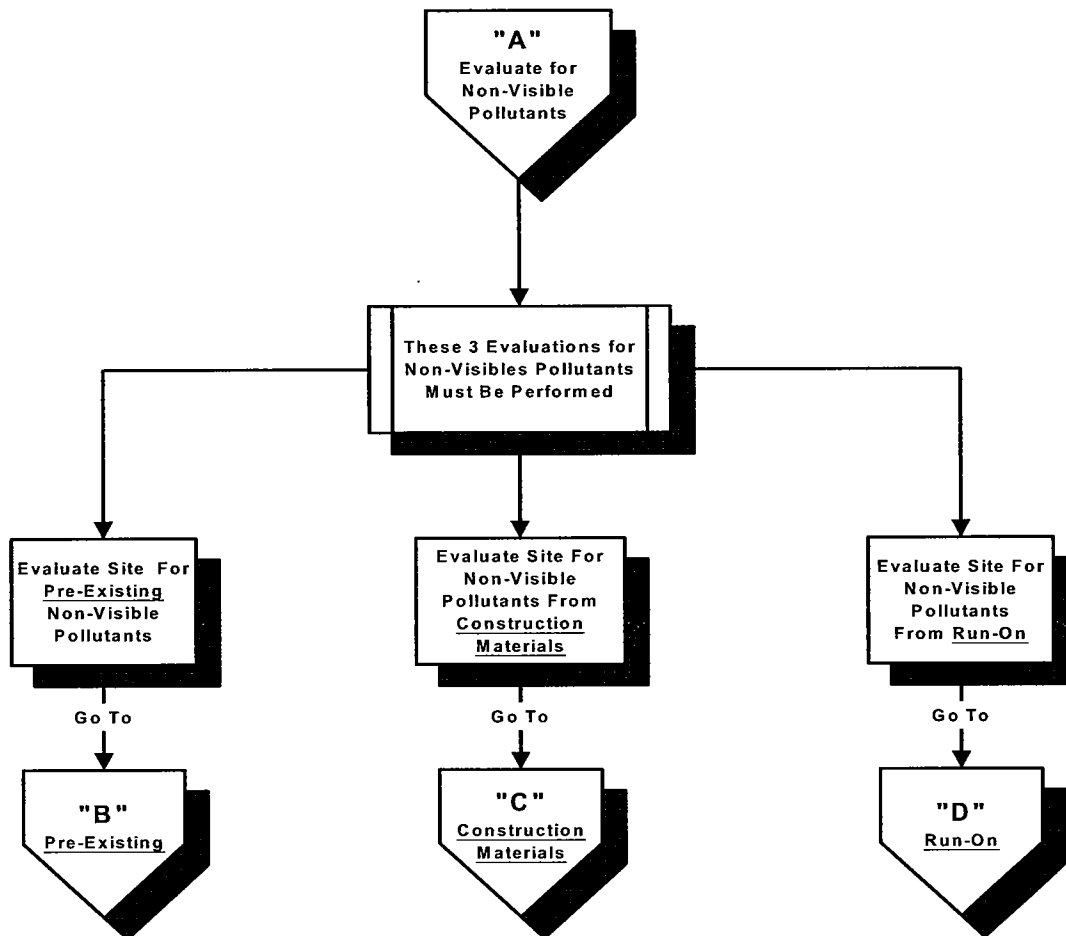


Figure 1.2

**Determine If You Must Perform Sampling and Analysis (S&A) for
Pre-Existing Non-Visible Pollutants**

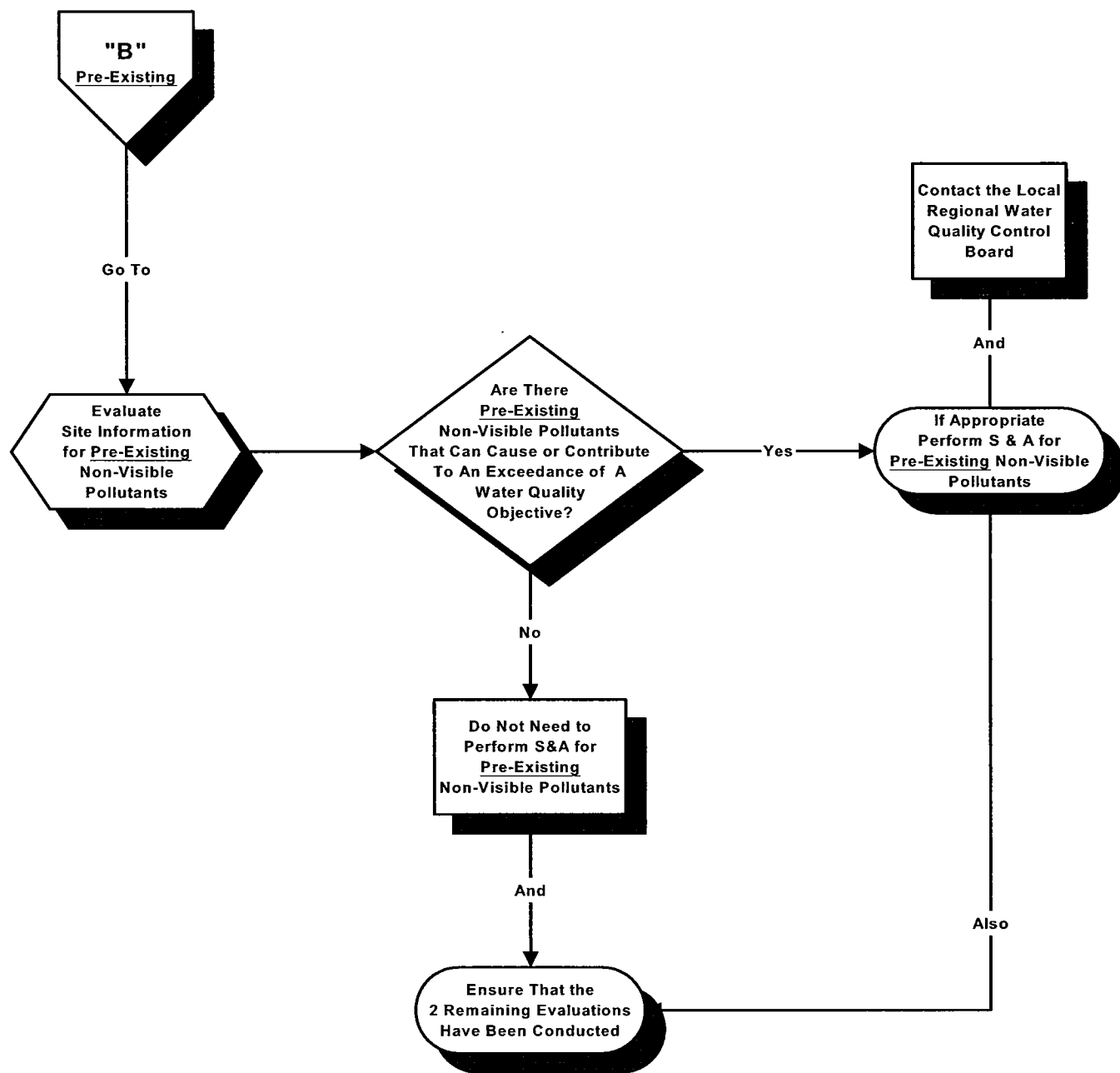


Figure 1.2.1

**Determine If You Must Perform Sampling and Analysis (S&A)
for Non-Visible Pollutants
From Construction Material**

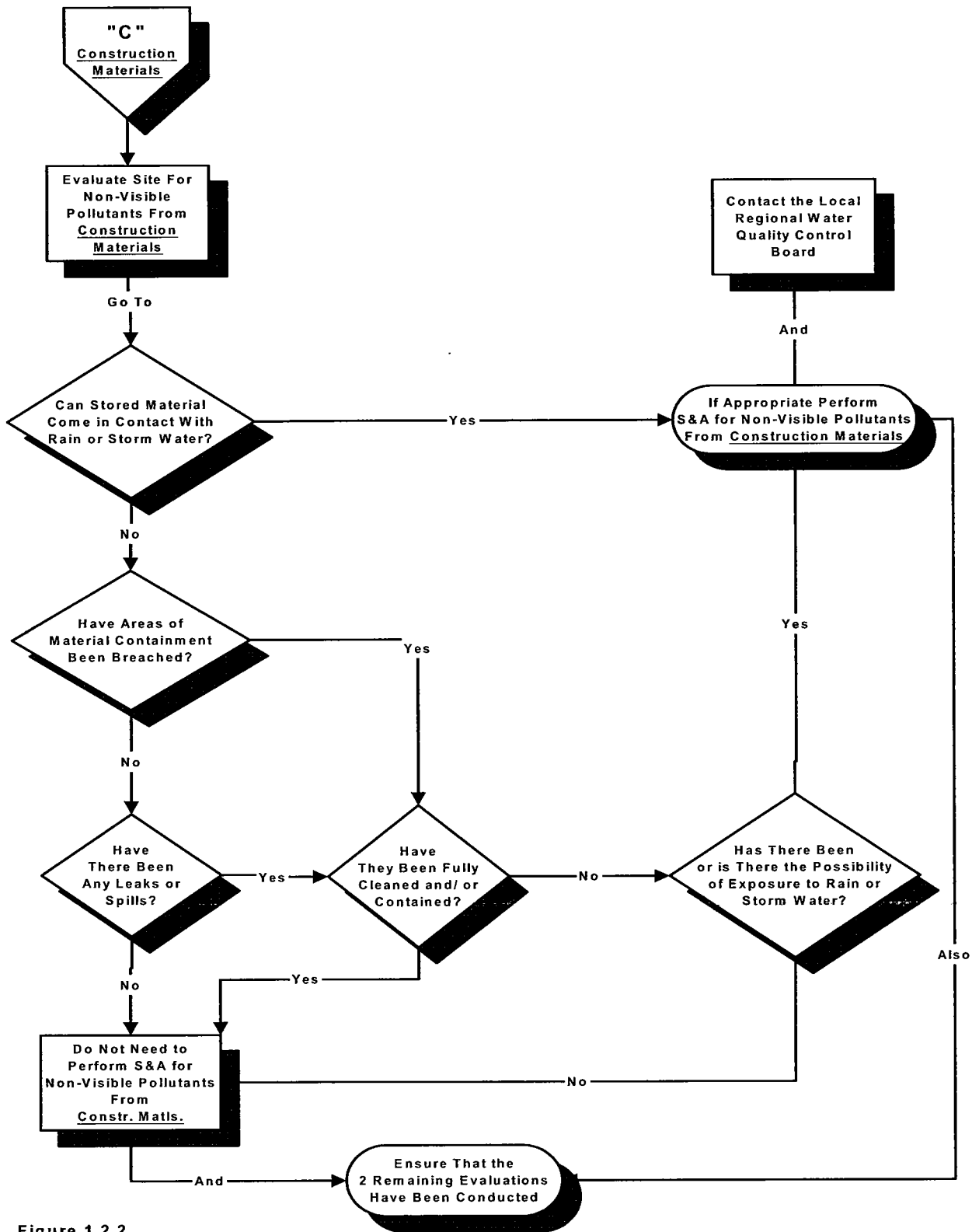


Figure 1.2.2

**Determine If You Must Perform Sampling and Analysis (S&A)
for Non-Visible Pollutants
From Run-On**

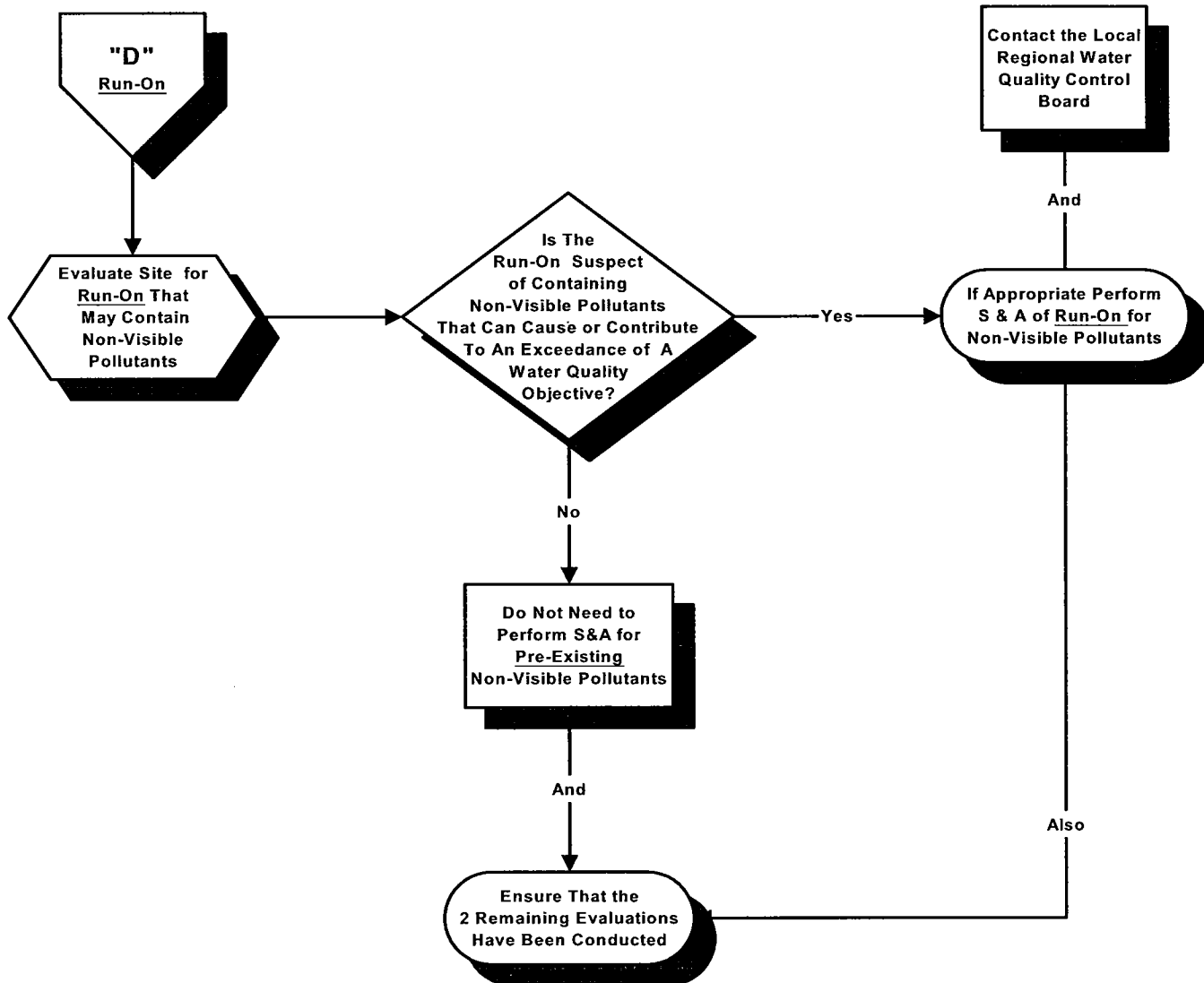


Figure 1.2.3

2.0 Sampling Program for Pollutants Not Visually Detectable in Storm Water

The CGP requires sampling and analysis for pollutants not visually detectable in runoff, but which could cause or contribute to an exceedance of water quality objectives in the receiving water. Sample for a constituent if there is reason to expect that it may be in the discharge, regardless of whether or not it is causing or contributing to an exceedance of a water quality objective. First attempt to eliminate the exposure of construction materials to prevent pollution of storm water and thus to limit the requirement for sampling and analysis. Many construction materials, including soil amendments, fertilizers, pesticides, and even things like fencing and wood products, are intended for use outdoors. For such materials, minimize pollutant discharge through implementation of appropriate BMPs. If exposure to these products can contribute pollutants to the runoff at levels that could cause or contribute to exceedance of a water quality objective, then sampling is still required, even if they are used correctly.

2.1 What the Permit Says about Sampling

The CGP requires that a sampling and analysis program be developed and conducted for pollutants which:

- Are not visually detectable in storm water discharges,
- Are known or should be known to occur on the construction site, and
- Could cause or contribute to an exceedance of water quality objectives in the receiving water.

Include all pollutants identified in this way in this sampling and analysis strategy and identify them in the SWPPP (as required by Sections A. 5. b. and A. 5. c. of the CGP). The CGP states that the SWPPP must identify a strategy for conducting the sampling and analysis, including the frequency and location(s) at which sampling will be conducted.

Sample for pollutants that would not be visible in runoff if:

- Visual inspections (required before, during and after storm events) indicate that there has been a breach, malfunction, leakage or spill from a BMP that could result in the discharge of pollutants in storm water and the pollutants would not be visually detectable; or
- Storm water comes into contact with soil amendments, other exposed materials, or other on site sources of pollution.

2.2 Deciding When to Sample

Conduct proper inspections throughout the duration of the project to make sure that appropriately selected BMPs have been implemented, are being maintained, and are effective. Sample if non-visible pollutants that are known or should be known to occur on the construction site “could cause or contribute to an exceedance of water quality objectives in the receiving water.” As discussed in this document, there are numerous receiving water standards found in different documents, including narrative water quality objectives in basin plans. For that reason,

and because of the difficulties associated with linking a discharge from a construction site to exceedance of water quality standards in the receiving waters, conduct sampling and analysis whenever the above conditions are met.

If a determination is made that sampling is needed, collect storm water runoff samples regardless of the time of year, status of the construction site, or day of the week. Collect samples during the first two hours of runoff (during daylight hours). Storm water inspections and sample collections are required even during non-working days (including weekends and holidays).

2.3 Deciding What Constituents to Sample for: What are Pollutants Which are "Known or Should be Known " to Occur on a Construction Site?

Pollutants can be considered to be known or should be known to occur on the construction site if they are currently in use or are present as a result of previous land uses. This includes materials that:

- are being used in the construction activities
- are stored on the construction site
- were spilled during construction operations and not cleaned up
- were stored (or used) in a manner that presented the potential for a release of the materials during past land use activities
- were spilled during previous land use activities and not cleaned up
- were applied to the soil as part of past land use activities.

Construction material inventories and the project SWPPP should provide adequate information on materials currently in use or proposed for use on the construction site.

Develop a list of potential pollutants based on a review of potential sources identified in your SWPPP (required by CGP sections A.5.b. and A.5.c.), which will include construction related materials, soil amendments, soil treatments, and historic contamination. Review existing environmental and real estate documentation to determine the potential for pollutants to be present on the construction site as a result of past land use activities. Good sources of information on previously existing pollution and past land uses include Environmental Assessments, Initial Studies, Environmental Impact Reports or Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act or the California Environmental Quality Act, and Phase 1 Assessments prepared for property transfers. In some instances, the results of soil chemical analyses may be available and can provide additional information on potential contamination.

Identify from this list those pollutants that would not be visible in storm water discharges. These are the constituents that you will likely have to sample for in runoff if the materials are

exposed to storm water. Consult with your analytical laboratory or water quality chemist to determine if there are field tests or indicator parameters that can be used.

2.4 Deciding Where to Sample

Sample at all discharge locations that drain the areas from which the pollutants may have entered the runoff and at locations that have not come in contact with the pollutants (reference sampling). This allows a comparison of reference samples with the sample(s) collected from storm water suspected of containing construction-related pollutants. The collection of this sample is important in the interpretation of the potentially contaminated sample because it provides information on the characteristics of the storm water without the exposure. For example, if storm water were to come in contact with hydrated lime products, the indicator parameter for pollution would be an elevated pH. The storm water could also be polluted with other materials or minerals, but the elevated pH will provide information necessary for the discharger to make further determinations as to the cause. In this case, a sample of storm water from the same storm event that did *not* come in contact with the hydrated lime would provide an understanding of what the pH of the uncontaminated storm water was in relation to the polluted storm water.

A more accurate background sample would have also contacted the soil and vegetation of the area, further isolating the lime as the source of the elevated pH. This gives the discharger the necessary information to take immediate steps to detain the polluted storm water or to

minimize or eliminate the exposure. Describe the sampling procedure, location and rationale for obtaining the reference sample of storm water in the SWPPP.

Identify sampling locations that provide information on both the runoff quality that is affected by material storage, historic contamination or other exposed potential pollutants, and the background runoff quality (i.e., reference sample). Material storage may be confined to a small area of the project while historic contamination or exposed materials, such as soil amendments, may be widespread throughout the construction site. For this reason, the sampling locations identified for these two types of potential pollutants may be different.

- Collect samples at locations identified in your SWPPP and in areas identified by visual observations/inspections where there has been a BMP failure or breach and which can be safely accessed.
- Collect samples from a location that is not affected by material storage activities or by runoff as a background or reference location.
- For a widespread potential pollutant, select sampling locations at the perimeter of your site, where storm water is unaffected by your activities and compare this to areas that are affected by your activities on the site. Describe the sampling procedure, the location, and the rationale for selecting these locations in the SWPPP.

If the “reference sample” is taken from on-site and it turns out to be carrying a high level of pollutants this should trigger an evaluation of this drainage area. Are there previously

undetected sources of pollutants? It may turn out that additional BMPs may be necessary on this portion of the site or that the discharge must be managed or contained.

If the "reference sample" is taken from off site and it turns out to be carrying a high level of pollutants take a sample on site to determine if the same pollutants are on site and must be managed.

2.5 Types of Test Methods?

The CGP requires sampling of non-visible pollutants that "could cause or contribute to an exceedance of water quality objectives in the receiving waters". Unlike sediment, for which there are a limited number of applicable water quality objectives, the applicable water quality standards for "non-visible" pollutants will depend on the material and its chemical makeup. This guidance document contains information on what pollutants may occur on construction sites and which water quality standards may be associated with those pollutants. The best assurance of complying with the receiving water limitations is to prevent or reduce runoff of all polluting substances from construction sites through implementation of effective BMPs.

The sampling and analysis language recognizes that sampling and laboratory analysis, in and of itself, does not protect water quality. Rather, field identification and detection of the source of pollution, followed by timely action is ultimately what will protect the receiving waters. Because of the short-term nature of construction, and the use of different materials during the construction period, laboratory sampling will not generally provide the information needed in an adequate time frame. It is preferable to use field-sampling techniques that can provide immediate information and allow a timely solution.

For this reason, the sampling and analysis language for non-visible pollutants contemplates field sampling using indicator parameters. The correct indicator parameter can provide a quick and immediate indication of contamination of storm water to known materials stored or used on a construction site. Field test kits and devices have been commercially available for decades and widely used for water quality applications. As an example, test strips to evaluate for ammonia, phosphate, chlorine, copper, iron, nitrate, nitrite, and low and high range pH are readily commercially available. Manufacturers and distributors provide technical support as well as training to their customers.

2.6 Deciding How Often to Sample

Determine the frequency of sampling for non-visible pollutants based on the exposure of pollutant sources. Sample runoff when BMPs do not effectively prevent or reduce exposure of a non-visible pollutant source to storm water. Sample runoff when inspections identify a BMP failure, which exposed pollutants to storm water. If spills are thoroughly cleaned up and the contaminated material is isolated, eliminating exposure to storm water runoff, sampling is not required. For instances when the potential for previously existing pollution is identified, perform laboratory screening analysis during the first one or two storm events of the season to determine if the potential pollutant is running off the construction site. If construction activity will disturb or mobilize such potential pollutant sources, take samples to determine if the pollutants are being mobilized by the construction activity.

2.7 Identification of Pollutant Sources

Information about various construction pollutant sources can be viewed by following the instructions posted on the swrcb.ca.gov web site. In addition, various discharger groups have also produced information that may be useful for determining pollutants sources and sampling parameters for runoff from construction activity. These include a "Pollutant Testing Guidance Table" that lists construction materials, describes whether they would be visible in runoff, and lists pollutant indicators, which will be available on the swrcb.ca.gov/stormwtr/gen_const.html web site

2.8 Examples of When Sampling and Analysis for Non-Visible Pollutants Is Not Required

Sampling and analysis is not required under the following conditions. However, a contingency sampling strategy should be prepared in the event of an accidental discharge.

- Where construction takes place entirely during a period of time when there are no rainfall events. Timing construction to occur outside of the rainy season is the most effective BMP.
- Where a construction project is "self-contained", meaning that the project generates no runoff or any potential discharges containing pollutants, including no potential for tracking sediment off-site from vehicle tires, and no potential for discharging products of wind erosion.
- Where construction materials and compounds are kept or used so that they are not in contact with storm water (e.g., in water-tight containers, under a water-tight roof, inside a building, etc.).
- Where for specific pollutants, the BMPs implemented at the construction site fully contain the exposed pollutants (e.g., bermed concrete washout area).
- For building, landscaping and BMP materials that are in their final constructed or in-place form or are designed for exposure (e.g., fence materials, support structures and equipment that will remain exposed at the completion of the project, etc.).
- Where pollutants may have been spilled or released on site, but have been properly cleaned-up and storm water exposure has been eliminated prior to a storm event.
- For stockpiles of construction materials for which both cover and/or containment BMPs have been properly implemented to protect them from run-on and from contributing pollutants to storm water .

2.9 Examples of When Sampling and Analysis Is Required

Sampling and analysis is required when non-visible pollutants have the potential to contact storm water and run off the construction site into a storm drainage system or water body at levels that may cause or contribute to exceedance of water quality standards. Some examples of this situation are:

- Where construction materials and compounds are stored or applied such that they may come in contact with storm water runoff.
- For construction projects that utilize soil amendments or soil treatments that can come in contact with storm water runoff. (If you have independent test data available that demonstrates that the soil amendments cannot result in concentration levels in storm water discharges that will cause or contribute to exceedance of applicable water quality standards, sampling and analysis may not be required. Contact the appropriate RWQCB to determine acceptable concentration(s) of the material(s) in question.)
- When a leak or spill occurs that is not fully contained and cleaned prior to a storm event.
- When a leak or spill occurs, during a storm event, and it cannot immediately be isolated and/or cleaned-up, and the possibility of an off-site discharge exists.
- When, during regular inspections, it is discovered that cover and containment BMPs have been compromised and storm water comes in contact with materials resulting in runoff discharging into a storm drain system or water body.
- When material storage BMPs have been compromised, breached, or have failed.

2.10 Do I Sample Storm Water Flows Diverted Around My Project for Non-Visible Pollutants?

Dischargers may be faced with a situation where the disturbed area of their construction site is adjacent to a large area that historically has drained across their site. This happens most frequently in foothill situations where schools or commercial development is undertaken alongside an existing roadway, adjacent to a large undisturbed area. In such a situation, calculate the anticipated volume of the flow in order to size a diversion structure to divert the (usually) clean storm water around or through the site. (CGP section A.5.b.1.) It is unwise to allow a large volume of water to wash across a disturbed area. Not only would the run-on cause erosion and remove the soil from the project, but also the discharge would be turbid and violate the Permit requirements. To the extent that the discharger does allow run-on of polluted water to flow across the site, and contaminants in the run-on are not visible, the sampling and analysis requirements apply. Additionally, the CGP (section A. 5. b.) requires that the RWQCB be contacted in the above situation.

The requirement to divert run-on does not authorize the creation of a new point source of pollutants, however. If the run-on contains pollutants from pre-existing pollution in the watershed, the discharger is responsible to determine this before planning the diversion. Should a discharger divert contaminated water around the site and allow it to enter surface waters, this permit does not authorize such discharge and the discharger should be aware that a separate NPDES permit may be required. (See, *Committee to Save Mokelumne River v. East Bay Municipal Utility District* (9th Cir. 1993) 13 F.3d 305, 309.) If you are planning on diverting flows from entering your site and you suspect that they contain pollutants, contact your local RWQCB for advice.

2.11 Deciding How to Sample

- Only personnel trained in water quality sampling procedures should collect storm water samples.
- Determine sampling methods and locations in advance of the runoff event in order to provide sufficient time to gather the supplies and equipment necessary to sample and plan for safe access by the sampling personnel.
- General guidance for sampling procedures is provided in Section 4 of this document.

2.12 How to Use Your Sampling Data

2.12.1 How to Analyze Your Data

Initiate corrective action where non-visible pollutant sample test results indicate presence of pollutants in the construction site storm water runoff. This can be determined by comparing your construction site's storm water test results with the background sample. BMPs must be used to control offsite discharge of any pollutant (e.g., pesticides) that is not naturally occurring, regardless of background levels of that pollutant.

Where your site's storm water test concentrations for naturally occurring substances are considerably above (or, in the case of pH, considerably above or below) the background concentrations, or where other pollutants are found, evaluate the BMPs to determine the cause. Initiate corrective action by repairing, replacing or supplementing the BMPs on your site. Conduct additional sampling during the next runoff event after corrective actions are implemented to demonstrate and document that the problems have been corrected.

This permit does not contain benchmarks. However, method of data analysis for naturally occurring substances employs a similar concept: determining whether the results are "considerably above" the background levels. The term "considerably above" is based upon guidance contained in USEPA's Multi-Sector General Permit, which does use benchmarks. These benchmarks are not numeric storm water effluent limits, are not related or necessarily protective of any specific receiving water, and exceedances of these benchmarks are not automatically considered permit violations. When sample results exceed one or more of the benchmarks, the USEPA recommends dischargers reevaluate the effectiveness of their BMPs and develop, when appropriate, additional BMPs. The use of such benchmark values is a scientifically valid indicator of the presence of pollutants associated with construction activity in the runoff. Since the non-visual pollutants that may occur on construction sites may be similar in type and cause to those on industrial sites, it is valid to use USEPA's approach here. Where a parameter in a sample is being evaluated, and a benchmark is available, the benchmark may be used for comparison purposes. (USEPA does not require any sampling and analysis in its construction permits, and therefore does not have benchmarks for construction activities.)

2.12.2 Coordinating Visual Observations with Sampling Results

If visual inspection of storm water BMPs used to contain or otherwise manage (i.e., filter or treat) non-visible pollutants at a construction site indicates that a BMP has failed or been compromised, then field monitoring of any impacted storm water from the site for non-visible pollutants is required. Of course, immediately repair or replace any BMP that has been visually inspected and found breached or compromised. If feasible, contain the polluted discharge and prevent it from being discharged off site. After taking steps to correct the failed BMP, conduct field monitoring in the vicinity of the BMP to verify that pollutants are no longer in the storm water.

The intent of conducting field monitoring for non-visible pollutants is to obtain an immediate indication if storm water that is discharging from a site has been polluted. An immediate indication of a polluted discharge requires an immediate response in the form of backtracking from the point of discharge to find the source and take appropriate measures to prevent a recurrence of a polluted discharge.

2.12.3 What To Do If The Data Show a Potential Problem

If your data shows a problem, follow the reporting requirements as shown in the CGP Receiving Water Limitations. In addition, take the following steps as soon as possible:

- Identify the source
- Repair or replace any BMP that has failed
- Maintain any BMP that is not functioning properly due to lack of maintenance
- Evaluate whether additional or alternative BMPs should be implemented

If sampling and analysis during subsequent storm events shows that there is still a problem, then repeat the steps above until the analytical results of “upstream” and “downstream” samples are relatively comparable.

Where your site’s storm water results show test concentrations considerably above (or below) background concentrations, evaluate the BMPs to determine what is causing the difference. Possible solutions may include repairing the existing BMPs, evaluating alternative BMPs that could be implemented, and/or implementing additional BMPs (cover and/or containment) which further limit or eliminate contact between storm water and non-visible pollutant sources at your site. Where contact cannot be reduced or eliminated, retain storm water that has come in contact with the non-visible pollutant source on-site and do not allow it to discharge to the storm drainage system or to a water body. Contact your RWQCB to determine whether it is permissible to discharge the retained storm water. Conduct additional sampling during the next runoff event after corrective actions are implemented to demonstrate and document that the problems have been corrected.

2.13 Retention of Data

Keep results of field measurements and laboratory analyses with the SWPPP, which is required to be kept on the project site until the Notice of Termination (NOT) is filed and approved by the

appropriate RWQCB. Keep field training logs, Chain-Of-Custody (COC) forms and other documentation relating to sampling and analysis with the project's SWPPP. Records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated or after project completion.

3.0 Sampling Program for Sedimentation/Siltation

3.1 What the Permit Says About Sampling

Soils, sediments, and fine (suspended) particles that result from grading and earthwork activities and soil erosion from disturbed, un-stabilized land areas are potentially significant sources of storm water pollution at construction sites. The CGP requires construction sites to develop, implement and maintain an effective combination of erosion control and sediment control BMPs to prevent soils, sediments, debris and solids fine enough to remain suspended from leaving the construction site and moving into receiving waters at levels above preconstruction levels.

The CGP requires that a visual survey of the site be done before, during and after a storm. If the visual survey indicates either the potential for a discharge of sediment laden water or that sediment is being discharged, steps must be taken to repair or augment the BMPs to prevent the discharge as soon as possible. Discharge of sediment above predevelopment levels is not allowed.

The CGP requires sampling and analysis for sediment/silt or turbidity when the construction site runoff discharges directly into a water body that is impaired by sedimentation/siltation, sediment, or turbidity (that is, the water body is on the 303(d) list for one or more of these pollutants.) A key point is that the discharge of storm water runoff must directly enter the impaired water body or impaired segment of a water body. Construction site runoff that flows through a tributary or storm drainage system and is commingled with other sources of flow, is not considered a direct discharge even if the flow eventually enters an impaired water body. (See the definition of direct discharge in Section 5 for further details.)

The CGP requires that the SWPPP identify a strategy for conducting the sampling and analysis, including the frequency at which sampling will be conducted. The SWPPP must also describe:

- the location(s) of direct discharges from construction activities to a water body listed on the SWRCB's 303(d) list for sedimentation/siltation, sediment and/or turbidity;
- the designated sampling location(s) in the listed water body representing the prevailing conditions up-stream of the discharge; and
- the designated sampling location(s) in the listed water body representing the prevailing conditions down-stream of the discharge.
- the sampling design which describes the sampling devices used; the sample size; the number of samples to be taken at each location, the laboratory protocol employed; and, if applicable, the statistical test used to determine if the upstream/downstream samples differ to a statistically significant degree.

3.2 Deciding When to Sample

- Dischargers must perform sampling if the storm water runoff directly discharges from the construction site to a 303(d) listed water body.
- Dischargers must collect samples during the first two hours of discharge (runoff) from storm events which result in a direct discharge to any 303(d) listed water body. But samples need only be collected during daylight hours (sunrise to sunset).
- Dischargers must collect samples regardless of the time of year, status of the construction site, or day of the week. Samples should be taken during the first two hours of a storm event. Storm water inspections and sample collections are required even during non-working days (including weekends and holidays). Samples must be taken from the same storm event for comparison, concentrations are not comparable across storm events.
- Dischargers do not need to perform upstream/ downstream sample collection for more than four (4) rain events per month.

3.3 Deciding What Constituent(s) Require Sampling

- If the water body is listed as impaired for sedimentation or siltation, analyze samples for Settleable Solids (mL/L) and Total Suspended Solids (mg/L) according to USEPA 160.2 and USEPA 160.5, respectively. Samples may be analyzed for suspended sediment concentration (SSC) according to ASTM D3977-97 instead of or in addition to Total Suspended Solids and Settleable Solids.
- If the water body is listed as impaired for turbidity, analyze samples for turbidity per USEPA 180.1 or analyze in the field using a correctly calibrated turbidity meter.
- It is very important that consistent sampling and analysis methods are used for all sampling locations.

Table 3-1 shows general sample handling and laboratory requirements for sediment sampling.

Table 3-1
LABORATORY REQUIREMENTS¹ FOR STORM WATER MONITORING OF SEDIMENT, SILTATION AND/OR
TURBIDITY

Parameters	Analytical Method	Target Method Detection Limit	Minimum Sample Volume ²	Container	Preservative	Holding Time
Total Suspended Solids (TSS) ²	EPA 160.2	1 mg/L	100 mL	500 mL polypropylene	Store in ice or refrigerator at 4°C (39.2°F)	7 days
Settleable Solids (SS)	EPA 160.5	0.1 mL/L/hour	1 liter	1 liter mL polypropylene	Store in ice or refrigerator at 4°C (39.2°F)	48 hours
Suspended Sediment Concentration (SSC) ³	ASTM D 3977-97	Contact Laboratory	200 mL	Contact Laboratory	Store in ice or refrigerator at 4°C (39.2°F)	7 days
Turbidity	EPA 180.1	1 NTU	100 mL	500 mL polypropylene or glass	Store in ice or refrigerator at 4°C (39.2°F), Dark	48 hours

- ¹ The data in this table is a summary of recommended laboratory requirements. For specific USEPA regulatory requirements, consult the sampling and analysis requirements found in 40 CFR 136.
- ² Minimum sample volume recommended. Specific volume requirements will vary by laboratory; please check with your laboratory when setting up bottle orders.
- ³ Use either TSS or SSC, or both, for suspended solids analysis. Upstream and downstream samples should be analyzed by the same method.

3.4 Deciding Where to Sample

In-stream sampling is required, both upstream and downstream of the discharge. The CGP does not require that the effluent be sampled. However, effluent sampling is recommended. Take both upstream and downstream samples within the actual flow of the waterbody. Collect samples at the following locations:

- Sample the 303(d) listed water body upstream of the construction site discharge in a location representative of the sediment load present in the water body before it is impacted by discharge from the construction site.
- Sample the 303(d) listed water body at a point immediately downstream of the last point of discharge from the construction site.

Additionally, for the purpose of interpreting the results of the samples collected from the 303(d) listed water body, collect and analyze samples of the actual discharge from the construction site (effluent sample) prior to it being commingled in the receiving water. This sample can be used to verify whether the source of the sediment in-stream is emanating from the construction discharge. Remember that samples should only be collected from safely accessible locations.

In general, sample away from the bank in or near the main current. Avoid collecting samples directly from ponded, sluggish, or stagnant water. Be careful when collecting water upstream or downstream of confluences or point sources to minimize problems caused by backwater effects or poorly mixed flows. Note that samples collected directly downstream from a bridge can be contaminated from the bridge structure or runoff from the road surface.

Choose the upstream location in water that appears to represent the nature of the flow in the stream.

Downstream samples should represent the receiving water mixed with flow from the construction site. For instance if the flow from the site can be observed by either a color or a flow difference, collect the downstream sample from within the affected water.

3.5 What Are the Applicable Water Quality Standards

The CGP requires sampling of runoff from construction sites that discharge directly to 303(d) listed water bodies to demonstrate that discharges do not contribute to the impairment of the receiving water. Each of the listed waters is subject to water quality objectives in a RWQCB Basin Plan for sediments and solids or for turbidity. The applicable water quality objectives for each RWQCB are listed in Appendix A to this guidance document.

3.6 Deciding How to Sample

- Only personnel trained in water quality sampling procedures should collect storm water samples.

- Determine sampling methods and locations in advance of the runoff event in order to provide sufficient time to gather the supplies and equipment necessary to sample and plan for safe access by the sampling crew(s) and document them in the SWPPP.
- General guidance for sampling procedures is provided in Section 4 of this document.

3.7 How to Use Your Data

3.7.1 How to Analyze Your Data

While it is desirable for sediment concentrations from a site to be as low as possible, the amount that a site can contribute is determined by a TMDL analysis and in the absence of an implemented TMDL, the instream concentrations below the point of discharge cannot be significantly different from the upstream concentrations.

In order to allow for meaningful analysis of the data, it is necessary to establish a statistical framework for it. When sampling a body of water, it is unlikely that two samples, even taken next to each other, will have the same concentration of a pollutant. This is referred to as variability. Concentrations will vary from sample to sample, but the difference between them may not be meaningful. In order to obtain a statistically meaningful set of samples, it is necessary to determine how many samples will be necessary, the greater the variability between samples, the larger the number of samples (N) will be required. This may require that the water body be sampled before the start of construction to determine the variability. Collect sufficient numbers of samples (N) during each storm event monitored to represent the prevailing conditions of both locations (upstream and downstream). Depending upon which statistical test is used, and the variability between the samples, N will usually be more than a single sample. When comparing samples from a single storm event, a range of readings will be obtained. Almost all samples from that source will fall into that range. The likely range of readings can be expressed through the use of a statistical confidence interval for the parameter being sampled. Confidence intervals are expressed as probabilities, such as 95% confidence or 97% confidence. The size of a confidence interval will be determined by the variability in the samples from the single source and the number of samples collected.

Once the sampling is completed and results returned from the laboratory, compare the concentration of the appropriate parameter (see Section 2.3 Deciding What Constituents to Sample for)) derived from the upstream samples to the concentration of the same parameter from the downstream samples (from the same storm event). It is expected that every sample will be different. (This would be true even if there were not construction activities, in light of the variability of stream conditions, explained above.) Rather, compare the samples to see if there is a statistically significant difference between the central tendency (arithmetic mean, geometric mean, median, etc.) of the upstream samples and the downstream samples.

Estimate the magnitude of the difference in the central tendency between the upstream and downstream concentration values. The null hypothesis to be tested is: The difference between the downstream central tendency and the upstream central tendency is less than or equal to zero. The minimum acceptable confidence interval shall be 90%. Using the data, calculate a one-sided lower confidence limit (LCL) on the difference in central tendencies. If the numeric value of zero

is contained within the confidence interval (LCL), then you cannot reject the null hypothesis, and you would conclude that no impairment has occurred. If, however, the data indicates that the downstream central tendencies are significantly higher than the upstream, you cannot accept the null hypothesis. In this case there is the presumption that the discharges are contributing to the existing impairment.

If you did take samples of the effluent, and those samples are not consistent with the conclusion that the discharge is contributing to the existing impairment, take steps to determine what other source(s) is causing the increase in the downstream sampling. If you can show that there is a different source than your discharge, you should contact the appropriate RWQCB.

The hypothesis, sampling methodology, confidence interval, and statistical tests and assumptions must be defensible to the RWQCB. Since construction sites that discharge *directly* into impaired water bodies are not common in California, the local RWQCB will likely ask to review the SWPPP and the sampling and analysis strategy prior to construction activity.

3.7.2 Sources of sediment, silt and turbidity in a construction discharge

Conditions or areas on a site that may be causing sediment, silt, and/or turbidity in your storm water runoff may include:

- Exposed soil areas with inadequate erosion control measures
- Active grading areas
- Poorly stabilized slopes
- Lack of perimeter sediment controls
- Areas of concentrated flow on unprotected soils
- Poorly maintained erosion and sediment control measures
- Unprotected soil stockpiles
- Failure of an erosion or sediment control measure
- Unprotected Clayey soils

3.7.3 What To Do If Your Data Shows a Statistically Significant Increase Downstream of the Discharge

The CGP requires that BMPs be implemented on the construction site to prevent a net increase of sediment load in storm water discharges relative to pre-construction levels. Although the upstream reference (background) sample may not be representative of pre-construction levels at your site, it will provide a basis for comparison with the sample taken downstream of the construction site.

If the statistical tests of the upstream and downstream samples indicate an increase in silt, sediment and/or turbidity, follow the reporting requirements as shown in the Receiving Water Limitations of the CGP. If you have collected samples of the discharge from your site, use these results to help identify if it is your project that is discharging sediment into the receiving water. It is recommended that the following steps be taken as soon as possible.

- Identify the source of the silt, sediment or turbidity
- Review effectiveness of existing erosion control BMPs. The sediment may be coming from locations at the construction site where existing erosion control BMPs have been reduced in effectiveness. These BMPs should be evaluated to determine whether they are in need of maintenance.
- Review effectiveness of existing sediment control BMPs. The sediment may be coming from locations at the construction site where existing sediment control BMPs have been reduced in effectiveness. These BMPs should be evaluated to determine whether they are in need of maintenance.
- Look for evidence that there are too few sediment and erosion control BMPs. In inspecting the site, sources of sediment that either do not have BMPs or for which the BMPs appear to be insufficient in number or type may be identified.
- Repair or replace any BMP that has failed or is in need of maintenance
- Evaluate whether additional or alternative BMPs should be implemented to provide an effective combination of erosion and sediment control measures on the site. Do not rely solely on perimeter sediment controls, particularly where there are fine-grained soils (such as silts or clays) on the site. Implement erosion controls (source controls) that keep the soil in place, even on temporary slopes and rough graded areas, wherever possible and as necessary to prevent sediment from leaving the site.

If sampling and analysis during subsequent storm events shows that there is still a statistically significant difference, then repeat the steps above until the analytical results of the upstream concentration samples are within the confidence interval.

3.8 Retention of Data

Keep results of field measurements and laboratory analyses with the SWPPP, which is required to be kept on the project site until the NOT is filed and approved by the appropriate RWQCB. Keep training logs, Chain-Of-Custody (COC) forms and other documentation relating to sampling and analysis with the project's SWPPP. All records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated or after project completion.

4.0 Sampling Procedures

The collection and handling of storm water runoff samples requires care to ensure the integrity and validity of the samples. A Chain of Custody (COC) form, must follow the sample from the

collection through the analysis process. Additional documentation to track other information of interest, e.g. field conditions, or required field measurements may also be used. This type of information is recorded on a field tracking form.

Collect all samples with care to ensure that the sample is representative of the runoff being tested, use the correct type of container, preserve samples in accordance with the test method's specifications, and store at the appropriate temperature until delivered to an analytical laboratory. Some types of samples have very short holding times and must be analyzed before this holding time is exceeded. Sample handling requirements and documentation form the basis of your sampling quality assurance program.

Before starting any sampling program, contact the analytical laboratory that you plan to use to analyze your samples. Make sure to select a laboratory that will provide you with the support that you need, such as, properly cleaned and preserved sampling containers and COC forms. Some laboratories can assist in identifying courier services available to transport samples to the laboratory, or may be able to provide sampling service for you. Work out all of these details in advance of sample collection. Consult the analytical laboratory on what additional samples will be required for quality assurance and quality control purposes.

Both field and/or analytical analysis methods can be used to meet the Permit requirements. Field techniques have the advantage of providing immediate results, however, there are only a limited number of analyses that can be done in the field. Analytical laboratories can analyze for a wide range of parameters, but the data may take several weeks or longer to get back.

Some constituents (e.g. pH) can be evaluated in the field with special equipment. Field samples must be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed. Field equipment must be used by trained staff and the equipment must be calibrated and maintained according to the manufacturer's specifications.

Laboratory analyses should be conducted by a laboratory that is currently accredited by the California Department of Health Services Environmental Laboratory Accreditation Program (ELAP). Analyses must be conducted in accordance with 40 CFR Part 136.

You may refer to the California Department of Transportation (Caltrans) *Guidance Manual: Stormwater Monitoring Protocols (Second Edition)*, July 2000 to assist you in developing a sampling and analysis program. This document may be downloaded from the Caltrans Website, at

<http://www.dot.ca.gov/hq/construc/stormwater/SamplingGuidanceManual.pdf>

Figure 4-1 is an outline for a typical comprehensive storm water sampling and analysis plan. As some laboratories may have specific requirements for sample collection and handling, specific information or requirements on your samples should be checked with your laboratory.

- 1 PROJECT OVERVIEW/DESCRIPTION
 - 1.1 Description of why the project is being conducted
 - 1.2 Description of who is conducting the project
 - 1.3 General scope of monitoring activities
 - 1.4 Project organization/roles and responsibilities
 - 2 MONITORING SITES
 - 2.1 Site location (map)
 - 2.2 Written driving directions
 - 2.3 Site access instructions (gates, locks, keys, combinations)
 - 2.4 Notification procedures
 - 3 ANALYTICAL CONSTITUENTS
 - 3.1 List of constituents for sampling and analysis (including sample collection methods, container type, volume required, preservation and laboratory performing analysis)
 - 4 DATA QUALITY OBJECTIVES (DQOs)
 - 4.1 Analytical reporting limits
 - 4.2 Analytical precision, accuracy and completeness
 - 5 FIELD EQUIPMENT MAINTENANCE
 - 5.1 Equipment calibration
 - 5.2 Equipment maintenance
 - 5.3 Equipment cleaning (bottles/lids/tubing)
 - 6 MONITORING PREPARATION AND LOGISTICS
 - 6.1 Weather tracking
 - 6.2 Storm selection criteria
 - 6.3 Storm action levels
 - 6.4 Communications/notification procedures
 - 6.5 Sample bottle order
 - 6.6 Sample bottle labeling
 - 6.7 Field equipment preparation
 - 7 SAMPLE COLLECTION, PRESERVATION AND DELIVERY
 - 7.1 Sample collection methods
 - 7.2 Field measurement methods
 - 7.3 Field equipment list
 - 7.4 Sample containers, preservation and handling
 - 7.5 QA/QC sample collection methods
 - 7.6 Sample labeling (site names, codes, etc.)
 - 7.7 Composite sample splitting
 - 7.8 Forms and procedures for documenting sample collection and field measurements
 - 7.9 Laboratory communication procedures
 - 7.10 Sample shipping/delivery, chain-of-custody
 - 8 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)
 - 8.1 Field procedures for QA/QC sample collection
 - 9 LABORATORY SAMPLE PREPARATION AND ANALYTICAL METHODS
 - 9.1 Laboratory sample preparation procedures
 - 9.2 Analytical constituent table (including analytical methods, holding times and reporting limits)
 - 10 DATA MANAGEMENT AND REPORTING PROCEDURES
 - 10.1 Analytical data validation
 - 10.2 Electronic data transfer
 - 10.3 Filing of electronic and hard copy data
 - 10.4 Reports
- APPENDICES
- A Clean Sampling Techniques
 - B Health and Safety Plan

Figure 4-1 Outline for a Typical Storm Water Sampling and Analysis Plan

5.0 Definitions

Chain of Custody (COC) Form

The COC Form is a form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

Direct Discharge

Direct discharge means storm water runoff that flows from a construction site directly into a 303(d) water body listed for sedimentation, siltation, or turbidity. Storm water runoff from the construction site is considered a direct discharge to a 303(d) listed water body unless it first flows through:

- 1) A municipal separate storm sewer system (MS4) that has been formally accepted by and is under control and operation of a municipal entity;
- 2) A separate storm water conveyance system where there is co-mingling of site storm water with off-site sources; or
- 3) A tributary or segment of a water body that is not listed on the 303d list before reaching the 303d listed water body or segment.

Discharger

The discharger is the person or entity subject to the CGP.

Electrical Conductivity (EC)

EC is a measure of the ability of water to carry an electric current. This ability depends on the presence of ions, their concentration, valence, mobility and temperature. EC measurements can give an estimate of the variations in the dissolved mineral content of storm water in relation to receiving waters.

Field Measurements

Field measurements refers to water quality testing performed in the field with portable field-testing kits or meters.

Field Tracking Form (FTF)

The FTF is a form that serves as a guide to sampling crews to obtain sampling information and to prescribe and document sample collection information in the field. The FTF usually contains sample identifiers, sampling locations, requested analyses, Quality Control (QC) sample identifiers, special instructions, and field notes.

Holding Time

Holding time is specified by the analytical method and is the elapsed time between the time the sample is collected and the time the analysis must be initiated.

pH

The pH is universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Reference Sample

A sample taken from an undisturbed part of the construction site or from an undisturbed site immediately upstream from a construction site. The reference sample is used for comparison with samples taken from the active construction site. It is the same set of samples that is referred to as an uncontaminated sample in the Permit.

Sampling and Analysis Plan

A document that describes how the samples will be collected and under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Sediment

Sediment is solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation/Siltation

Sedimentation/siltation is the process of sediment/silt deposition.

Settleable Solids

The settleable solids (SS) test measures the solid material that can be settled within a water column during a specified time frame. This typically is tested by placing a water sample into an Imhoff settling cone and allowing the solids to settle by gravity. Results are reported either as a volume (mL/L) or a weight (mg/L).

Silt

Silt are soil particles between 0.05mm and 0.002mm in size. (For the purposes of its use here, it also includes clay, which is categorized by a particle size less than 0.002mm.)

Soil Amendment

Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water. Certain soil amendments may not be visible in site runoff. Soil amendments likely to fall in this category include lime, cementitious binders, chlorides, emulsions, polymers, soil stabilizers, and tackifiers applied as a stand-alone treatment (i.e., without mulch). Even some of these products may bind with the soil, and thus be visible. In contrast, plant fibers (such as straw or hay), wood and recycled paper fibers (such as mulches and matrices), bark or wood chips, green waste or composted organic materials, and biodegradable or synthetic blanket fibers are soil amendments that are likely to be visible in storm water runoff.

Suspended Sediment Concentration (SSC)

The suspended sediment concentration (SSC) test measures the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

Total Suspended Solids (TSS)

Suspended solids in a water sample include inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/ animal waste, particles related to industrial/sewage waste, etc. The total suspended solids test (TSS) test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

Turbidity

Cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The scattering of light increases with a greater suspended load. Turbidity is commonly measured in Nephelometric Turbidity Units (NTU).

6.0 Sources of Further Assistance

Regional Water Quality Control Boards

Regional Water Quality Control Board	Address	Contact Name E-mail	Telephone/Fax
NORTH COAST REGION	5550 Skylane Blvd., Suite A Santa Rosa, CA 95403	John Short shorj@rb1.swrcb.ca.gov	(707) 576-2065 FAX: (707) 523-0135
SAN FRANCISCO BAY REGION	1515 Clay St., Suite 1400 Oakland, CA 94612	Mark Johnson stu36@rb2.swrcb.ca.gov	(510) 622-2493 FAX: (510) 622-2460
CENTRAL COAST REGION	895 Aerovista Place., Suite 101 San Luis Obispo, CA 93401	Jennifer Bitting jbitting@rb3.swrcb.ca.gov	(805) 549-3334 FAX: (805) 543-0397
LOS ANGELES REGION	320 W. 4th St., Suite 200 Los Angeles, CA 90013	Ejigu Soloman (Ventura County) esoloman@rb4.swrcb.ca.gov	213) 576-6727 FAX: (213) 576-6686
CENTRAL VALLEY REGION Sacramento Office	11020 Sun Center Drive, #200 Rancho Cordova, CA 95670	Sue McConnell mcconn@rb5s.swrcb.ca.gov George Day DayG@rb5s.swrcb.ca.gov Dannas Berchtold BerchtD@rb5s.swrcb.ca.gov Rich Muhl MuhlR@rb5s.swrcb.ca.gov	(916) 464-4798 FAX: (916) 464-4681 (916) 464-6404 FAX: (916) 464-4681 (916) 464-4683 FAX: (916) 464-4681 (916) 464-4749 FAX: (916) 464-4681
CENTRAL VALLEY REGION Fresno Branch Office	E. Street Fresno, CA 93706	Brian Erlandsen ErlandsenB@rb5f.swrcb.ca.gov	(559) 445-6046 FAX: (559) 445-5910
CENTRAL VALLEY REGION Redding Branch Office	415 Knollcrest Dr. Redding, CA 96002	Carole Crowe crowec@rb5r.swrcb.ca.gov	(530) 224-4849 FAX: (530) 224-4857
LAHONTAN REGION South Lake Tahoe Office	2501 Lake Tahoe Blvd. South Lake Tahoe, CA 96150	Jason Churchill jchurchill@rb6s.swrcb.ca.gov	(530) 542-5571 FAX: (530) 544-2271
LAHONTAN REGION Victorville Office	15428 Civic Dr., Suite 100 Victorville, CA 92392	Doug Feay Dfeay@rb6v.swrcb.ca.gov Ted Saari Tsaari@rb6v.swrcb.ca.gov	(760) 241-7353 FAX: (760) 241-7308 (760) 241-7407

Regional Water Quality Control Board	Address	Contact Name E-mail	Telephone/Fax
COLORADO RIVER BASIN REGION	73-720 Fred Waring Dr., Suite 100 Palm Desert, CA 92260	Abdi Haile haila@rb7.swrcb.ca.gov Rosalyn Fleming flemr@rb7.swrcb.ca.gov	(760) 776-8939 FAX: (760) 341-6820 (760) 776-8939 FAX: (760) 341-6820
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State Water Resources Control Board
Division of Water Quality
Storm Water Permit Section
P.O. Box 1977
Sacramento, CA 95812-1977
Construction Inquiry Line: (916) 341-5537
Web Site: <http://www.waterboards.ca.gov/>
e-mail: stormwater@waterboards.ca.gov

How to Obtain a List of State Certified Laboratories

http://www.dhs.ca.gov/ps/ls/elap/html/lablist_county.htm

Other Useful Web Sites

California Stormwater Quality Association <http://www.casqa.org/>

California Department of Transportation

Environmental Program <http://www.dot.ca.gov/hq/env/index.htm>

Storm Water Management Program <http://www.dot.ca.gov/hq/env/stormwater/>

7.0 Explanation of Sampling and Analysis Requirements

The sampling and analysis provisions were added to the CGP in response to the writ of mandate issued in *San Francisco BayKeeper v. California State Water Resources Control Board* (Sacramento County Superior Court, No. 99CS01929). The SWRCB has now been directed to provide explanation and direction for dischargers subject to the sampling and analysis requirements. One issue that is at the heart of this direction is that the SWRCB must explain how dischargers should interpret the results of the required sampling and analysis in deciding whether they are in compliance with the permit's receiving water limitations requirements. In essence, can the sampling and analysis results be used to provide a reliable answer to the question whether the discharge is causing or contributing to exceedance of water quality standards? As is explained below, the answer is a qualified "yes," in that the results must be used in concert with other information and in accordance with a logical process exercising best professional judgment. The results from the sampling and analysis will provide information regarding whether or not the BMPs are effective, and may provide some evidence of causing or contributing to exceedance of water quality standards. But the sampling and analysis requirements in a storm water permit are ultimately a diagnostic tool, and are not a guaranteed method of determining compliance with the receiving water limitations.

7.1 Requirement for Compliance With Water Quality Standards

The SWRCB is well aware of the requirement that it must issue industrial storm water permits, including the CGP, with requirements that require "strict compliance" with water quality standards. (CWA §402(p)(3)(A).) It is also aware that USEPA has concluded that in general it is not appropriate or legally required to include numeric, water quality-based effluent limitations in storm water permits. (40 CFR 122.44(k)(2).) In addition, we note that USEPA does not require sampling and analysis in industrial storm water permits (40 CFR §122.44(i)(4)) and it has elected not to include any sampling or analysis requirements in its own recently issued general construction permit. (See, <http://cfpub.epa.gov/npdes/stormwater/cgp.cfm>.) USEPA has explained the limitations of sampling and analysis in industrial storm water permits. (See, 57 Fed. Reg. 11394 et seq. (1992).)

USEPA has addressed the relationship between BMPs and water quality standards, and has determined that almost all storm water discharges can be adequately controlled to meet water quality standards through BMPs. (NPDES Storm Water Program Questions and Answers, 1/21/04.) USEPA states that to evaluate effectiveness, NPDES permits may at the discretion of the permitting authority require visual inspections, evaluation of environmental indicators or measurable goals, effluent monitoring, or in-stream monitoring. (*Id.*) USEPA has made clear, both in its regulations and its guidance documents, that monitoring requirements are not necessary to enforce compliance with water quality standards. (In fact, neither EPA nor any state we are aware of has chosen to include monitoring requirements equivalent to, or more robust than, those already in place in the CGP.) Certainly, there is no legal requirement that the permitting authority must "prove" that a specific monitoring result is conclusive evidence of exceedance of a water quality standard. USEPA has conducted studies and modeling showing that existing permit programs as of 2003 were already capable of controlling approximately 80-90% of sediment runoff from construction sites, and that more stringent rules would remove

only 1% more. (USEPA Withdrawal of Proposed Effluent Limitation Guideline for Construction Industry, Volume 69, Federal Register 22472 et seq., April 26, 2004.) In conducting its state equivalency analysis, USEPA evaluated all states' programs, including California's, and determined that these were adequate and that further requirements were not mandated for compliance with federal law.

In USEPA's analysis of monitoring for construction (EPA-821-R-02-007), it concludes that planning monitoring for storm water is not possible because the flows are highly variable and temporarily stochastic. USEPA also notes that several of the criteria that could be used have special measurement problems because they are based on trapping efficiency, which is very difficult to measure. The most commonly used measurements, such as TSS, also have problems because to measure average or peak TSS it is necessary to measure TSS in the effluent over the duration of the outflow hydrograph as well as the flow rate. This requires that multiple samples be taken and that the samples be centered around the peak discharge. This is time consuming and difficult since the timing of an event and the timing of the peak discharge are not known beforehand. The average concentration is a weighted concentration, using flow rate as a weighting function.

USEPA also conducted an extensive evaluation of the literature to identify pollutants present in storm water discharges from construction sites. They found that while the literature contains extensive information on pollutants present in storm water discharges from urban areas, there were little data available on pollutants present in storm water discharges from construction sites during the active construction phase, other than for sediment, TSS and turbidity. USEPA was not able to identify sufficient data in the literature to warrant development of controls specific to pollutants other than sediment, TSS and turbidity in storm water discharges from construction sites. Some literature suggests that pollutants adhere to sediment, so that regulating TSS should also act as a control for other pollutants.

USEPA also evaluated the inclusion of organics, pesticides, and bacteria as potential pollutants of concern, but the literature indicated that control of these pollutants through conventional storm water management strategies is potentially much more difficult, and that there are little data linking their presence in storm water discharges directly with new land development activities. Source control (implementation of BMPs) may factor greatly into controlling these pollutant sources.

Permit compliance is based on the degree of control that can be achieved using various levels of pollution control technology (BMPs), a visual inspection requirement, coupled with parameter sampling in the instances where exposure has been determined. A storm water sample for non-visible pollutants indicating contamination is not conclusive proof of either a receiving water violation or of compliance with the Permit. But, it should give the discharger enough information to eliminate the source, detain the discharge, improve the BMPs, or take whatever action is necessary to abate the problem.

In the case of a direct discharge of sediment to a water body listed as impaired by sediment, sampling downstream of the discharge that shows a statistically significant increase in sediment over the upstream monitoring is strong evidence that the discharge from the construction site is causing or contributing to the impairment. We have suggested, however, that dischargers who

conduct such sampling should also sample the effluent. They may use the results of such sampling to overcome this presumption should the effluent sampling not be consistent with the downstream results. The case of a direct discharge of sediment to a water body impaired by sediment is a far simpler case than discharges that are indirect, that contain pollutants for which there may be assimilative capacity, or that contain pollutants that may be diluted in the receiving water. In those cases there is no simple way to conclude from sampling and analysis whether an applicable water quality standard is impacted by the storm water discharge. Instead, the data are most useful in alerting the discharger to the need to review BMPs and source control and should trigger a visual inspection.

The final determination as to whether discharges are in compliance with water quality standards will be made by RWQCBs through enforcement and other compliance activities. The sampling and analysis results are relevant, as is visual inspection and evaluation of BMPs. This method of assessment is known as "best professional judgment" and is consistent with USEPA's approach to regulating storm water discharges. This is the appropriate and lawful method of regulation pending adoption of effluent limitation guidelines by USEPA. (CWA §301.) USEPA proposed such guidelines for construction sites, but decided against adopting effluent limitation guidelines for storm water discharges associated with construction activity. (Effluent Guidelines Construction and Development Fact Sheet: Final Action - Selection of Non-Regulatory Option; EPA 821-F-04-001; March 2004; final action is at Volume 69, Federal Register 22472 et seq., April 26, 2004.) In taking this Final Action, USEPA concluded that the current system that allows states to develop their own programs is adequate and will result in "significant improvements in water quality and in the control of discharges of construction site stormwater runoff." In conducting its investigation of existing programs, USEPA found that every state already has regulations and programs in place that incorporate most of the provisions that USEPA considered in its most stringent proposal. USEPA further states that the following components of a construction program are: (1) Require preparation of a SWPPP; (2) Require site inspections by dischargers on a regular basis; (3) Require a combination of erosion and sediment controls; and (3) Require stabilization of soils after construction. USEPA decided that the existing programs (which do not require monitoring) are adequate and that any further regulatory requirements imposed by USEPA would be too costly and "would provide only marginal environmental improvements over regulations already in place." USEPA further concluded that additional controls would make housing unaffordable. Even when USEPA initially proposed adopting an effluent limitation guideline, it rejected even considering any monitoring requirements. In discussing the option of requiring monitoring in construction permits, USEPA listed several concerns, including that a national monitoring requirement would be impractical and that monitoring receiving waters at most construction sites is infeasible. (Effluent Limitation Guidelines and New Source Performance Standards for the Construction and Development Category: Proposed Rule, 67 Federal Register 42644, 42658-9 (6/24/02).) USEPA concluded that: "All of these factors would add significant expense to the construction process, with little or no added assurance in the effectiveness of control measures or expected environmental benefits." (Id.)

7.2 Background Contamination

The Court asked the SWRCB to explain the need for background (reference) sampling for non-visual pollutants. In essence, the Court question is why is it relevant whether the construction activity “increased” the level of pollutants in the runoff if pre-existing pollutants in runoff could also be of concern. There are several responses to this question. First, the CGP is intended to be a permit for storm water discharges associated with construction activity. (CWA §402(p); construction that disturbs greater than one acre is considered an industrial activity (40 CFR §122.26(b)(14)(x) and (15).) At this time, Congress has determined that it is not appropriate to regulate storm water runoff in general, and that only specified types of storm water discharges are subject to permitting. In fact, even at industrial sites, only the portions of the site that are used for industrial activities are subject to permitting. (40 CFR §122.26(b)(14).) Second, the focus of the CGP is on BMPs, and assuring that they are effective in preventing pollutants associated with construction activity from entering receiving waters. Where there are pollutants entering receiving waters, the required action is, through the iterative process in the Receiving Water Limitations, to evaluate and improve BMPs. Eliminating the source of contamination is the most direct and desirable approach to regulating construction runoff.

Regardless of whether a construction site owner *could* be held liable for historical contaminants running off the site, the purpose of the “reference” sample is clear: the permit does not contain numeric effluent limitations and is based on the BMP approach.¹ The two samples compare whether the BMPs that have been installed to prevent the non-visible pollutants associated with construction activity from entering receiving waters are effective. If “control samples” were not taken, the use of sampling to help determine permit compliance would be thwarted. If BMPs, including good housekeeping (source control) BMPs, are properly installed and maintained, they will effectively control the transportation of most pollutants. The background sampling will verify this fact. It is noted that the permit does require identification of historical pollutants, including pollutants that are the result of past usage. (CGP section A.5.b.3.) Sampling for these pollutants is required if the construction activity (e.g., disturbance of soil impacted by prior use) result in the mobilization and runoff of these pollutants.

The Court stated that USEPA documents indicate that reference sample collection and comparison may be unsuitable for persistent bio-accumulative pollutants. (The court cited USEPA’s Water Quality Guidance for the Great Lakes System: Supplementary Information Document (GLSID), at p. 63.) A California Court of Appeal recently had occasion to discuss the appropriate regulation of persistent bio-accumulative pollutants in NPDES permits. In *Communities for a Better Environment v. SWRCB* (2003) 109 Cal. App. 4th 1089 (hrg. denied), the court upheld a permit for a refinery that did not include final numeric effluent limitations for dioxins, which are bio-accumulative pollutants. The court upheld an approach relying on BMPs and a watershed approach to dealing with persistent bio-accumulative pollutants through other methods, such as a TMDL. The GLSID adopted by USEPA describes a watershed approach to controlling and eliminating persistent pollutants, which will include adoption of TMDLs. (See, GLSID at p. 247) It is not limited to adoption of NPDES permits, and does not even address

¹ The Court has upheld this approach. See, Ruling on Submitted Matter, *San Francisco BayKeeper v. California SWRCB*, p. 5-6.

construction storm water permits in the region. The reference on page 63 concerns the appropriate approaches for TMDLs, not for construction storm water permits. USEPA concludes in the GLSID that the TMDL process is the appropriate means of effectively addressing persistent bio-accumulative pollutants.

Pollutants such as the Persistent Bio-accumulative and Toxic chemicals (PBT) currently being addressed under USEPA's PBT initiative ² are not closely associated with modern day construction activity. The listed pesticides could possibly be found, however, as historic pollutants in the soil if the construction site had been used for agriculture prior to the 1970s (the 1990s in the case of toxaphene). Information about PBTs can be found through http://www.waterboards.ca.gov/stormwtr/gen_const.html. Persistent bio-accumulative pollutants are strongly associated with soils and soil particles, so an aggressive erosion and sediment control program combined with visual inspections is the most understandable and cost-effective approach to controlling the discharge of such pollutants from construction activity.

If the area that the construction site is located in has prior contamination from PBTs, such issues should be dealt with on a watershed-based approach, such as a TMDL for the particular pollutant. The Construction CGP is not intended to address such issues. On the other hand, the permit does require all dischargers to control soil erosion and the movement of products of erosion off the site via the storm water discharge. Mobilization of pesticide residue by construction activity may trigger sampling and analysis requirements.

7.3 Parameters to Sample for to Determine the Presence of Non-Visible Pollutants in Runoff

It has been suggested that construction dischargers should consult the CTR, and then design a sampling strategy to sample their discharge for all non-visible CTR pollutants based on the numerical values provided. The CTR pollutants and numerical limits, however, have limited relevance to construction activity or storm water pollution from construction sites. The CTR pollutants currently known to be used and commonly found on construction sites can be found through http://www.waterboards.ca.gov/stormwtr/gen_const.html.

Of greater concern for construction discharges are the pollutants found in materials used in large quantities throughout California and exposed throughout the rainy season such as cement, fly-ash, and other recycled materials or by-products of combustion. (But many of these materials may be visible in runoff, affecting color for example.) The water quality standards for these materials will depend on their composition. Some of the more common storm water pollutants from construction activity such as glyphosate (herbicides), diazinon and chlopyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants) are not CTR pollutants. The use of diazinon and chlopyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if applications come into contact with storm water.

Other more common storm water contamination problems resulting from construction activity such as high pH values from cement and gypsum, high pH and TSS from wash waters and

² <http://www.epa.gov/opptintr/pbt/aboutpbt.htm>

chemical and fecal contamination from portable toilets are also not CTR pollutants. Some of these constituents do have numeric water quality objectives in individual Basin Plans, but many do not and are subject to narrative water quality standards such as not causing toxicity. This Fact Sheet provides direction on how to ascertain the applicable water quality standards for the receiving water. Of more use will be information the SWRCB will distribute upon completion of a contract with the University of California, which will list the most common pollutants, describe which construction materials they are associated with, and suggest parameters for sampling. At this time, dischargers are encouraged to discuss these issues with RWQCB staff and their own knowledgeable representative or Storm Water Quality Professionals..

7.4 The Watershed Approach to Storm Water Permitting

USEPA has endorsed a watershed approach to storm water permitting that focuses on BMPs in lieu of numeric effluent limitations and visual inspection and indicator monitoring in lieu of sampling for individual pollutant parameters. (Questions and Answers Regarding Implementation of an Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, 61 Fed. Reg. 57424 (11/6/96)). In a memorandum dated November 22, 2002, USEPA issued guidance on the interaction between storm water permits and TMDLs. The memorandum explains that, even in the case where a TMDL has been finalized and a wasteload allocation established for storm water discharges, the inclusion of numeric effluent limitations will be "rare." The memorandum therefore discusses monitoring requirements in BMP-based permits. It states that the monitoring should assess the effectiveness of the BMPs (i.e., appropriate monitoring is visual inspection) and *if monitoring for storm water is required, it should be consistent with the state's watershed approach.*

7.5 References and Record for this Guidance Document

In preparing this guidance document, the SWRCB has relied upon numerous background materials including federal statutes, regulations and guidance materials. These materials include Clean Water Act sections 303(d) and 402(p) and federal regulations implementing section 402(p) including 40 CFR sections 122.26, 122.44, 122.48, and Part 131. The SWRCB has also relied several guidance documents from USEPA. These include the preambles to the various storm water regulatory actions: 55 Fed. Reg. 47990 et seq. (11/16/90), 57 Fed. Reg. 11394 et seq. (4/2/92), and 64 Fed. Reg. 68722 et seq. The SWRCB has relied on the Porter-Cologne Water Quality Control Act (Water Code section 13000 et seq.), and implementing state regulations at Title 23, California Code of Regulations. The SWRCB has also relied on relevant court decisions, including: *Communities for a Better Environment v. SWRCB* (2003) 109 Cal. App. 4th 1089 (hrg. denied) (Water Boards have broad discretion in adopting effluent limitations for impaired waters). The SWRCB has also reviewed the recently-adopted USEPA general construction permit, published at <http://cfpub.epa.gov/npdes/stormwater/cgp.cfm>. and USEPA's decision not to adopt effluent limitations guidelines for storm water discharges from construction activities (Volume 69, Federal Register 22472 et seq., April 26, 2004) The SWRCB has also reviewed the USEPA multi-sector general permit for industrial activities (65 Fed. Reg. 64746 et seq. (10/30/00) and a general construction permit issued by USEPA Region IV (65 Fed. Reg. 25122 et seq. (4/28/00)). The record also contains submittals received by the SWRCB from

interested persons including the Keepers organizations, the Building Industry Legal Defense Foundation and the California Building Industry Association.

APPENDIX A

WATER QUALITY OBJECTIVES FOR SUSPENDED MATERIALS, SETTEABLE MATERIALS, SEDIMENT AND TURBIDITY

Below is a compilation of the water quality objectives for suspended materials, settleable material, sediment and turbidity as of August 2003 for each of the Regional Water Quality Control Boards. The water quality objectives are found in chapter 3 (unless otherwise noted) of the RWQCB's Basin Water Quality Control Plan (Basin Plan). Some of the weblinks go directly to Chapter 3 and others will go to the Basin Plan.

North Coast Regional Water Quality Control Board – Region 1

<http://www.waterboards.ca.gov/rwqcb1/down/032202basin-plan.pdf>

Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Setteable Material

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity

Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

San Francisco Bay Regional Water Quality Control Board – Region 2

http://www.waterboards.ca.gov/rwqcb2/Basin Plan/chap_3_bp.pdf

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. Controllable water quality factors shall not cause a detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life.

Setteable Material

Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses.

Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU.

Central Coast Regional Water Quality Control Board - Region 3

http://www.waterboards.ca.gov/rwqcb3/BasinPlan/BP_text%5Cchapter_3%5CChapter3.htm

Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Setteable Material

Waters shall not contain setteable material in concentrations that result in deposition of material that causes nuisance or adversely affects beneficial uses.

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Increase in Turbidity attributable to controllable factors shall not exceed the following limits:

1. Where natural turbidity is between 0 and 50 Jackson Turbidity Units (JTU), increases shall not exceed 20 percent.
2. Where natural turbidity is between 50 and 100 JTU, increases shall not exceed 10 JTU
3. Where natural turbidity is greater than 100 JTU, increases shall not exceed 10 percent.

Allowable zones of dilution within which higher concentrations will be tolerated will be defined for each discharge in discharge permits.

Los Angeles Regional Water Quality Control Board - Region 4

[http://www.waterboards.ca.gov/rwqcb4/html/meetings/tmdl/Basin_plan/el_doc/BP3 Water Quality Objectives.pdf](http://www.waterboards.ca.gov/rwqcb4/html/meetings/tmdl/Basin_plan/el_doc/BP3%20Water%20Quality%20Objectives.pdf)

Solid, Suspended, or Setteable Materials

Waters shall not contain suspended or setteable material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable factors shall not exceed the following limits:

Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%.

Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.

Allowable zones of initial dilution within which higher concentrations will be tolerated may be defined for each discharge in specific Waste Discharge Requirements.

Central Valley Regional Water Quality Control Board – Region 5

Sacramento River and San Joaquin River Basins

http://www.waterboards.ca.gov/rwqcb5/available_documents/basin_plans/bsnplnab.pdf

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Settleable Material

Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Exceptions to the above limits will be considered when a dredging operation can cause an increase in turbidity. In those cases, an allowable zone of dilution within which turbidity in excess of the limits may be tolerated will be defined for the operation and prescribed in a discharge permit.

For Folsom Lake (50) and American River (Folsom Dam to Sacramento River) (51), except for periods of storm runoff, the turbidity shall be less than or equal 10 NTUs. To the extent of any conflict with the general turbidity objective, the more stringent applies.

For Delta waters, the general objectives for turbidity apply subject to the following: except for periods of storm runoff, the turbidity of Delta waters shall not exceed 50 NTUs in the waters of the Central Delta and 150 NTUs in other Delta waters. Exceptions to the Delta specific objectives will be considered when a dredging operation can cause an increase in turbidity. In this case, an allowable zone of dilution within which turbidity in excess of limits can be tolerated will be defined for the operation and prescribed in a discharge permit.

Tulare Lake Basin

http://www.waterboards.ca.gov/rwqcb5/available_documents/basin_plans/bsnpln5c.pdf

Sediment

The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Settleable Material

Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, the Regional Water Board may prescribe appropriate averaging periods provided that beneficial uses will be fully protected.

Lahontan Regional Water Quality Control Board - Region 6

<http://www.waterboards.ca.gov/rwqcb6/BPlan/Bplantxt.pdf>

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

Setteable Materials

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of setteable materials shall not be raised by more than 0.1 milliliter per liter.

Suspended Materials

Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

Colorado River Basin Regional Water Quality Control Board – Region 7

<http://www.waterboards.ca.gov/rwqcb7/documents/RB7Plan.pdf>

Suspended Solids and Setteable Solids

Discharges of wastes or wastewater shall not contain suspended or setteable solids in concentrations which increase the turbidity of receiving waters, unless it can be demonstrated to the satisfaction of the RWQCB that such alteration in turbidity does not adversely affect beneficial uses.

Sediment

The suspended sediment load and suspended sediment discharge rate to surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Santa Ana River Regional Water Quality Control Board – Region 8

<http://www.waterboards.ca.gov/~rwqcb8/pdf/R8BPlan.pdf>

(See Chapter 4)

Solids, Suspended and Setteable

Enclosed bays and estuaries shall not contain suspended or setteable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.

Turbidity

Increases in turbidity which result from controllable water quality factors shall comply with the following:

<u>Natural Turbidity</u>	<u>Maximum Increase</u>
0-50 NTU	20%
50-100 NTU	10 NTU
Greater than 100 NTU	10%

All enclosed bay and estuaries of the region shall be free of changes in turbidity which adversely affect beneficial uses

San Diego Regional Water Quality Control Board - Region 9

[http://www.waterboards.ca.gov/rwqcb9/programs/Chapter 3 Water Quality Objectives.pdf](http://www.waterboards.ca.gov/rwqcb9/programs/Chapter%203%20Water%20Quality%20Objectives.pdf)

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Suspended and Settleable Solids

Water shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.

Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Inland surface water shall not contain turbidity in excess of the numerical objectives described in Table 3-2. (This is reference to the Basin Plan; this table can be found via the weblink to the Region 9 Basin Plan).

Ground waters shall not contain turbidity in excess of the numerical objectives described in Table 3-3. (This is reference to the Basin Plan; this table can be found via the weblink to the Region 9 Basin Plan.)

The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed areas and dredging projects conducted in conformance with waste discharge requirements of the RWQCB. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

<u>Natural Turbidity</u>	<u>Maximum Increase</u>
0- 50 NTU	20% over natural turbidity level
50 - 100 NTU	10 NTU
Greater than 100 NTU	10% over natural turbidity level

In addition, within San Diego Bay, the transparency of bay waters, insofar as it may be influenced by any controllable factor, either directly or through induced conditions, shall not be less than 8 feet in more than

20 percent of the readings in any zone, as measured by standard Secchi disk. Wherever the water is less than 10 feet deep, the Secchi disk reading shall not be less than 80 percent of the depth in more than 20 percent of the readings in any zone.

STATE WATER RESOURCES CONTROL BOARD (SWRCB)
ORDER NO. 99 - 08 - DWQ
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT NO. CAS000002

WASTE DISCHARGE REQUIREMENTS (WDRS)
FOR
DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH
CONSTRUCTION ACTIVITY

The State Water Resources Control Board finds that:

1. Federal regulations for controlling pollutants in storm water runoff discharges were promulgated by the U.S. Environmental Protection Agency (USEPA) on November 16, 1990 (40 Code of Federal Regulations (CFR) Parts 122, 123, and 124). The regulations require discharges of storm water to surface waters associated with construction activity including clearing, grading, and excavation activities (except operations that result in disturbance of less than five acres of total land area and which are not part of a larger common plan of development or sale) to obtain an NPDES permit and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate storm water pollution.

On December 8, 1999 federal regulations promulgated by USEPA (40CFR Parts 9, 122, 123, and 124) expanded the NPDES storm water program to include storm water discharges from municipal separate storm sewer systems (MS4s) and construction sites that were smaller than those previously included in the program. Federal regulation 40 CFR § 122.26(b)(15) defines small construction activity as including clearing, grading, and excavating that result in land disturbance of equal to or greater than one acre or less than five acres or is part of a larger common plan of development or sale. Permit applications for small construction activities are due by March 10, 2003.

2. This General Permit regulates pollutants in discharges of storm water associated with construction activity (storm water discharges) to surface waters, except from those areas on Tribal Lands; Lake Tahoe Hydrologic Unit; construction projects which disturb less than one acre, unless part of a larger common plan of development or sale; and storm water discharges which are determined ineligible for coverage under this General Permit by the California Regional Water Quality Control Boards (RWQCBs). Attachment 1 contains addresses and telephone numbers of each RWQCB office.
3. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to separate storm sewer systems or other watercourses within their jurisdiction, as allowed by State and Federal law.

4. To obtain authorization for proposed storm water discharges to surface waters, pursuant to this General Permit, the landowner (discharger) must submit a Notice of Intent (NOI) with a vicinity map and the appropriate fee to the SWRCB prior to commencement of construction activities. In addition, coverage under this General Permit shall not occur until the applicant develops a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the requirements of Section A of this permit for the project. For proposed construction activity conducted on easements or on nearby property by agreement or permission, or by an owner or lessee of a mineral estate (oil, gas, geothermal, aggregate, precious metals, and/or industrial minerals) entitled to conduct the activities, the entity responsible for the construction activity must submit the NOI and filing fee and shall be responsible for development of the SWPPP.
5. If an individual NPDES Permit is issued to a discharger otherwise subject to this General Permit or if an alternative General Permit is subsequently adopted which covers storm water discharges regulated by this General Permit, the applicability of this General Permit to such discharges is automatically terminated on the effective date of the individual permit or the date of approval for coverage under the subsequent General Permit.
6. This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with section 13389 of the California Water Code.
7. The SWRCB adopted the California Ocean Plan, and the RWQCBs have adopted and the SWRCB has approved Water Quality Control Plans (Basin Plans). Dischargers regulated by this General Permit must comply with the water quality standards in these Basin Plans and subsequent amendments thereto.
8. The SWRCB finds storm water discharges associated with construction activity to be a potential significant sources of pollutants. Furthermore, the SWRCB finds that storm water discharges associated with construction activities have the reasonable potential to cause or contribute to an excursion above water quality standards for sediment in the water bodies listed in Attachment 3 to this permit.
9. It is not feasible at this time to establish numeric effluent limitations for pollutants in storm water discharges from construction activities. Instead, the provisions of this General Permit require implementation of Best Management Practices (BMPs) to control and abate the discharge of pollutants in storm water discharges.
10. Discharges of non-storm water may be necessary for the completion of certain construction projects. Such discharges include, but are not limited to: irrigation of vegetative erosion control measures, pipe flushing and testing, street cleaning, and dewatering. Such discharges are authorized by this General Permit as long as they (a) do comply with Section A.9 of this General Permit, (b) do not cause or contribute to violation of any water quality standard, (c) do not violate any other provision of this

General Permit, (d) do not require a non-storm water permit as issued by some RWQCBs, and (e) are not prohibited by a Basin Plan. If a non-storm water discharge is subject to a separate permit adopted by a RWQCB, the discharge must additionally be authorized by the RWQCB permit.

11. Following adoption of this General Permit, the RWQCBs shall enforce the provisions herein including the monitoring and reporting requirements.
12. Following public notice in accordance with State and Federal laws and regulations, the SWRCB in a public meeting on June 8, 1998, heard and considered all comments. The SWRCB has prepared written responses to all significant comments.
13. This Order is an NPDES permit in compliance with section 402 of the Clean Water Act (CWA) and shall take effect upon adoption by the SWRCB provided the Regional Administrator of the USEPA has no objection. If the USEPA Regional Administrator objects to its issuance, the General Permit shall not become effective until such objection is withdrawn.
14. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA section 404 and does not constitute a waiver of water quality certification under CWA section 401.
15. The Monitoring Program and Reporting Requirements are modified in compliance with a judgment in the case of San Francisco BayKeeper, et al. v. State Water Resources Control Board. The modifications include sampling and analysis requirements for direct discharges of sediment to waters impaired due to sediment and for pollutants that are not visually detectable in runoff that may cause or contribute to an exceedance of water quality objectives.
16. Storm water discharges associated with industrial activity that are owned or operated by municipalities serving populations less than 100,000 people are no longer exempt from the need to apply for or obtain a storm water discharge permit. A temporary exemption, which was later extended by USEPA, was provided under section 1068(c) of the Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991. Federal regulation 40 CFR § 122.26(e)(1)(ii) requires the above municipalities to submit permit application by March 10, 2003.
17. This permit may be reopened and modified to include different monitoring requirements for small construction activity than for construction activity over five (5) acres.

IT IS HEREBY ORDERED that all dischargers who file an NOI indicating their intention to be regulated under the provisions of this General Permit shall comply with the following:

A. DISCHARGE PROHIBITIONS:

1. Authorization pursuant to this General Permit does not constitute an exemption to applicable discharge prohibitions prescribed in Basin Plans, as implemented by the nine RWQCBs.
2. Discharges of material other than storm water which are not otherwise authorized by an NPDES permit to a separate storm sewer system (MS4) or waters of the nation are prohibited, except as allowed in Special Provisions for Construction Activity, C.3.
3. Storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance.
4. Storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of a reportable quantity listed in 40 CFR Part 117 and/or 40 CFR Part 302.

B. RECEIVING WATER LIMITATIONS:

1. Storm water discharges and authorized nonstorm water discharges to any surface or ground water shall not adversely impact human health or the environment.
2. The SWPPP developed for the construction activity covered by this General Permit shall be designed and implemented such that storm water discharges and authorized nonstorm water discharges shall not cause or contribute to an exceedance of any applicable water quality standards contained in a Statewide Water Quality Control Plan and/or the applicable RWQCB's Basin Plan.
3. Should it be determined by the discharger, SWRCB, or RWQCB that storm water discharges and/or authorized nonstorm water discharges are causing or contributing to an exceedance of an applicable water quality standard, the discharger shall:
 - a. Implement corrective measures immediately following discovery that water quality standards were exceeded, followed by notification to the RWQCB by telephone as soon as possible but no later than 48 hours after the discharge has been discovered. This notification shall be followed by a report within 14-calendar days to the appropriate RWQCB, unless otherwise directed by the RWQCB, describing (1) the nature and cause of the water quality standard exceedance; (2) the BMPs currently being implemented; (3) any additional BMPs which will be implemented to

prevent or reduce pollutants that are causing or contributing to the exceedance of water quality standards; and (4) any maintenance or repair of BMPs. This report shall include an implementation schedule for corrective actions and shall describe the actions taken to reduce the pollutants causing or contributing to the exceedance.

- b. The discharger shall revise its SWPPP and monitoring program immediately after the report to the RWQCB to incorporate the additional BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring needed.
- c. Nothing in this section shall prevent the appropriate RWQCB from enforcing any provisions of this General Permit while the discharger prepares and implements the above report.

C. SPECIAL PROVISIONS FOR CONSTRUCTION ACTIVITY:

- 1. All dischargers shall file an NOI and pay the appropriate fee for construction activities conducted at each site as required by Attachment 2: Notice of Intent--General Instructions.
- 2. All dischargers shall develop and implement a SWPPP in accordance with Section A: Storm Water Pollution Prevention Plan. The discharger shall implement controls to reduce pollutants in storm water discharges from their construction sites to the BAT/BCT performance standard.
- 3. Discharges of non-storm water are authorized only where they do not cause or contribute to a violation of any water quality standard and are controlled through implementation of appropriate BMPs for elimination or reduction of pollutants. Implementation of appropriate BMPs is a condition for authorization of non-storm water discharges. Non-storm water discharges and the BMPs appropriate for their control must be described in the SWPPP. Wherever feasible, alternatives which do not result in discharge of nonstorm water shall be implemented in accordance with Section A.9. of the SWPPP requirements.
- 4. All dischargers shall develop and implement a monitoring program and reporting plan in accordance with Section B: Monitoring Program and Reporting Requirements.
- 5. All dischargers shall comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to separate storm sewer systems or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs developed to comply with NPDES permits issued by the RWQCBs to local agencies.

6. All dischargers shall comply with the standard provisions and reporting requirements contained in Section C: Standard Provisions.
7. The discharger may terminate coverage for a portion of the project under this General Permit when ownership of a portion of this project has been transferred or when a phase within this multi-phase project has been completed. When ownership has transferred, the discharger must submit to its RWQCB a Change of Information Form (COI) Attachment 4 with revised site map and the name, address and telephone number of the new owner(s). Upon transfer of title, the discharger should notify the new owner(s) of the need to obtain coverage under this General Permit. The new owner must comply with provisions of Sections A. 2. (c) and B. 2. (b) of this General Permit. To terminate coverage for a portion of the project when a phase has been completed, the discharger must submit to its RWQCB a COI with a revised map that identifies the newly delineated site.
8. The discharger may terminate coverage under this General Permit for a complete project by submitting to its RWQCB a Notice of Termination Form (NOT), and the post-construction BMPs plan according to Section A.10 of this General Permit. Note that a construction project is considered complete only when all portions of the site have been transferred to a new owner; or the following conditions have been met:
 - a. There is no potential for construction related storm water pollution,
 - b. All elements of the SWPPP have been completed,
 - c. Construction materials and waste have been disposed of properly,
 - d. The site is in compliance with all local storm water management requirements, and
 - e. A post-construction storm water management plan is in place as described in the site's SWPPP.
9. This General Permit expires five years from the date of adoption.

D. REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) AUTHORITIES:

1. RWQCBs shall:
 - a. Implement the provisions of this General Permit. Implementation of this General Permit may include, but is not limited to requesting the submittal of SWPPPS, reviewing SWPPPs, reviewing monitoring reports, conducting compliance inspections, and taking enforcement actions.
 - b. Issue permits as they deem appropriate to individual dischargers, categories of dischargers, or dischargers in a geographic area. Upon issuance of such permits by a RWQCB, the affected dischargers shall no longer be regulated by this General Permit.
2. RWQCBs may require, on a case-by-case basis, the inclusion of an analysis of potential downstream impacts on receiving waterways due to the permitted construction.
3. RWQCBs may provide information to dischargers on the development and implementation of SWPPPs and monitoring programs and may require revisions to SWPPPs and monitoring programs.
4. RWQCBs may require dischargers to retain records for more than three years.
5. RWQCBs may require additional monitoring and reporting program requirements including sampling and analysis of discharges to water bodies listed in Attachment 3 to this permit. Additional requirements imposed by the RWQCB should be consistent with the overall monitoring effort in the receiving waters.
6. RWQCBs may issue individual NPDES permits for those construction activities found to be ineligible for coverage under this permit.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on August 19, 1999.

AYE: James M. Stubchaer
Mary Jane Forster
John W. Brown
Arthur G. Baggett, Jr.

NO: None

ABSENT: None

ABSTAIN: None

_____/s/
Maureen Marché
Administrative Assistant to the Board

SECTION A: STORM WATER POLLUTION PREVENTION PLAN

1. Objectives

A Storm Water Pollution Prevention Plan (SWPPP) shall be developed and implemented to address the specific circumstances for each construction site covered by this General Permit. The SWPPP shall be certified in accordance with the signatory requirements of section C, Standard Provision for Construction Activities (9). The SWPPP shall be developed and amended or revised, when necessary, to meet the following objectives:

- a. Identify all pollutant sources including sources of sediment that may affect the quality of storm water discharges associated with construction activity (storm water discharges) from the construction site, and
- b. Identify non-storm water discharges, and
- c. Identify, construct, implement in accordance with a time schedule, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in storm water discharges and authorized nonstorm water discharges from the construction site during construction, and
- d. Develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs).
- e. Identify a sampling and analysis strategy and sampling schedule for discharges from construction activity which discharge directly into water bodies listed on Attachment 3. (Clean Water Act Section 303(d) [303(d)] Water Bodies listed for Sedimentation).
- f. For all construction activity, identify a sampling and analysis strategy and sampling schedule for discharges that have been discovered through visual monitoring to be potentially contaminated by pollutants not visually detectable in the runoff.

2. Implementation Schedule

- a. For construction activity commencing on or after adoption of this General Permit, the SWPPP shall be developed prior to the start of soil-disturbing activity in accordance with this Section and shall be implemented concurrently with commencement of soil-disturbing activities.
- b. Existing permittees engaging in construction activities covered under the terms of the previous General Construction Permit SWPPP (WQ Order No.92-08-DWQ) shall continue to implement their existing SWPPP and shall implement any

necessary revisions to their SWPPP in accordance with this Section of the General Permit in a timely manner, but in no case more than 90-calender days from the date of adoption of this General Permit.

- c. For ongoing construction activity involving a change of ownership of property, the new owner shall review the existing SWPPP and amend if necessary, or develop a new SWPPP within 45-calender days.
- d. Existing permittees shall revise their SWPPP in accordance with the sampling and analysis modifications prior to August 1, 2001. For ongoing construction activity involving a change of ownership the new owner shall review the existing SWPPP and amend the sampling and analysis strategy, if required, within 45 days. For construction activity commencing after the date of adoption, the SWPPP shall be developed in accordance with the modification language adopted.

3. Availability

The SWPPP shall remain on the construction site while the site is under construction during working hours, commencing with the initial construction activity and ending with termination of coverage under the General Permit.

4. Required Changes

- a. The discharger shall amend the SWPPP whenever there is a change in construction or operations which may affect the discharge of pollutants to surface waters, ground waters, or a municipal separate storm sewer system (MS4). The SWPPP shall also be amended if the discharger violates any condition of this General Permit or has not achieved the general objective of reducing or eliminating pollutants in storm water discharges. If the RWQCB determines that the discharger is in violation of this General Permit, the SWPPP shall be amended and implemented in a timely manner, but in no case more than 14-calendar days after notification by the RWQCB. All amendments should be dated and directly attached to the SWPPP.
- b. The RWQCB or local agency with the concurrence of the RWQCB may require the discharger to amend the SWPPP.

5. Source Identification

The SWPPP shall include: (a) project information and (b) pollutant source identification combined with an itemization of those BMPs specifically chosen to control the pollutants listed.

- a. Project Information

- (1) The SWPPP shall include a vicinity map locating the project site with respect to easily identifiable major roadways, geographic features, or landmarks. At a minimum, the map must show the construction site perimeter, the geographic features surrounding the site, and the general topography.
- (2) The SWPPP shall include a site map(s) which shows the construction project in detail, including the existing and planned paved areas and buildings.
 - (a) At a minimum, the map must show the construction site perimeter; existing and proposed buildings, lots, roadways, storm water collection and discharge points; general topography both before and after construction; and the anticipated discharge location(s) where the storm water from the construction site discharges to a municipal storm sewer system or other water body.
 - (b) The drainage patterns across the project area must clearly be shown on the map, and the map must extend as far outside the site perimeter as necessary to illustrate the relevant drainage areas. Where relevant drainage areas are too large to depict on the map, map notes or inserts illustrating the upstream drainage areas are sufficient.
 - (c) Temporary on-site drainages to carry concentrated flow shall be selected to comply with local ordinances, to control erosion, to return flows to their natural drainage courses, and to prevent damage to downstream properties.
3. Information presented in the SWPPP may be represented either by narrative or by graphics. Where possible, narrative descriptions should be plan notes. Narrative descriptions which do not lend themselves to plan notes can be contained in a separate document which must be referenced on the plan.

b. Pollutant Source and BMP Identification

The SWPPP shall include a description of potential sources which are likely to add pollutants to storm water discharges or which may result in nonstorm water discharges from the construction site. Discharges originating from off-site which flow across or through areas disturbed by construction that may contain pollutants should be reported to the RWQCB.

The SWPPP shall:

- (1) Show drainage patterns and slopes anticipated after major grading activities are completed. Runoff from off-site areas should be prevented from flowing through areas that have been disturbed by construction unless appropriate conveyance systems are in place. The amount of anticipated storm water run-on must be considered to determine the appropriateness of the BMPs chosen. Show all calculations for anticipated storm water run-on, and describe all BMPs implemented to divert off-site drainage described in section A. 5 a. (2) (c) around or through the construction project.
- (2) Show the drainage patterns into each on-site storm water inlet point or receiving water. Show or describe the BMPs that will protect operational storm water inlets or receiving waters from contaminated discharges other than sediment discharges, such as, but not limited to: storm water with elevated pH levels from contact with soil amendments such as lime or gypsum; slurry from sawcutting of concrete or asphalt ;washing of exposed aggregate concrete; concrete rinse water; building washing operations; equipment washing operations; minor street washing associated with street delineation; and/or sealing and paving activities occurring during rains.
- (3) Show existing site features that, as a result of known past usage, may contribute pollutants to storm water, (e.g., toxic materials that are known to have been treated, stored, disposed, spilled, or leaked onto the construction site). Show or describe the BMPs implemented to minimize the exposure of storm water to contaminated soil or toxic materials.
- (4) Show areas designated for the (a) storage of soil or waste, (b) vehicle storage and service areas, (c) construction material loading, unloading, and access areas, (d) equipment storage, cleaning, and maintenance areas.
- (5) Describe the BMPs for control of discharges from waste handling and disposal areas and methods of on-site storage and disposal of construction materials and construction waste. Describe the BMPs designed to minimize or eliminate the exposure of storm water to construction materials, equipment, vehicles, waste storage areas, or service areas. The BMPs described shall be in compliance with Federal, State, and local laws, regulations, and ordinances.
- (6) Describe all post-construction BMPs for the project, and show the location of each BMP on the map. (Post-construction BMPs consist of permanent features designed to minimize pollutant discharges, including sediment, from the site after construction has been completed.) Also, describe the agency or parties to be the responsible party for long-term maintenance of these BMPs.

- (7) Show the locations of direct discharge from the construction site into a Section 303(d) list water body. Show the designated sampling locations in the receiving waters, which represent the prevailing conditions of the water bodies upstream of the construction site discharge and immediately downstream from the last point of discharge.
- (8) Show the locations designated for sampling the discharge from areas identified in Section A. 5. b. (2), (3), and (4) and Section A. 5. c. (1) and (2). Samples shall be taken should visual monitoring indicate that there has been a breach, malfunction, leakage, or spill from a BMP which could result in the discharge in storm water of pollutants that would not be visually detectable, or if storm water comes into contact with soil amendments or other exposed materials or contamination and is allowed to be discharged. Describe the sampling procedure, location, and rationale for obtaining the uncontaminated sample of storm water.

c. Additional Information

- (1) The SWPPP shall include a narrative description of pollutant sources and BMPs that cannot be adequately communicated or identified on the site map. In addition, a narrative description of preconstruction control practices (if any) to reduce sediment and other pollutants in storm water discharges shall be included.
- (2) The SWPPP shall include an inventory of all materials used and activities performed during construction that have the potential to contribute to the discharge of pollutants other than sediment in storm water. Describe the BMPs selected and the basis for their selection to eliminate or reduce these pollutants in the storm water discharges.
- (3) The SWPPP shall include the following information regarding the construction site surface area: the size (in acres or square feet), the runoff coefficient before and after construction, and the percentage that is impervious (e.g., paved, roofed, etc.) before and after construction.
- (4) The SWPPP shall include a copy of the NOI, and the Waste Discharge Identification (WDID) number. Should a WDID number not be received from the SWRCB at the time construction commences, the discharger shall include proof of mailing of the NOI, e.g., certified mail receipt, copy of check, express mail receipt, etc.
- (5) The SWPPP shall include a construction activity schedule which describes all major activities such as mass grading, paving, lot or parcel

improvements at the site and the proposed time frame to conduct those activities.

- (6) The SWPPP shall list the name and telephone number of the qualified person(s) who have been assigned responsibility for prestorm, poststorm, and storm event BMP inspections; and the qualified person(s) assigned responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

6. Erosion Control

Erosion control, also referred to as “soil stabilization” is the most effective way to retain soil and sediment on the construction site. The most efficient way to address erosion control is to preserve existing vegetation where feasible, to limit disturbance, and to stabilize and revegetate disturbed areas as soon as possible after grading or construction. Particular attention must be paid to large mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great. Mass graded construction sites may be exposed for several years while the project is being built out. Thus, there is potential for significant sediment discharge from the site to surface waters.

At a minimum, the discharger/operator must implement an effective combination of erosion and sediment control on all disturbed areas during the rainy season. These disturbed areas include rough graded roadways, slopes, and building pads. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single-most important factor in reducing erosion at construction sites. The discharger shall consider measures such as: covering with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, permanent seeding, and a variety of other measures.

The SWPPP shall include a description of the erosion control practices, including a time schedule, to be implemented during construction to minimize erosion on disturbed areas of a construction site. The discharger must consider the full range of erosion control BMPs. The discharger must consider any additional site-specific and seasonal conditions when selecting and implementing appropriate BMPs. The above listed erosion control measures are examples of what should be considered and are not exclusive of new or innovative approaches currently available or being developed.

- a. The SWPPP shall include:

- (1) An outline of the areas of vegetative soil cover or native vegetation onsite which will remain undisturbed during the construction project.
 - (2) An outline of all areas of soil disturbance including cut or fill areas which will be stabilized during the rainy season by temporary or permanent erosion control measures, such as seeding, mulch, or blankets, etc.
 - (3) An outline of the areas of soil disturbance, cut, or fill which will be left exposed during any part of the rainy season, representing areas of potential soil erosion where sediment control BMPs are required to be used during construction.
 - (4) A proposed schedule for the implementation of erosion control measures.
- b. The SWPPP shall include a description of the BMPs and control practices to be used for both temporary and permanent erosion control measures.
 - c. The SWPPP shall include a description of the BMPs to reduce wind erosion at all times, with particular attention paid to stock-piled materials.

7. Stabilization

- (1) All disturbed areas of the construction site must be stabilized. Final stabilization for the purposes of submitting a NOT is satisfied when:
 - All soil disturbing activities are completed AND EITHER OF THE TWO FOLLOWING CRITERIA ARE MET:
 - A uniform vegetative cover with 70 percent coverage has been established OR:
 - equivalent stabilization measures have been employed. These measures include the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.
- (2) Where background native vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: If the native vegetation covers 50 percent of the ground surface, 70 percent of 50 percent ($.70 \times .50 = .35$) would require 35 percent total uniform surface coverage.

8. Sediment Control

The SWPPP shall include a description or illustration of BMPs which will be implemented to prevent a net increase of sediment load in storm water discharge relative to preconstruction levels. Sediment control BMPs are required at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during the rainy season. Sediment control practices may include filtration devices and barriers (such as fiber rolls, silt fence, straw bale barriers, and gravel inlet filters) and/or settling devices (such as sediment traps or basins). Effective filtration devices, barriers, and settling devices shall be selected, installed and maintained properly. A proposed schedule for deployment of sediment control BMPs shall be included in the SWPPP. These are the most basic measures to prevent sediment from leaving the project site and moving into receiving waters. Limited exemptions may be authorized by the RWQCB when work on active areas precludes the use of sediment control BMPs temporarily. Under these conditions, the SWPPP must describe a plan to establish perimeter controls prior to the onset of rain.

During the nonrainy season, the discharger is responsible for ensuring that adequate sediment control materials are available to control sediment discharges at the downgrade perimeter and operational inlets in the event of a predicted storm. The discharger shall consider a full range of sediment controls, in addition to the controls listed above, such as straw bale dikes, earth dikes, brush barriers, drainage swales, check dams, subsurface drain, sandbag dikes, fiber rolls, or other controls. At a minimum, the discharger/operator must implement an effective combination of erosion and sediment control on all disturbed areas during the rainy season.

If the discharger chooses to rely on sediment basins for treatment purposes, sediment basins shall, at a minimum, be designed and maintained as follows:

Option 1: Pursuant to local ordinance for sediment basin design and maintenance, provided that the design efficiency is as protective or more protective of water quality than Option 3.

OR

Option 2: Sediment basin(s), as measured from the bottom of the basin to the principal outlet, shall have at least a capacity equivalent to 3,600 cubic feet of storage per acre draining into the sediment basin. The length of the basin shall be more than twice the width of the basin. The length is determined by measuring the distance between the inlet and the outlet; and the depth must not be less than three feet nor greater than five feet for safety reasons and for maximum efficiency.

OR

Option 3: Sediment basin(s) shall be designed using the standard equation:

$$As=1.2Q/Vs$$

Where: As is the minimum surface area for trapping soil particles of a certain size; Vs is the settling velocity of the design particle size chosen; and $Q=C \times I \times A$ where Q is the discharge rate measured in cubic feet per second; C is the runoff coefficient; I is the precipitation intensity for the 10-year, 6-hour rain event and A is the area draining into the sediment basin in acres. The design particle size shall be the smallest soil grain size determined by wet sieve analysis, or the fine silt sized (0.01mm) particle, and the Vs used shall be 100 percent of the calculated settling velocity.

The length is determined by measuring the distance between the inlet and the outlet; the length shall be more than twice the dimension as the width; the depth shall not be less than three feet nor greater than five feet for safety reasons and for maximum efficiency (two feet of storage, two feet of capacity). The basin(s) shall be located on the site where it can be maintained on a year-round basis and shall be maintained on a schedule to retain the two feet of capacity;

OR

- Option 4: The use of an equivalent surface area design or equation, provided that the design efficiency is as protective or more protective of water quality than Option 3.

A sediment basin shall have a means for dewatering within 7-calendar days following a storm event. Sediment basins may be fenced if safety (worker or public) is a concern.

The outflow from a sediment basin that discharges into a natural drainage shall be provided with outlet protection to prevent erosion and scour of the embankment and channel.

The discharger must consider any additional site-specific and seasonal conditions when selecting and designing sediment control BMPs. The above listed sediment control measures are examples of what should be considered and are not exclusive of new or innovative approaches currently available or being developed.

The SWPPP shall include a description of the BMPs to reduce the tracking of sediment onto public or private roads at all times. These public and private roads shall be inspected and cleaned as necessary. Road cleaning BMPs shall be discussed in the SWPPP and will not rely on the washing of accumulated sediment or silt into the storm drain system.

9. Non-Storm Water Management

Describe all non-storm water discharges to receiving waters that are proposed for the construction project. Non-storm water discharges should be eliminated or reduced to the extent feasible. Include the locations of such discharges and descriptions of all BMPs designed for the control of pollutants in such discharges. Onetime discharges shall be monitored during the time that such discharges are occurring. A qualified person should be assigned the responsibility for ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems (consistent with BAT/BCT), and the name and contact number of that person should be included in the SWPPP document.

Discharging sediment-laden water which will cause or contribute to an exceedance of the applicable RWQCB's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain without filtration or equivalent treatment is prohibited.

10. Post-Construction Storm Water Management

The SWPPP shall include descriptions of the BMPs to reduce pollutants in storm water discharges after all construction phases have been completed at the site (Post-Construction BMPs). Post-Construction BMPs include the minimization of land disturbance, the minimization of impervious surfaces, treatment of storm water runoff using infiltration, detention/retention, biofilter BMPs, use of efficient irrigation systems, ensuring that interior drains are not connected to a storm sewer system, and appropriately designed and constructed energy dissipation devices. These must be consistent with all local post-construction storm water management requirements, policies, and guidelines. The discharger must consider site-specific and seasonal conditions when designing the control practices. Operation and maintenance of control practices after construction is completed shall be addressed, including short-and long-term funding sources and the responsible party.

11. Maintenance, Inspection, and Repair

The SWPPP shall include a discussion of the program to inspect and maintain all BMPs as identified in the site plan or other narrative documents throughout the entire duration of the project. A qualified person will be assigned the responsibility to conduct inspections. The name and telephone number of that person shall be listed in the SWPPP document. Inspections will be performed before and after storm events and once each 24-hour period during extended storm events to identify BMP effectiveness and implement repairs or design changes as soon as feasible depending upon field conditions. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible after the conclusion of each storm depending upon worker safety.

For each inspection required above, the discharger shall complete an inspection checklist. At a minimum, an inspection checklist shall include:

- a. Inspection date.

- b. Weather information: best estimate of beginning of storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall (inches).
- c. A description of any inadequate BMPs.
- d. If it is possible to safely access during inclement weather, list observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list result of visual inspection at relevant outfall, discharge point, or downstream location and projected required maintenance activities.
- e. Corrective actions required, including any changes to SWPPP necessary and implementation dates.
- f. Inspectors name, title, and signature.

The dischargers shall prepare their inspection checklists using the inspection checklist form provided by the SWRCB or RWQCB or on forms that contain the equivalent information.

12. Training

Individuals responsible for SWPPP preparation, implementation, and permit compliance shall be appropriately trained, and the SWPPP shall document all training. This includes those personnel responsible for installation, inspection, maintenance, and repair of BMPs. Those responsible for overseeing, revising, and amending the SWPPP shall also document their training. Training should be both formal and informal, occur on an ongoing basis when it is appropriate and convenient, and should include training/workshops offered by the SWRCB, RWQCB, or other locally recognized agencies or professional organizations.

13. List of Contractors/Subcontractors

The SWPPP shall include a list of names of all contractors, (or subcontractors) and individuals responsible for implementation of the SWPPP. This list should include telephone numbers and addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers should also be included.

14. Other Plans

This SWPPP may incorporate by reference the appropriate elements of other plans required by local, State, or Federal agencies. A copy of any requirements incorporated by reference shall be kept at the construction site.

15. Public Access

The SWPPP shall be provided, upon request, to the RWQCB. The SWPPP is considered a report that shall be available to the public by the RWQCB under section 308(b) of the Clean Water Act.

16. Preparer Certification

The SWPPP and each amendment shall be signed by the landowner (discharger) or his representative and include the date of initial preparation and the date of each amendment.

SECTION B: MONITORING PROGRAM AND REPORTING REQUIREMENTS

1. Required Changes

The RWQCB may require the discharger to conduct additional site inspections, to submit reports and certifications, or perform sampling and analysis.

2. Implementation

- a. The requirements of this Section shall be implemented at the time of commencement of construction activity (see also Section A. 2. Implementation Schedule). The discharger is responsible for implementing these requirements until construction activity is complete and the site is stabilized.
- b. For ongoing construction activity involving a change in ownership of property covered by this General Permit, the new owner must complete a NOI and implement the requirements of this Section concurrent with the change of ownership. For changes of information, the owner must follow instructions in C. 7. Special Provisions for Construction Activity of the General Permit.

3. Site Inspections

Qualified personnel shall conduct inspections of the construction site prior to anticipated storm events, during extended storm events, and after actual storm events to identify areas contributing to a discharge of storm water associated with construction activity. The name(s) and contact number(s) of the assigned inspection personnel shall be listed in the SWPPP. Pre-storm inspections are to ensure that BMPs are properly installed and maintained; post-storm inspections are to assure that the BMPs have functioned adequately. During extended storm events, inspections shall be required each 24-hour period. Best Management Practices (BMPs) shall be evaluated for adequacy and proper implementation and whether additional BMPs are required in accordance with the terms of the General Permit (see language in Section A. 11. Maintenance, Inspection, and Repair). Implementation of nonstorm water discharge BMPs shall be verified and their

effectiveness evaluated. One time discharges of non-storm water shall be inspected when such discharges occur.

4. Compliance Certification

Each discharger or qualified assigned personnel listed by name and contact number in the SWPPP must certify annually that construction activities are in compliance with the requirements of this General Permit and the SWPPP. This Certification shall be based upon the site inspections required in Item 3 of this Section. The certification must be completed by July 1 of each year.

5. Noncompliance Reporting

Dischargers who cannot certify compliance, in accordance with Item 4 of this Section and/or who have had other instances of noncompliance excluding exceedances of water quality standards as defined in section B. 3. Receiving Water Limitations Language, shall notify the appropriate RWQCB within 30 days. Corrective measures should be implemented immediately following discovery that water quality standards were exceeded. The notifications shall identify the noncompliance event, including an initial assessment of any impact caused by the event; describe the actions necessary to achieve compliance; and include a time schedule subject to the modifications by the RWQCB indicating when compliance will be achieved. Noncompliance notifications must be submitted within 30-calendar days of identification of noncompliance.

6. Monitoring Records

Records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated. With the exception of noncompliance reporting, dischargers are not required to submit these records.

7. Monitoring Program for Sedimentation/Siltation

Dischargers of storm water associated with construction activity that directly enters a water body listed in Attachment 3 shall conduct a sampling and analysis program for the pollutants (sedimentation/siltation or turbidity) causing the impairment. The discharger shall monitor for the applicable parameter. If the water body is listed for sedimentation or siltation, samples should be analyzed for Settleable Solids (ml/l) and Total Suspended Solids (mg/l). Alternatively or in addition, samples may be analyzed for suspended sediment concentration according to ASTM D3977-97. If the water body is listed for turbidity, samples should be analyzed for turbidity (NTU). Discharges that flow through tributaries that are not listed in Attachment 3 or that flow into Municipal Separate Storm Sewer Systems (MS4) are not subject to these sampling and analysis requirements. The sampling and analysis parameters and procedures must be designed to determine whether the BMPs installed and maintained prevent discharges of sediment from contributing to impairment in receiving waters.

Samples shall be collected during the first two hours of discharge from rain events which result in a direct discharge to any water body listed in Attachment 3. Samples shall be collected during daylight hours (sunrise to sunset). Dischargers need not collect more than four (4) samples per month. All samples shall be taken in the receiving waters and shall be representative of the prevailing conditions of the water bodies. Samples shall be collected from safely accessible locations upstream of the construction site discharge and immediately downstream from the last point of discharge.

For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification. All field and/or laboratory analytical data shall be kept in the SWPPP document, which is to remain at the construction site at all times until a Notice of Termination has been submitted and approved.

8. Monitoring Program for Pollutants Not Visually Detectable in Storm Water

A sampling and analysis program shall be developed and conducted for pollutants which are not visually detectable in storm water discharges, which are or should be known to occur on the construction site, and which could cause or contribute to an exceedance of water quality objectives in the receiving water. Pollutants that should be considered for inclusion in this sampling and analysis program are those identified in Sections A.5.b. and A.5.c.

Construction materials and compounds that are not stored in water-tight containers under a water-tight roof or inside a building are examples of materials for which the discharger may have to implement sampling and analysis procedures. The goal of the sampling and analysis is to determine whether the BMPs employed and maintained on site are effective in preventing the potential pollutants from coming in contact with storm water and causing or contributing to an exceedance of water quality objectives in the receiving waters. Examples of construction sites that may require sampling and analysis include: sites that are known to have contaminants spilled or spread on the ground; sites where construction practices include the application of soil amendments, such as gypsum, which can increase the pH of the runoff; or sites having uncovered stockpiles of material exposed to storm water. Visual observations before, during, and after storm events may trigger the requirement to collect samples. Any breach, malfunction, leakage, or spill observed which could result in the discharge of pollutants to surface waters that *would* not be visually detectable in storm water shall trigger the collection of a sample of discharge. Samples shall be collected at all discharge locations which drain the areas identified by the visual observations and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples. A sufficiently large sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site

(uncontaminated sample) shall be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

The uncontaminated sample shall be compared to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and TDS.

For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification. All field and/or analytical data shall be kept in the SWPPP document, which is to remain at the construction site at all times until a *Notice of Termination* has been submitted and approved.

SECTION C: STANDARD PROVISIONS FOR CONSTRUCTION ACTIVITY

1. Duty to Comply

The discharger must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

2. General Permit Actions

This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

4. Duty to Mitigate

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit and with the requirements of Storm Water Pollution Prevention Plans (SWPPP). Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

6. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

7. Duty to Provide Information

The discharger shall furnish the RWQCB, State Water Resources Control Board, or USEPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records required to be kept by this General Permit.

8. Inspection and Entry

The discharger shall allow the RWQCB, SWRCB, USEPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;
- b. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;
- c. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and
- d. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

9. Signatory Requirements

- a. All Notice of Intents (NOIs), Notice of Terminations (NOTs), SWPPPs, certifications, and reports prepared in accordance with this Order submitted to the SWRCB shall be signed as follows:
 - (1) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or (b) the manager of the construction activity if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
 - (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - (3) For a municipality, State, Federal, or other public agency: by either a principal executive officer, ranking elected official, or duly authorized representative. The principal executive officer of a Federal agency includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of USEPA).
- b. All SWPPPs, reports, certifications, or other information required by the General Permit and/or requested by the RWQCB, SWRCB, USEPA, or the local storm water management agency shall be signed by a person described above or by a duly authorized representative. A person is a duly authorized representative if:
 - (1) The authorization is made in writing by a person described above and retained as part of the SWPPP; or

- (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the construction activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).
- c. If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization must be attached to the SWPPP prior to submittal of any reports, information, or certifications to be signed by the authorized representative.

10. Certification

Any person signing documents under Section C, Provision 9 above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. Anticipated Noncompliance

The discharger will give advance notice to the RWQCB and local storm water management agency of any planned changes in the construction activity which may result in noncompliance with General Permit requirements.

12. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

13. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

14. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

15. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

16. Penalties for Violations of Permit Conditions

- a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$27,500 per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.
- b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties which in some cases are greater than those under the CWA.

17. Availability

A copy of this General Permit shall be maintained at the construction site during construction activity and be available to operating personnel.

18. Transfers

This General Permit is not transferable. A new owner of an ongoing construction activity must submit a NOI in accordance with the requirements of this General Permit to be authorized to discharge under this General Permit. An owner who sells property covered

by this General Permit shall inform the new owner of the duty to file a NOI and shall provide the new owner with a copy of this General Permit.

19. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

SWRCB AND RWQCB CONTACT LIST

Division of Water Quality

P.O. Box 1977

Sacramento, CA 95812-1977

(916) 341-5537 FAX: (916) 341-5543

Web Page: <http://www.waterboards.ca.gov/stormwtr/index.html>

Email: stormwater@waterboards.ca.gov

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

NORTH COAST REGION (1)

5550 Skylane Blvd, Ste. A

Santa Rose, CA 95403

(707) 576-2220 FAX: (707) 523-0135

<http://www.waterboards.ca.gov/rwqcb1>

SAN FRANCISCO BAY REGION (2)

1515 Clay Street, Ste. 1400

Oakland, CA 94612

(510) 622-2300 FAX: (510) 622-2640

<http://www.waterboards.ca.gov/rwqcb2>

CENTRAL COAST REGION (3)

895 Aerovista Place, Ste 101

San Luis Obispo, CA 93401

(805) 549-3147 FAX: (805) 543-0397

<http://www.waterboards.ca.gov/rwqcb3>

LOS ANGELES REGION (4)

320 W. 4th Street, Ste. 200

Los Angeles, CA 90013

(213) 576-6600 FAX: (213) 576-6640

<http://www.waterboards.ca.gov/rwqcb4>

CENTRAL VALLEY REGION (5S)

11020 Sun Center Dr., #200

Rancho Cordova, CA 95670-6114

(916) 464-3291 FAX: (916) 464-4645

<http://www.waterboards.ca.gov/rwqcb5>

FRESNO BRANCH OFFICE (5F)

1685 E St.

Fresno, CA 93706

(559) 445-5116 FAX: (559) 445-5910

<http://www.waterboards.ca.gov/rwqcb5>

REDDING BRANCH OFFICE (5R)

415 Knollcrest Drive, Ste. 100

Redding, CA 96002

(530) 224-4845 FAX: (530) 224-4857

<http://www.waterboards.ca.gov/rwqcb5>

LAHONTAN REGION (6 SLT)

2501 Lake Tahoe Blvd.

South Lake Tahoe, CA 96150

(530) 542-5400 FAX: (530) 544-2271

<http://www.waterboards.ca.gov/rwqcb6>

VICTORVILLE OFFICE (6V)

15428 Civic Drive, Ste. 100

Victorville, CA 92392-2383

(760) 241-6583 FAX: (760) 241-7308

<http://www.waterboards.ca.gov/rwqcb6>

COLORADO RIVER BASIN REGION (7)

73-720 Fred Waring Dr., Ste. 100

Palm Desert, CA 92260

(760) 346-7491 FAX: (760) 341-6820

<http://www.waterboards.ca.gov/rwqcb7>

SANTA ANA REGION (8)

California Tower

3737 Main Street, Ste. 500

Riverside, CA 92501-3339

<http://www.waterboards.ca.gov/rwqcb8>

SAN DIEGO REGION (9)

9174 Sky Park Court, Ste. 100

San Diego, CA 92123-4340

(858) 467-2952 FAX: (858) 571-6972

<http://www.waterboards.ca.gov/rwqcb9>

STATE OF CALIFORNIA

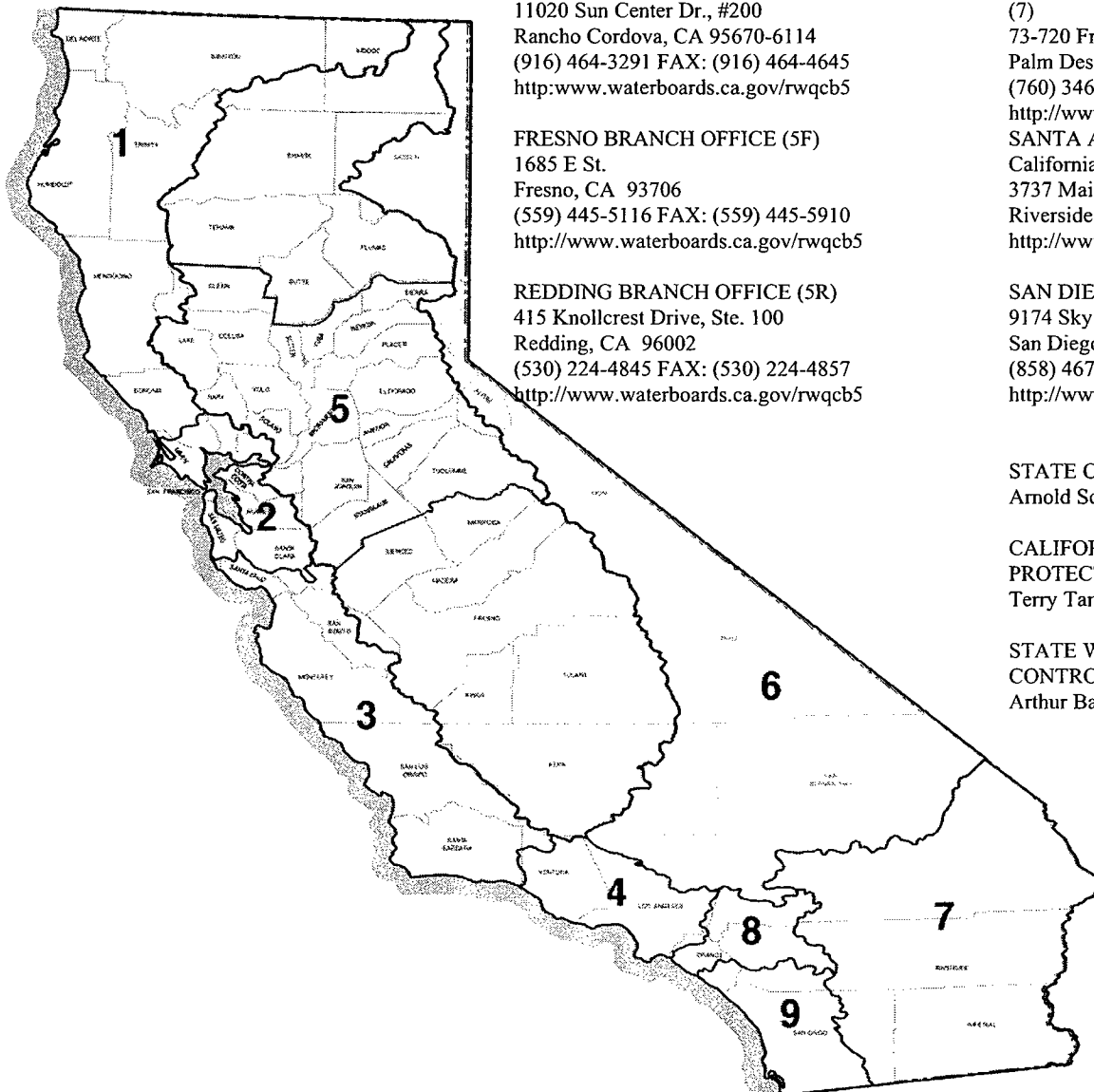
Arnold Schwarzenegger, Governor

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

Terry Tamminen, Secretary

STATE WATER RESOURCES CONTROL BOARD

Arthur Baggett Jr., Chairman



NOTICE OF INTENT (NOI) TO COMPLY WITH THE TERMS
OF THE GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL INSTRUCTIONS

Who Must Submit

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Activities Storm Water Permit (General Permit). Construction activity which is a part of a larger common area of development or sale must also be permitted. (For example, if 4 acres of a 20-acre subdivision is disturbed by construction activities, and the remaining 16 acres is to be developed at a future date, the property owner must obtain a General Storm Water Permit for the 4-acre project). Construction activity includes, but is not limited to: clearing, grading, demolition, excavation, construction of new structures, and reconstruction of existing facilities involving removal and replacement that results in soil disturbance. This includes construction access roads, staging areas, storage areas, stockpiles, and any off-site areas which receive run-off from the construction project such as discharge points into a receiving water. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

The owner of the land where the construction activity is occurring is responsible for obtaining a permit. Owners may obtain coverage under the General Permit by filing a NOI in accordance with the following instructions. Coverage for construction activity conducted on easements (e.g., pipeline construction) or on nearby properties by agreement or permission, or by an owner or lessee of a mineral estate (oil, gas, geothermal, aggregate, precious metals, and/or industrial minerals) entitled to conduct the activities, shall be obtained by the entity responsible for the construction activity. Linear construction projects which will have construction activity occurring in one or more than one Region should contact the State Water Resources Control Board at the number listed below prior to submitting an NOI application for specific information related to the use of the NOI form.

Construction Activity Not Covered By This General Permit

Storm water discharges in the Lake Tahoe Hydrologic Unit will be regulated by a separate permit(s) adopted by the California Regional Water Quality Control Board, Lahontan Region, and will not be covered under the State Water Resources Control Board's (SWRCB) General Permit. Storm water discharges on Indian Lands will be regulated by the U.S. Environmental Protection Agency.

Where to Apply

The NOI form, vicinity map, and appropriate fee must be mailed to the SWRCB at the following address:

State Water Resources Control Board
Division of Water Quality
Attn: Storm Water Permit Unit
P.O. Box 1977
Sacramento, CA 95812-1977

When to Apply

Property owners proposing to conduct construction activities subject to this General Permit must file a Notice of Intent prior to the commencement of construction activity.

Fees

The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI. Checks should be made payable to: SWRCB.

Completing the Notice of Intent (NOI)

The submittal to obtain coverage under the General Permit must include a completed NOI Form (Notice of Intent, attached), a vicinity map, and the appropriate annual fee. The NOI must be completely and accurately filled out; the vicinity map and annual fee must be included with the NOI or the submittal is considered incomplete and will be rejected. A construction site is considered to be covered by the General Permit upon filing a complete NOI submittal, and implementation of a defensible Storm Water Pollution Prevention Plan (SWPPP). Upon receipt of a complete NOI submittal, each discharger will be sent a receipt letter containing the waste discharger's identification (WDID) number.

Questions?

If you have any questions on completing the NOI please call the SWRCB at (916) 341-5537.

NOI-LINE-BY-LINE INSTRUCTIONS

Please type or print when completing the NOI Form and vicinity map.

SECTION I--NOI STATUS

Mark one of the two boxes at the top portion of the NOI. Check box 1 if the NOI is being completed for new construction. Check box 2 if the NOI is being submitted to report changes for a construction site already covered by the General Permit. An example of a change that warrants a resubmittal of the NOI is a change of total area of the construction site. The permit is non-transferable, a change of ownership requires a Notice of Termination (NOT) submittal and a new NOI. Complete only those portions of the NOI that apply to the changes (the NOI must always be signed). If box 2 is checked, the WDID number must be included.

SECTION II--PROPERTY OWNER

Enter the construction site owner's official or legal name and address; contact person (if other than owner), title, and telephone number.

SECTION III--DEVELOPER / CONTRACTOR INFORMATION

Enter the name of the developer's (or general contractor's) official or legal name, address, contact person, title, and telephone number. The contact person should be someone who is familiar with the construction site and is responsible for compliance and oversight of the general permit.

SECTION IV--CONSTRUCTION PROJECT INFORMATION

Enter the project name, site address, county, city, (or nearest city if construction is occurring in an unincorporated area), zip code, and telephone number (if any) of the construction site. Include an emergency contact telephone or pager number. Construction site information should include latitude and longitude designations, tract numbers, and/or mile post markers, if applicable. The site contact person should be someone who is familiar with the project, site plans, SWPPP, and monitoring program. All NOIs must be accompanied by a vicinity map.

Part A: Enter the total size in acres of all areas associated with construction activity, including all access roads.

Part B: Enter the total size in acres of the area to be disturbed by construction activity and the percentage of the area listed in Part A above that this represents.

Part C: Enter the percentage of the site that is impervious (areas where water cannot soak into the ground, such as concrete, asphalt, rooftops, etc.) before and after construction.

Part D: Include tract numbers, if available.

- Part E: Enter the mile post marker number at the project site location.
- Part F: Indicate whether the construction site is part of a larger common plan of development or sale. For example, if the construction activity is occurring on a two-acre site which is within a development that is one acre or greater, answer yes.
- Part G: Enter the name of the development (e.g. "Quail Ridge Subdivision", "Orange Valley Estates", etc.).
- Part H: Indicate when construction will begin (month, day, year). When a NOI is being submitted due to a change in ownership, the commencement date should be the date the new ownership took effect.
- Part I: Indicate the percentage of the total project area to be mass graded.
- Part J: Enter the estimated completion dates for the mass grading activities and for the project completion.
- Part K: Indicate the type(s) of construction taking place. For example, "Transportation" should be checked for the construction of roads; "Utility" should be checked for installation of sewer, electric, or telephone systems. Include a description of the major construction activities, (e.g., 20 single family homes, a supermarket, an office building, a factory, etc.)

SECTION V--BILLING ADDRESS

To continue coverage under the General Permit, the annual fee must be paid. Indicate where the annual fee invoice should be mailed by checking one of the following boxes:

Owner: sent to the owners address as it appears in Section II.

Developer/Contractor: sent to the developer's address as it appears in Section III.

Other: sent to a different address and enter that address in the spaces provided.

SECTION VI--REGULATORY STATUS

Indicate whether or not the site is subject to local erosion/sediment control ordinances. Indicate whether the erosion/sediment control plan designed to comply with the ordinance addresses the construction of infrastructure and structures in addition to grading. Identify the name and telephone number of the local agency, if applicable.

SECTION VII--RECEIVING WATER INFORMATION

Part A: Indicate whether the storm water runoff from the construction site discharges indirectly to waters of the United States, directly to waters of the United States, or to a separate storm drain system.

Indirect discharges include discharges that may flow overland across adjacent properties or rights-of-way prior to discharging into waters of the United States.

Enter the name of the owner/operator of the relevant storm drain system, if applicable. Storm water discharges directly to waters of the United States will typically have an outfall structure directly from the facility to a river, lake, creek, stream, bay, ocean, etc. Discharges to separate storm sewer systems are those that discharge to a collection system operated by municipalities, flood control districts, utilities, or similar entities.

Part B: Enter the name of the receiving water. Regardless of point of discharge, the owner must determine the receiving water for the construction site's storm water discharge. Enter the name of the receiving water.

SECTION VIII--IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

Part A: Indicate the status of the SWPPP, date prepared, or availability for review. Also indicate if a tentative construction schedule has been included in the SWPPP (the inclusion of a construction activity schedule is a mandatory SWPPP requirement).

Part B: Provide information concerning the status of the development of a monitoring program, a component of the SWPPP which outlines an inspection and maintenance schedule for the proposed Best Management Practices (BMPs). Provide name and phone number of program preparer.

Part C: Provide the name and phone numbers of the responsible party or parties designated to insure compliance with all elements of the General Permit and SWPPP.

SECTION IX--VICINITY MAP AND FEE

Provide a "to scale" or "to approximate scale" drawing of the construction site and the immediate surrounding area. Whenever possible, limit the map to an 8.5" x 11" or 11" x 17" sheet of paper. At a minimum, the map must show the site perimeter, the geographic features surrounding the site, and general topography, and a north arrow. The map must also include the location of the construction project in relation to named streets, roads, intersections, or landmarks. A NOI containing a map which does not clearly indicate the location of the construction project will be rejected. Do not submit blueprints unless they meet the above referenced size limits.

SECTION X--CERTIFICATIONS

This section must be completed by the owner or signatory agent of the construction site*. The certification provides assurances that the NOI and vicinity map were completed in an accurate and complete fashion and with the knowledge that penalties exist for providing false information. Certification also requires the owner to comply with the provisions in the General Permit.

* For a corporation: a responsible corporate officer (or authorized individual). For a partnership or sole proprietorship: a general partner or the proprietor, respectively. For a municipality, State, Federal, or other public agency: either a principal executive officer, ranking elected official, or duly authorized representative.



State Water Resources Control Board
NOTICE OF INTENT
TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ ORDER No. 99-08-DWQ)

I. NOI STATUS (SEE INSTRUCTIONS)

MARK ONLY ONE ITEM	1. <input type="checkbox"/> New Construction	2. <input type="checkbox"/> Change of Information for WDID#
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II. PROPERTY OWNER

Name		Contact Person	
Mailing Address		Title	
City	State	Zip	Phone
Owner Type (check one) 1. <input type="checkbox"/> Private Individual 2. <input type="checkbox"/> Business 3. <input type="checkbox"/> Municipal 4. <input type="checkbox"/> State 5. <input type="checkbox"/> Federal 6. <input type="checkbox"/> Other			

III. DEVELOPER/CONTRACTOR INFORMATION

Developer/Contractor		Contact Person	
Mailing Address		Title	
City	State	Zip	Phone

IV. CONSTRUCTION PROJECT INFORMATION

Site/Project Name		Site Contact Person	
Physical Address/Location		Latitude _____°	Longitude _____°
City (or nearest City)		Zip	County
		Site Phone Number	Emergency Phone Number
A. Total size of construction site area: _____ Acres	C. Percent of site imperviousness (including rooftops): Before Construction: _____% After Construction: _____%		D. Tract Number(s): _____
B. Total area to be disturbed: _____ Acres (% of total _____)			E. Mile Post Marker: _____
F. Is the construction site part of a larger common plan of development or sale? <input type="checkbox"/> YES <input type="checkbox"/> NO		G. Name of plan or development:	
H. Construction commencement date: ____/____/____		J. Projected construction dates: Complete grading: ____/____/____ Complete project: ____/____/____	
I. % of site to be mass graded: _____			
K. Type of Construction (Check all that apply): 1. <input type="checkbox"/> Residential 2. <input type="checkbox"/> Commercial 3. <input type="checkbox"/> Industrial 4. <input type="checkbox"/> Reconstruction 5. <input type="checkbox"/> Transportation 6. <input type="checkbox"/> Utility Description: _____ 7. <input type="checkbox"/> Other (Please List): _____			

V. BILLING INFORMATION

SEND BILL TO: <input type="checkbox"/> OWNER (as in II. above)	Name	Contact Person
<input type="checkbox"/> DEVELOPER (as in III. above)	Mailing Address	Phone/Fax
<input type="checkbox"/> OTHER (enter information at right)	City	State Zip

VI. REGULATORY STATUS

A. Has a local agency approved a required erosion/sediment control plan?.....	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Does the erosion/sediment control plan address construction activities such as infrastructure and structures?.....	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Name of local agency: _____	Phone: _____	
B. Is this project or any part thereof, subject to conditions imposed under a CWA Section 404 permit of 401 Water Quality Certification?.....	<input type="checkbox"/> YES	<input type="checkbox"/> No
If yes, provide details: _____		

VII. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):	
1. <input type="checkbox"/>	Indirectly to waters of the U.S.
2. <input type="checkbox"/>	Storm drain system - Enter owner's name: _____
3. <input type="checkbox"/>	Directly to waters of U.S. (e.g. , river, lake, creek, stream, bay, ocean, etc.)
B. Name of receiving water: (river, lake, creek, stream, bay, ocean): _____	

VIII. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (check one)	
<input type="checkbox"/>	A SWPPP has been prepared for this facility and is available for review: Date Prepared: ____/____/____ Date Amended: ____/____/____
<input type="checkbox"/>	A SWPPP will be prepared and ready for review by (enter date): ____/____/____
<input type="checkbox"/>	A tentative schedule has been included in the SWPPP for activities such as grading, street construction, home construction, etc.
B. MONITORING PROGRAM	
<input type="checkbox"/>	A monitoring and maintenance schedule has been developed that includes inspection of the construction BMPs before anticipated storm events and after actual storm events and is available for review.
If checked above: A qualified person has been assigned responsibility for pre-storm and post-storm BMP inspections to identify effectiveness and necessary repairs or design changes..... <input type="checkbox"/> YES <input type="checkbox"/> NO	
Name: _____ Phone: _____	
C. PERMIT COMPLIANCE RESPONSIBILITY	
A qualified person has been assigned responsibility to ensure full compliance with the Permit, and to implement all elements of the Storm Water Pollution Prevention Plan including:	
1. Preparing an annual compliance evaluation.....	<input type="checkbox"/> YES <input type="checkbox"/> NO
Name: _____ Phone: _____	
2. Eliminating all unauthorized discharges.....	<input type="checkbox"/> YES <input type="checkbox"/> NO

IX. VICINITY MAP AND FEE (must show site location in relation to nearest named streets, intersections, etc.)

Have you included a vicinity map with this submittal?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Have you included payment of the annual fee with this submittal?.....	<input type="checkbox"/> YES	<input type="checkbox"/> NO

X. CERTIFICATIONS

<p>"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that I have read the entire General Permit, including all attachments, and agree to comply with and be bound by all of the provisions, requirements, and prohibitions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan will be complied with."</p>	
Printed Name: _____	
Signature: _____	Date: _____
Title: _____	

ATTACHMENT 3

303d Listed Water Bodies for Sedimentation

REGION	WATER BODY NAME	CODE	POLLUTANT
1	MATTOLE RIVER	1100	Sedimentation/Siltation
1	TRINITY RIVER, SOUTH FORK	1100	Sedimentation/Siltation
1	REDWOOD CREEK	1100	Sedimentation/Siltation
1	MAD RIVER	1100	Sedimentation/Siltation
1	ELK RIVER	1100	Sedimentation/Siltation
1	EEL RIVER, SOUTH FORK	1100	Sedimentation/Siltation
1	EEL RIVER, NORTH FORK	1100	Sedimentation/Siltation
1	TRINITY RIVER	1100	Sedimentation/Siltation
1	EEL RIVER, MIDDLE FORK	1100	Sedimentation/Siltation
1	MAD RIVER	2500	Turbidity
1	TEN MILE RIVER	1100	Sedimentation/Siltation
1	NOYO RIVER	1100	Sedimentation/Siltation
1	BIG RIVER	1100	Sedimentation/Siltation
1	ALBION RIVER	1100	Sedimentation/Siltation
1	NAVARRO RIVER	1100	Sedimentation/Siltation
1	GARCIA RIVER	1100	Sedimentation/Siltation
1	GUALALA RIVER	1100	Sedimentation/Siltation
1	RUSSIAN RIVER	1100	Sedimentation/Siltation
1	TOMKI CREEK	1100	Sedimentation/Siltation
1	VAN DUZEN RIVER	1100	Sedimentation/Siltation
1	EEL RIVER DELTA	1100	Sedimentation/Siltation
1	EEL RIVER, MIDDLE MAIN FORK	1100	Sedimentation/Siltation
1	ESTERO AMERICANO	1100	Sedimentation/Siltation
1	NAVARRO RIVER DELTA	1100	Sedimentation/Siltation
1	EEL RIVER, UPPER MAIN FORK	1100	Sedimentation/Siltation
1	FRESHWATER CREEK	1100	Sedimentation/Siltation
1	SCOTT RIVER	1100	Sedimentation/Siltation
2	TOMALES BAY	1100	Sedimentation/Siltation
2	NAPA RIVER	1100	Sedimentation/Siltation
2	SONOMA CREEK	1100	Sedimentation/Siltation
2	PETALUMA RIVER	1100	Sedimentation/Siltation
2	LAGUNITAS CREEK	1100	Sedimentation/Siltation
2	WALKER CREEK	1100	Sedimentation/Siltation
2	SAN GREGORIO CREEK	1100	Sedimentation/Siltation

2	SAN FRANCISQUITO CREEK	1100	Sedimentation/Siltation
2	PESCADERO CREEK (REG 2)	1100	Sedimentation/Siltation
2	BUTANO CREEK	1100	Sedimentation/Siltation
3	MORRO BAY	1100	Sedimentation/Siltation
3	SAN LORENZO RIVER ESTUARY	1100	Sedimentation/Siltation
3	SHINGLE MILL CREEK	1100	Sedimentation/Siltation
3	MOSS LANDING HARBOR	1100	Sedimentation/Siltation
3	WATSONVILLE SLOUGH	1100	Sedimentation/Siltation
3	SAN LORENZO RIVER	1100	Sedimentation/Siltation
3	ELKHORN SLOUGH	1100	Sedimentation/Siltation
3	SALINAS RIVER LAGOON (NORTH)	1100	Sedimentation/Siltation
3	GOLETA SLOUGH/ESTUARY	1100	Sedimentation/Siltation
3	CARPINTERIA MARSH (EL ESTERO MARSH)	1100	Sedimentation/Siltation
3	LOMPICO CREEK	1100	Sedimentation/Siltation
3	MORO COJO SLOUGH	1100	Sedimentation/Siltation
3	VALENCIA CREEK	1100	Sedimentation/Siltation
3	PAJARO RIVER	1100	Sedimentation/Siltation
3	RIDER GULCH CREEK	1100	Sedimentation/Siltation
3	LLAGAS CREEK	1100	Sedimentation/Siltation
3	SAN BENITO RIVER	1100	Sedimentation/Siltation
3	SALINAS RIVER	1100	Sedimentation/Siltation
3	CHORRO CREEK	1100	Sedimentation/Siltation
3	LOS OSOS CREEK	1100	Sedimentation/Siltation
3	SANTA YNEZ RIVER	1100	Sedimentation/Siltation
3	SAN ANTONIO CREEK (SANTA BARBARA COUNTY)	1100	Sedimentation/Siltation
3	CARBONERA CREEK	1100	Sedimentation/Siltation
3	SOQUEL LAGOON	1100	Sedimentation/Siltation
3	APTOS CREEK	1100	Sedimentation/Siltation
4	MUGU LAGOON	1100	Sedimentation/Siltation
5	HUMBUG CREEK	1100	Sedimentation/Siltation
5	PANOCH CREEK	1100	Sedimentation/Siltation
5	FALL RIVER (PIT)	1100	Sedimentation/Siltation
6	BEAR CREEK (R6)	1100	Sedimentation/Siltation
6	MILL CREEK (3)	1100	Sedimentation/Siltation
6	HORSESHOE LAKE (2)	1100	Sedimentation/Siltation
6	BRIDGEPORT RES	1100	Sedimentation/Siltation
6	TOPAZ LAKE	1100	Sedimentation/Siltation
6	LAKE TAHOE	1100	Sedimentation/Siltation

6	PINE CREEK (2)	1100	Sedimentation/Siltation
6	TRUCKEE RIVER	1100	Sedimentation/Siltation
6	CLEARWATER CREEK	1100	Sedimentation/Siltation
6	GRAY CREEK (R6)	1100	Sedimentation/Siltation
6	WARD CREEK	1100	Sedimentation/Siltation
6	BLACKWOOD CREEK	1100	Sedimentation/Siltation
6	GOODALE CREEK	1100	Sedimentation/Siltation
6	EAST WALKER RIVER	1100	Sedimentation/Siltation
6	HEAVENLY VALLEY CREEK	1100	Sedimentation/Siltation
6	WOLF CREEK (1)	1100	Sedimentation/Siltation
6	WEST WALKER RIVER	1100	Sedimentation/Siltation
6	HOT SPRINGS CANYON CREEK	1100	Sedimentation/Siltation
6	BRONCO CREEK	1100	Sedimentation/Siltation
6	SQUAW CREEK	1100	Sedimentation/Siltation
7	IMPERIAL VALLEY DRAINS	1100	Sedimentation/Siltation
7	NEW RIVER (R7)	1100	Sedimentation/Siltation
7	ALAMO RIVER	1100	Sedimentation/Siltation
8	SAN DIEGO CREEK, REACH 1	1100	Sedimentation/Siltation
8	RATHBONE (RATHBUN) CREEK	1100	Sedimentation/Siltation
8	SAN DIEGO CREEK, REACH 2	1100	Sedimentation/Siltation
8	UPPER NEWPORT BAY ECOLOGICAL RESERVE	1100	Sedimentation/Siltation
8	BIG BEAR LAKE	1100	Sedimentation/Siltation
8	ELSINORE, LAKE	1100	Sedimentation/Siltation
9	SAN ELIJO LAGOON	1100	Sedimentation/Siltation
9	LOS PENASQUITOS LAGOON	1100	Sedimentation/Siltation
9	AGUA HEDIONDA LAGOON	1100	Sedimentation/Siltation
9	BUENA VISTA LAGOON	1100	Sedimentation/Siltation

**NEW OWNER INFORMATION AND
CHANGE OF INFORMATION (COD) FORM FOR THE
GENERAL CONSTRUCTION PERMIT NO. CAS000002**

Owners Name: _____

Date: _____

WDID No.: _____

Date of Last NOI Change: _____

Prepared By: _____

Signature of Preparer: _____

	Area Transferred (acres) ¹ column 1	Area Remaining (acres) ² column 2	Lot/Tract Numbers Transferred	Contact Person and Company Name of NewOwner(s)	Address(es) of the New Owner(s)	Phone # of New Owner	Is Const/Post Construction Complete? Yes/No	Date of Ownership Transfer
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

¹Use approximate area (in acres) if no exact figure is available.²Calculate running total in this column as follows:

Enter in column 2, line 1, the area from NOI minus the area in column 1.

Enter in column 2, line 2, the area in column 2, line 1, minus the area in line 2, column 1.

Enter in column 2, line 3, the area in column 2, line 2, minus the area in line 3, column 1, and so forth.