

## **Section 4 Attachments**

**Attachment 4.1: Updated Local SUSMP – Updated 06-30-10**

**Attachment 4.2: CEQA Initial Study-Environmental Checklist Form  
for Hydrology and Water Quality**

**Attachment 4.3: Treatment Control BMP Inventory**

**Attachment 4.4: Self Verification Documents – Updated 06-30-10**

**Attachment 4.1 – County of San Diego SUSMP**  
Updated June 30, 2010

# COUNTY OF SAN DIEGO SUSMP

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## *Standard Urban Stormwater Mitigation Plan Requirements for Development Applications*

March 25, 2010

Visit <http://www.sdcounty.ca.gov/dpw/watersheds/susmp/susmp.html> for updates.

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## SUMMARY

In January 2007, the California Regional Water Quality Control Board for the San Diego Region (Regional Water Board) reissued a municipal stormwater NPDES permit to San Diego area municipal Copermittees. The reissued permit updates and expands stormwater requirements for new developments and redevelopments. Stormwater treatment requirements have been made more widely applicable and more stringent; minimum standards for Low Impact Development (LID) have been added, and the Copermittees are required to develop and implement criteria for the control of runoff peaks and durations from development sites.

Low Impact Development is an integrated site design methodology that uses small-scale detention and retention to minimize pollutants conveyed by runoff and to mimic pre-project site hydrological conditions.

As required by the reissued permit, the Copermittees have prepared an updated Countywide Model SUSMP to replace the current countywide model SUSMP, which has been in effect since 2002. This SUSMP is consistent with the Model SUSMP and serves as the County's SUSMP. Applicable SUSMP requirements are incorporated into Priority Project plan(s) as part of the development plan approval process for discretionary projects. Similar requirements are incorporated into County CIP construction projects. To assist the land development community, to streamline project reviews, and to maximize cost-effective environmental benefits, this SUSMP incorporates a unified LID design procedure. This design procedure integrates site planning and design measures with engineered, small-scale Integrated Management Practices (IMPs) such as bioretention. By following the procedure, applicants can develop a single integrated design which complies with the complex and overlapping NPDES permit LID requirements, stormwater treatment requirements, and runoff peak-and-duration-control (hydromodification management) requirements.

Along with the detailed design procedure, this SUSMP includes design information and criteria for dispersal of runoff to landscaped areas and for pervious pavements, bioretention facilities, flow-through planters, dry wells, infiltration basins, and cisterns. Where feasible and where allowed, water in cisterns may be directed to nonpotable uses, augmenting water supplies. Bioretention facilities and planter boxes can be designed with an impermeable barrier so that runoff does not saturate native soils; instead, runoff is filtered through an engineered soil mix before being captured in an underdrain and conveyed to off-site storm drains. This configuration may be needed where groundwater is high, is contaminated, or where increasing soil moisture may present a hazard to foundations or slope stability.

Applicants for development project approvals may choose not to use the unified LID design procedure; however, they will still need to demonstrate compliance with the applicable LID criteria, stormwater treatment criteria, and hydromodification management criteria. This SUSMP requires that runoff be infiltrated or else treated by bioretention facilities, planter boxes, filters, settling ponds, or constructed wetlands. In some special circumstances—

retrofit of existing drainage systems, some pedestrian-oriented developments, and roadway widening projects—where it can also be demonstrated it is not feasible to construct any of these facilities, higher-rate surface biofilters or higher-rate vault based filtration units may be used.

Applicants for approval of Priority Development Projects must demonstrate compliance with the hydromodification management criteria in the NPDES permit. This SUSMP includes guidance for demonstrating compliance. Submittals for projects smaller than 50 acres may demonstrate compliance by using the integrated LID design procedure. For larger projects, the applicant may use a continuous simulation hydrologic computer model to simulate pre-project and post-project runoff, including the effect of LID facilities, detention basins, or other stormwater management facilities, or may identify an exemption applicable to the site.

Applicants must also incorporate into their project design features to control pollutants from specified on-site sources, such as refuse areas, outdoor storage areas, and vehicle washing and repair facilities. A table has been included in this SUSMP listing the types of sources to be controlled and for each, the corresponding source control measures required.

This SUSMP provides the applicant with step-by-step instructions for preparing a Project Submittal for review by the municipal staff. The recommended steps are:

1. Assemble needed information.
2. Identify site opportunities and constraints.
3. Follow the LID Design Guidance to analyze the project for LID and to develop and document the drainage design.
4. Specify source controls using the sources/source control checklist in the appendix E.
5. Plan for ongoing maintenance of treatment and flow-control facilities.
6. Complete the Project Submittal.

The step-by-step instructions are augmented by an example checklist which municipal staff may use as a guide when reviewing the Project Submittal. These steps should be documented in the required project Storm Water Management Plan (SWMP).

As required by the reissued NPDES permit, the County implements a program to verify that approved stormwater treatment facilities are operating effectively. To facilitate implementation of these programs, this SUSMP includes instructions for applicants to prepare detailed maintenance plans.

This SUSMP is available for download in .PDF format at <http://www.sdcounty.ca.gov/dpw/watersheds/susmp/susmp.html>.

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# Glossary

Best Management Practice (BMP)	Any procedure or device designed to minimize the quantity of pollutants that enter the storm drain system.
California Association of Stormwater Quality Agencies (CASQA)	Publisher of the California Stormwater Best Management Practices Handbooks, available at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> . Successor to the Storm Water Quality Task Force (SWQTF).
California BMP Method	A method for determining the required volume of stormwater treatment facilities. Described in Section 5.5.1 of the California Stormwater Best Management Practice Manual (New Development) (CASQA, 2003).
Conditions of Approval (COAs)	Requirements a municipality may adopt for a project in connection with a discretionary action (e.g., adoption of an EIR or negative declaration or issuance of a use permit). COAs may include features to be incorporated into the final plans for the project and may also specify uses, activities, and operational measures that must be observed over the life of the project.
Continuous Simulation Modeling	A method of hydrological analysis in which a set of rainfall data (typically hourly for 30 years or more) is used as input, and runoff rates are calculated on the same time step. The output is then analyzed statistically for the purposes of comparing runoff patterns under different conditions (for example, pre- and post-development-project).
Copermittees	See Dischargers.
Detention	The practice of holding stormwater runoff in ponds, vaults, within berms, or in depressed areas and letting it discharge slowly to the storm drain system. See definitions of infiltration and retention.
Directly Connected Impervious Area	Any impervious surface which drains into a catch basin, area drain, or other conveyance structure without first allowing flow across pervious areas (e.g. lawns).
Direct Infiltration	Infiltration via methods or devices, such as dry wells or infiltration trenches, designed to bypass unsaturated surface soils and transmit runoff directly to groundwater.
Dischargers	The agencies named in the stormwater NPDES permit (see definition): the County of San Diego; the Cities of Carlsbad, El Cajon, La Mesa, Poway, Solana Beach, Chula Vista, Encinitas, Lemon Grove, San Diego, Vista, Coronado, Escondido, National City, San Marcos, Del Mar, Imperial Beach, Oceanside, and Santee; the San Diego Unified Port District, and the San Diego County Regional Airport Authority.
Drainage Management Areas	Areas delineated on a map of the development site showing how drainage is detained, dispersed, or directed to Integrated Management Practices. There are four types of Drainage Management Areas, and specific criteria apply to each type of area. See Chapter 4.

Drawdown time	The time required for a stormwater detention or infiltration facility to drain and return to the dry-weather condition. For detention facilities, drawdown time is a function of basin volume and outlet orifice size. For infiltration facilities, drawdown time is a function of basin volume and infiltration rate.
Environmentally Sensitive Areas	Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the County.
Flow Control	Control of runoff rates and durations as required by the Hydromodification Management Plan.
Head	In hydraulics, energy represented as a difference in elevation. In slow-flowing open systems, the difference in water surface elevation, e.g., between an inlet and outlet.
Higher-Rate Biofilter	A biofilter with a design surface loading rate higher than the 5 inches per hour rate specified in this document for bioretention facilities and planter boxes.
Hydrograph	Runoff flow rate plotted as a function of time.
Hydromodification Management Plan (HMP)	A Plan implemented by the dischargers so that post-project runoff shall not exceed estimated pre-project rates and/or durations, where increased runoff would result in increased potential for erosion or other adverse impacts to beneficial uses. Also see definition for flow control.
Hydrologic Soil Group	Classification of soils by the Natural Resources Conservation Service (NRCS) into A, B, C, and D groups according to infiltration capacity.
Impervious surface	Any material that prevents or substantially reduces infiltration of water into the soil. See discussion of imperviousness in Chapter Two.
Infeasible	As applied to best management practices, impossible to implement because of technical constraints specific to the site.
Infiltration	Seepage of runoff into soils underlying the site. See definition of retention.
Infiltration Device	Any structure, such as a dry well, that is designed to infiltrate stormwater into the subsurface and, as designed, bypasses the natural groundwater protection afforded by surface or near-surface soil. See definition for direct infiltration.
Integrated Management Practice (IMP)	A facility (BMP) that provides small-scale treatment, retention, and/or detention and is integrated into site layout, landscaping and drainage design. See Low Impact Development.

Integrated Pest Management (IPM)	An approach to pest management that relies on information about the life cycles of pests and their interaction with the environment. Pest control methods are applied with the most economical means and with the least possible hazard to people, property, and the environment.
Interim Hydromodification Criteria	Pursuant to NPDES permit Provision D.1.d.g.(6), the Copermittees prepared Interim Hydromodification Management criteria, which apply to projects disturbing 50 acres or more. The criteria are described in Chapter 2 and in memoranda on the Project Clean Water website.
Jurisdictional Urban Runoff Management Plan (JURMP)	A written description of the specific jurisdictional urban runoff management measures and programs that each Copermittee implements to comply with the stormwater NPDES permit and ensure pollutant discharges are reduced to the MEP and do not cause or contribute to a violation of water quality standards. See Stormwater Pollution Prevention Program.
Lead Agency	The public agency that has the principal responsibility for carrying out or approving a project. (CEQA Guidelines §15367).
Low Impact Development	An integrated site design methodology that uses small-scale detention and retention (Integrated Management Practices, or IMPs) to mimic pre-existing site hydrological conditions.
Maximum Extent Practicable (MEP)	Standard, established by the 1987 amendments to the Clean Water Act, for the implementation of municipal stormwater pollution prevention programs (see definition). According to the Act, municipal stormwater NPDES permits “shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.”
National Pollutant Discharge Elimination System (NPDES)	As part of the 1972 Clean Water Act, Congress established the NPDES permitting system to regulate the discharge of pollutants from municipal sanitary sewers and industries. The NPDES was expanded in 1987 to incorporate permits for stormwater discharges as well.
Numeric Criteria	Sizing requirements for stormwater treatment facilities established in Provision D.1.d.(6)(c) of the San Diego RWQCB’s stormwater NPDES permit.
Operation and Maintenance (O&M)	Refers to requirements in the Stormwater NPDES Permit to inspect treatment BMPs and implement preventative and corrective maintenance in perpetuity. See Chapter Five.
Parking Lot	A land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
Permeable Pavements	Pavements for roadways, sidewalks, or plazas that are designed to infiltrate a portion of rainfall, including pervious concrete, pervious asphalt, unit-pavers-on-sand, and crushed gravel.

Priority Development Project	A project subject to SUSMP requirements. Defined in Stormwater NPDES Permit Provision D.1.d.(1). See Chapter One.
Project Area	The entire project area comprises all areas to be altered or developed by the project, plus any additional areas that drain on to areas to be altered or developed.
Project Submittal	Documents (i.e., Major or Minor Stormwater Management Plan) submitted to the County in connection with an application for development approval and demonstrating compliance with Stormwater NPDES Permit requirements for the project.
Proprietary	A proprietary device is one marketed under legal right of the manufacturer.
Redevelopment	<p>The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces.</p> <p>Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair.</p>
Rational Method	A method of calculating runoff flows based on rainfall intensity, tributary area, and a factor representing the proportion of rainfall that runs off.
Regional (or Watershed) Stormwater Treatment Facility	A facility that treats runoff from more than one project or parcel.
Regional Water Quality Control Board (Regional Water Board or RWQCB)	California RWQCBs are responsible for implementing pollution control provisions of the Clean Water Act and California Water Code within their jurisdiction. There are nine California RWQCBs.
Retention	The practice of holding stormwater in ponds or basins, or within berms or depressed areas, and allowing it to slowly infiltrate into underlying soils. Some portion will evaporate. See definitions for infiltration and detention.
Self-retaining area	An area designed to retain runoff. Self-retaining areas may include graded depressions with landscaping or pervious pavements and may also include tributary impervious areas up to a 2:1 impervious-to-pervious ratio.
Self-treating area	A natural, landscaped, or turf area drains directly off site or to the public storm drain system.
Source Control	Land use or site planning practices, or structural or nonstructural measures that aim to prevent urban runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.

Standard Industrial Classification (SIC)	A Federal government system for classifying industries by 4-digit code. It is being supplanted by the North American Industrial Classification System but SIC codes are still referenced by the Regional Water Board in identifying development sites subject to regulation under the NPDES permit. Information and an SIC search function are available at <a href="http://www.bls.gov/bls/NAICS.htm">http://www.bls.gov/bls/NAICS.htm</a>
Stormwater NPDES Permit	A permit issued by a Regional Water Quality Control Board (see definition) to local government agencies (Dischargers) placing provisions on allowable discharges of municipal stormwater to waters of the state.
Storm Water Pollution Prevention Plan (SWPPP)	A plan providing for temporary measures to control sediment and other pollutants during construction as required by the statewide stormwater NPDES permit for construction activities.
Stormwater Pollution Prevention Program	A comprehensive program of activities designed to minimize the quantity of pollutants entering storm drains. See Jurisdictional Urban Runoff Management Plan.
Standard Urban Stormwater Mitigation Plan (SUSMP)	Refers to various documents prepared in connection with implementation of the stormwater NPDES permit mandate to control pollutants from new development and redevelopment.
Treatment	Removal of pollutants from runoff, typically by filtration or settling.
Treatment Control (Structural) BMP	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.
Water Board	See Regional Water Quality Control Board.
Water Quality Volume (WQV)	For stormwater treatment facilities that depend on detention to work, the volume of water that must be detained to achieve maximum extent practicable pollutant removal. This volume of water must be detained for a specified drawdown time.





## How to Use the SUSMP

*Review Chapters 1 and 2 to get a general understanding of the requirements. Then follow step-by-step instructions in Chapter 3 to prepare your Project Submittal.*

**T**HIS *Standard Urban Stormwater Mitigation Plan (SUSMP)* will help you ensure your project complies with the California Regional Water Quality Control Boards' requirements. Most applicants will require the assistance of a qualified civil engineer, architect, and/or landscape architect. Because every project is different, you should begin by checking specific requirements with County staff.

To use the *SUSMP*, start by reviewing [Chapter One](#) to find out whether and how stormwater quality requirements apply to your project. Chapter One also provides an overview of the process of planning, design, construction, operation, and maintenance leading to compliance.

If there are terms and issues you find puzzling, try finding answers in the glossary or in [Chapter Two](#). Chapter Two provides background on key stormwater concepts and water quality regulations, including design criteria.

Then proceed to [Chapter Three](#) and follow the step-by-step guidance to prepare a Project Submittal for your site.

[Chapter Four](#), the Low Impact Development Design Guide, includes design procedures, calculation procedures, and instructions for presenting your design and calculations in your Project Submittal.

In [Chapter Five](#) you'll find a detailed description of the process for ensuring operation and maintenance of your stormwater facilities over the life of the project. The chapter includes step-by-step instructions for preparing a Stormwater Facilities Operation and Maintenance Plan.

Throughout each Chapter, you'll find references and resources to help you understand the regulations, complete your Project Submittal, and design stormwater control measures for your project.

### Construction-Phase Controls

Your Project Submittal for SUSMP compliance is a separate document from the Storm Water Pollution Prevention Plan (SWPPP). A SWPPP provides for temporary measures to control sediment and other pollutants during construction at sites that disturb one acre or more. See the Construction Handbook at [www.cabmphandbooks.org](http://www.cabmphandbooks.org) for more information on SWPPPs.

The most recent, updated version of this *SUSMP*, including updates and errata between editions, is on the County's Department of Public Work's website. The on-line *SUSMP* is in Adobe Acrobat format. If you are reading the Acrobat version on a computer with an internet connection, you can use hyperlinks to navigate the document and to access various references. The hyperlinks are throughout the text, as well as in "References and Resources" sections and in the [Bibliography](#). Some of these links (URLs) may be outdated. In that case, try entering portions of the title or other keywords into a web search engine.

### ► PLAN AHEAD TO AVOID THE THREE MOST COMMON MISTAKES

The most common (and costly) errors made by applicants for development approvals with respect to stormwater quality compliance are:

1. Not planning for compliance early enough. You should consider your strategy for stormwater quality compliance before completing a conceptual site design or sketching a layout of subdivision lots (Chapter 3).
2. Assuming proprietary stormwater treatment facilities will be adequate for compliance. Most aren't (Chapter 2).
3. Not planning for periodic inspections and maintenance of treatment and flow-control facilities. Consider who will own and who will maintain the facilities in perpetuity and how they will obtain access, and identify which arrangements are acceptable to the County (Chapter 5).

## Policies and Procedures

*Determine if your development project must comply with stormwater quality requirements, and review the steps to compliance.*

### A Low Impact Development Design Procedure

The San Diego Regional Water Board reissued a municipal stormwater NPDES permit to the County of San Diego in January 2007. The permit updates and expands stormwater requirements for new developments and redevelopments. Stormwater treatment requirements have been made more stringent, minimum standards for Low Impact Development (LID) have been added, and the County is required to develop and implement criteria for the control of runoff peaks and durations from development sites.

To assist the land development community, streamline project reviews, and maximize cost-effective environmental benefits, a unified LID design procedure has been developed. This design procedure integrates site planning and design measures with engineered, small-scale Integrated Management Practices (IMPs) such as bioretention. By following the procedure, applicants can develop a single integrated design which complies with the complex and overlapping NPDES permit LID requirements, stormwater treatment requirements, and flow-control (hydromodification management) requirements.

The design approach is detailed in Chapter 4. General instructions for preparing a complete Project Submittal are in Chapter 3, and specific local submittal requirements are available from County staff.

Applicants may choose not to use this design procedure, in which case they will need to demonstrate, in their submittal, compliance with applicable LID criteria, stormwater treatment criteria, and flow-control criteria. These criteria are described in Chapter 2 and in the NPDES permit.

## Requirements for All Development Projects

All development projects must include control measures to reduce the discharge of stormwater pollutants to the maximum extent practicable.

In general, for projects that are not “Priority Development Projects,” this will include:

- Implementation of source control BMPs as listed in the Appendix E.
- Inclusion of some LID features that conserve natural features, set back development from natural water bodies, minimize imperviousness, maximize infiltration, and retain and slow runoff.
- Compliance with requirements for construction-phase controls on sediment and other pollutants.

County staff may also require additional controls appropriate to the project, which may include stormwater treatment controls. LID treatment controls such as infiltration or bioretention are preferred. See “Selection of Treatment Facilities” on page 26. If treatment facilities are included, provisions must be made to ensure their long-term maintenance.

## Priority Development Projects

The NPDES permit requires that more specific runoff treatment controls be incorporated into Priority Development Projects.

### ► NEW DEVELOPMENT

Projects on previously undeveloped land are Priority Development Projects if they are in one or more of the categories listed in Table 1-1. If a project feature such as a parking lot falls into a Priority Development Project category, then the entire project footprint is subject to Priority Project requirements. To use the table, review each definition A through J. If any of the definitions match, the project is a Priority Development Project. Note some thresholds are defined by square footage of impervious area created; others by the total area of the development.

### ► PREVIOUSLY DEVELOPED SITES

Projects on previously developed sites (“redevelopment projects”) are Priority Development Projects if they create, add, or replace 5,000 square feet or more of impervious surface and also are in one of the categories listed in Table 1-1.

Local municipal staff may choose to designate projects not within the categories in Table 1-1 as Priority Development Projects, based on potential impacts to stormwater quality.

TABLE 1-1. Priority Development Projects.

Is the project in any of these categories?			
Yes <input type="checkbox"/>	No <input type="checkbox"/>	A	Housing subdivisions of 10 or more dwelling units. Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	B	Commercial—greater than one acre. Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	C	Heavy industry—greater than one acre. Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes <input type="checkbox"/>	No <input type="checkbox"/>	D	Automotive repair shops. A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	E	Restaurants. Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	F	Hillside development greater than 5,000 square feet. Any development that creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	G	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.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	H	Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	I	Street, roads, highways, and freeways. Any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	J	Retail Gasoline Outlets (RGOs) that are: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

The “50% Rule” for previously developed projects. Projects on previously developed sites may also need to retrofit drainage of ALL impervious areas of the ENTIRE project site. For projects creating or replacing more than 5,000 square feet of impervious area:

- If the new project results in an increase of, or replacement of, 50% or more of the previously existing impervious surface, and the existing development was not subject to SUSMP requirements, then the entire project must be included in the treatment measure design.
- If less than 50% of the previously impervious surface is to be affected, only that portion must be included in the treatment measure design.

If a Redevelopment project feature such as a parking lot falls into a Priority Development Project category, then the entire project footprint is subject to Priority Project requirements.

Projects not subject to treatment requirements are limited to interior remodels, trenching and resurfacing associated with utility work, routine maintenance or repair, roof or exterior surface replacement, resurfacing and reconfiguring surface parking lots and existing roadways, new sidewalk construction, pedestrian ramps, or bike lanes on existing roads, and routine replacement of damaged pavement such as pothole repair. However, other requirements, including incorporation of appropriate source controls, still apply.

► POLLUTANT GENERATING PROJECTS WHICH DISTURB ONE ACRE OR MORE OF LAND

Projects that generate pollutants at levels greater than background levels which disturb one acre or more of land and include housing subdivisions of 10 or more dwelling units are considered Priority Development Projects.

## Compliance Process at a Glance

For the applicant for development project approval, stormwater compliance follows these general steps:

1. Discuss requirements during a pre-application meeting with County staff.
2. Review the instructions in this SUSMP before you prepare your tentative map, preliminary site plan, drainage plan, and landscaping plan.
3. Prepare your SWMP, which is typically made with your application for development approvals (entitlements).
4. Create your detailed project design, incorporating the features described in your SWMP.
5. In a table on your construction plans, list each stormwater compliance feature and facility and the plan sheet where it appears.

6. Prepare a draft Stormwater Facility Operation and Maintenance Plan and submit it as required by your local jurisdiction.
7. Maintain stormwater facilities during construction and following construction in accordance with required warranties.
8. Following construction, formally transfer responsibility for maintenance to the owner.
9. The owner must ensure stormwater facilities remain functional and periodically verify stormwater facilities are properly maintained.

Preparation of a complete and detailed SWMP is the key to cost-effective stormwater compliance and expeditious review of your project.

## Phased Projects

When determining whether SUSMP requirements apply, a “project” should be defined consistent with California Environmental Quality Act (CEQA) definitions of “project.” That is, the “project” is the whole of an action which has the potential for adding or replacing or resulting in the addition or replacement of roofs, pavement, or other impervious surfaces and thereby resulting in increased flows and stormwater pollutants. “Whole of an action” means the project may not be segmented or piecemealed into small parts if the effect is to reduce the quantity of impervious area for any part to below the SUSMP thresholds.

CEQA  
Preparers of CEQA documents  
may wish to visit the following  
Department of Planning and  
Land Use website:  
[http://cww.co.san-  
diego.ca.us/dplu/Resource/rp\\_p  
rocedures/rp\\_env\\_proc.html](http://cww.co.san-diego.ca.us/dplu/Resource/rp_procedures/rp_env_proc.html)

County staff may require, as part of an application for approval of a phased development project, a conceptual or master SWMP which describes and illustrates, in broad outline, how the drainage for the project will comply with the SUSMP requirements. The level of detail in the conceptual or master SWMP should be consistent with the scope and level of detail of the development approval being considered. The conceptual or master SWMP should specify that a more detailed SWMP for each later phase or portion of the project will be submitted with subsequent applications for discretionary approvals.

Note these minimum standards for SUSMP applicability are for the purpose of ensuring a consistent minimum level or “floor” for countywide implementation consistent with the requirements of the NPDES permit. The County may choose a more expansive interpretation of the NPDES permit’s applicability and may also choose to apply source control, treatment, and flow-control requirements to projects that would be exempt under these minimum standards.

## New Subdivisions

If a tentative map approval would potentially entitle future owners to construct new or replaced impervious area which, in aggregate, could exceed one of the SUSMP thresholds (Table 1-1),

then the applicant must take steps to ensure SUSMP requirements can and will be implemented as the subdivision is built out.

If the tentative map application does not include plans for site improvements, the applicant should nevertheless identify the type, size, location, and final ownership of stormwater treatment and flow-control facilities adequate to serve common private roadways and any other common areas, and to also manage runoff from an expected reasonable estimate of the square footage of future roofs, driveways, and other impervious surfaces on each individual lot. The County may condition approval of the map on implementation of stormwater treatment and other SUSMP measures when construction occurs on the individual lots. At the County's discretion, this condition may be enforced by a grant deed of development rights or by a development agreement.

If the County deems it necessary, the future impervious area of one or more lots may be limited by a deed restriction. This might be necessary when a project is exempted from one or all SUSMP provisions because the total impervious area is below a threshold, or to ensure runoff from impervious areas added after the project is approved does not overload a stormwater treatment and flow-control facility.

The County may require subdivision maps to dedicate an "open space easement, as defined by Government Code Section 51075," to suitably restrict the future building of structures at each stormwater facility location if necessary.

In general, in new subdivisions stormwater treatment, infiltration, or flow-control facilities should not be located on individual single-family residential lots, particularly when those facilities manage runoff from other lots, from streets, or from common areas. A better alternative is to locate stormwater facilities on one or more separate, jointly owned parcels.

After consulting with local planning staff, applicants for subdivision approvals will propose one of the following four options, depending on project characteristics and local policies:

1. Show the number of parcels and the total impervious area to be created on all parcels could not, in the future, exceed any of the thresholds in Table 1-1.
2. Show that, for each and every lot, the intended use can be achieved with a design which disperses runoff from roofs, driveways, streets, and other impervious areas to self-retaining pervious areas, using the criteria in Chapter 4.
3. Prepare improvement plans showing drainage to treatment and/or flow-control facilities designed in accordance with this SUSMP, and commit to constructing the facilities prior to transferring the lots.
4. Prepare improvement plans showing drainage to treatment and/or flow-control facilities designed in accordance with this SUSMP, and provide appropriate legal instruments to ensure the proposed facilities will be constructed and maintained by subsequent owners.



For the option selected, County staff will determine the appropriate conditions of approval, easements, deed restrictions, or other legal instruments necessary to assure future compliance.

## Private Development and Public Improvement Procedures

Private development and public improvement projects conducted within the County must address stormwater quality during the project planning, design, construction, and post-construction phases. The procedures for addressing stormwater quality are outlined in this SUSMP.

### ► PRIVATE DEVELOPMENT PROJECTS

Projects submitted to the County for review and approval may be subject to the requirements of the Municipal Permit. Development and redevelopment projects submitted for review and approval will be screened to determine the level of stormwater quality management required. Each proposed project is required to implement measures to ensure that:

1. Pollutant discharges and runoff flows from development are reduced to the maximum extent practicable; and
2. Receiving water quality objectives are not violated throughout the life of the project.

The process to address stormwater quality involves the development of a Storm Water Management Plan (SWMP) at the earliest stage of the project application process, which includes details of post-construction BMPs early in the design process, construction BMPs, and the implementation of a long-term post-construction maintenance program. A key element of the process is the selection of BMPs as described in Chapter 4.

### Types of Permits

The County issues either a discretionary or ministerial permit. Both types of permits are required to address water quality. For priority development projects, the County will approve the SWMP project plan(s) as part of the development plan approval process for discretionary permits and prior to issuing permits for ministerial projects.

The following discretionary permits shall address stormwater management:

- a) Administrative Permit for Clearing
- b) Agricultural Exemption
- c) Lot Line Adjustment
- d) Final Map Modification
- e) Grading Plan (including Modification or Renewal)
- f) Improvement Plan (including Modification)

- g) Landscape Plan
- h) Major Use Permit (including Modification, Minor Deviation, or Extension)
- i) Minor Use Permit (including Modification, Minor Deviation, or Extension)
- j) Parcel Map Modification
- k) Reclamation Plan
- l) Site Plan (including Amendment)
- m) Solid Waste Facility Permit
- n) Tentative Map (including Resolution Amendment or Time Extension)
- o) Tentative Parcel Map
- p) Variance
- q) Watercourse Permit

The following ministerial permits shall address stormwater management:

- a) Building Permit
- b) Construction Right of Way Permit
- c) Encroachment Permit
- d) Excavation Permit
- e) On-site Wastewater System Permit
- f) Underground Tank Permit
- g) Well Permit

#### Submission of SWMP

Development and submittal of a SWMP is part of the Project Application and is prepared by the project proponent. This plan serves as the basis for a long-term solution to water quality improvements. Early consideration and planning of permanent BMPs ensures that water quality will be addressed for many years to come. Also, treatment BMPs are often difficult to add to the completed design of a development project without causing substantial changes to the project's character or viability. The earlier in the design process stormwater facilities are considered, the greater the chance a successful and efficient design can be accomplished.

The SWMP provides the needed information to address both stormwater and non-stormwater issues. The purpose of the SWMP is as follows:

- To provide all the information needed to fully and adequately characterize the existing water quality;
- Analyze the drainage, develop effective post-construction stormwater protection, and;
- Ensure the effectiveness of the BMPs through proper maintenance and long-term fiscal responsibility.

Information from the SWMP shall be used in formulating staff's CEQA responses and proposed conditions for the project. The SWMP serves as the proponent's plan for compliance with the County's SUSMP requirements. The SWMP is a living document and could require changes if one of the following conditions apply:

- The project evolves to a Priority Project;
- The plans submitted for a Grading Permit are substantially different than those submitted as part of initial application, or;
- A Stormwater Impact Analysis is needed.

For priority development projects, the SWMP requires additional information including a more detailed description of the project. Data from the project drainage report are utilized to determine the size of treatment BMPs and assess the need for temporary storage to capture increased runoff. Pollutants and conditions of concern derived from the San Diego Basin Plan are described in the SWMP. In addition, the SWMP requires projects to establish BMPs based on three categories: site design, source control and treatment control taking into account Low Impact Development and Hydromodification Plan requirements. An example of a SWMP for priority development projects is included as Appendix C.

#### SWMP Process

The SWMP is formatted to follow this manual. The County requires a SWMP at time of initial application contains the minimum project elements as identified below. The SWMP shall be prepared by the project proponents and comply with the WPO.

- Owner's Certification
- STEP 1: Priority Development Project Determination;
- STEP 2: Project Stormwater Quality Determination;
- STEP 3: Hydromodification Determination;

- STEP 4: Pollutants of Concern Determination;
- STEP 5: LID and Site Design Strategies;
- STEP 6: Source Control BMPs;
- STEP 7: LID and Treatment Control Selection, and;
- STEP 8: Operation and Maintenance.

The SWMP shall be prepared with the sections set forth in the example in Appendix C. Since the SWMP is a living document, the initial submission, provided during project initiations, need not include BMPs engineered in accordance to the drainage report nor a comprehensive maintenance plan. The BMPs should be conceptually sized and located. An addendum will be provided as part of the Grading Permit application. The SWMP addendum, as part of the Grading Permit application, will include the properly engineered BMP and a refined maintenance plan. All treatment BMPs shall be incorporated in the design plans.

#### Review and Approval Process

County staff in the departments of Public Works and Planning & Land Use shall review the SWMP as part of the overall project application. Review of the SWMP begins with the Stormwater Intake Form for Development Projects (Appendix B). As previously noted, information from the SWMP shall be used in formulating CEQA responses and findings, findings of project code compliance, and in proposing conditions for the project.

Upon submittal of the project application staff will initiate a review. Staff will complete a draft Initial Study/Environmental Analysis Form (IS/EA Form), which addresses water quality issues.

During project review, and as part of the CEQA process, staff evaluates all discretionary applications for potential impacts to environmental resources, including stormwater. If a proposed project has been reviewed previously under CEQA, and a certified/approved environmental document exists for the project, staff reviews this documentation to determine if adequate information is included to address the requirements under the WPO. If no such information exists in the previous documentation, or the information does not adequately address the requirements under the WPO, and it is deemed necessary by staff on the basis of the type or scale of project, a Stormwater Impact Analysis Report is required for the project following the procedures outlined below.

Even if a project is exempt from the CEQA process, it still must be found in compliance with the WPO and go through the review process.

For those projects without any previous environmental documentation, or if insufficient documentation exists, staff reviews the project for stormwater issues in the following manner:

### Prioritization

The project is reviewed using the County's desktop-based GIS application, existing regional land use maps, and other related resources including the prioritization criteria from Municipal Permit section (D.1.d. (2)), to determine the project's prioritization, and potential stormwater impacts from post-construction activities. The prioritization of projects will be used when determining which projects must meet SUSMP requirements. As part of this process, staff from the DPLU and DPW review the SWMP, Preliminary Grading Plan or other hydrologic information submitted with the Project's application package, and determine what issues must be addressed.

### Conditions of Project Approval

Recommendations from the SWMP regarding structural BMPs and the long-term maintenance for the project is used in formulating conditions of project approval. The conditions will typically specify that the requirements of the SWMP shall be implemented. The conditions will be structured to assure that grading or other actions that could threaten water quality or contribute to contaminated stormwater run-off will not be allowed until all required BMPs and other actions are implemented to the satisfaction of the County.

In addition, if the proposed structural BMPs require long-term maintenance, the applicant will be required to take all necessary measures, to the satisfaction of the County that such ongoing maintenance will occur to prevent water quality pollution.

### Non-Priority Projects

Projects that do not meet the priority project criteria are considered non-priority projects. As such, these projects need only to complete a Minor SWMP unless the County requires a SWMP for the project. In addition, the following types of projects/permits typically address water quality via a Minor SWMP.

- Construction Right of Way Permits;
- Encroachment Permits;
- Minor Excavation Permits;
- Variances;
- Boundary Adjustments;
- Driveways for Single Private Residences;
- Minor Use Permits for Cellular Facilities, and;
- Residential Tentative Parcel Maps.

#### ► CAPITAL IMPROVEMENT PROJECTS

The process of addressing stormwater quality for capital improvement projects (CIP) is essentially the same as land development projects. SUSMP requirements are incorporated into the project design and shown on the plans prior to bidding for construction contracts, or equivalent.

#### ► CONSTRUCTION PHASE BMPS

This manual does not explicitly provide guidance for construction phase BMPS. All projects are required to address construction BMPS in accordance with ordinances, rule or regulation, statute, or other provisions of law. There is a requirement in the SWMP to provide a basic description of the BMPS proposed during construction. Projects that qualify under the definition of the Statewide General Construction Permit, are required to develop a Storm Water Pollution Prevention Plan as part of the Grading Permit process. Inspection procedures have been established to ensure compliance during the construction phase.

## Compliance with Flow-Control Requirements

Priority Development Projects (Table 1-1) must be designed so that runoff rates and durations are controlled to maintain or reduce downstream erosion conditions and protect stream habitat.

For projects disturbing areas smaller than 50 acres, this can be accomplished by implementing Low Impact Development (LID) design using the design criteria and procedures in Chapter 4. The criteria will be updated following RWQCB approval of the Copermittees' Hydromodification Management Plan (see Option 2 below).

Priority Development Projects disturbing 50 acres or more must meet the following interim hydromodification standard:

“...post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations ... where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to increased flow rates and durations.”

The San Diego Copermittees are developing a Hydromodification Management Plan (HMP) in compliance with Provision D.1.g of the NPDES Permit. As required, the County has adopted interim hydromodification criteria which will be superseded after the HMP is accepted by the Regional Water Board.

Compliance with the interim hydromodification criteria can be achieved by one of the following options:

1. Use a continuous simulation hydrologic computer model such as USEPA's Hydrograph Simulation Program—Fortran (HSPF) to simulate pre-project and post-project runoff, including the effect of proposed IMPs, detention basins, or other stormwater management facilities, and demonstrate the standard is achieved.
2. Use Low Impact Development Integrated Management Practices to manage hydrograph modification impacts, using design procedures, criteria, and sizing factors (ratios of LID IMP volume or area to tributary area) specified by the County.
3. Identify an exemption applicable to the site.

► OPTION 1: CONTINUOUS SIMULATION

Prepare an analysis of pre-project and post-project runoff following the instructions in the memoranda “Using Continuous Simulation to Size Stormwater Control Facilities” (May 9, 2008) and “Development of Interim Hydromodification Criteria” (October 30, 2007). Both memoranda are available on the Project Clean Water website.

Before preparing the analysis, discuss with County staff the required documentation for your SWMP, which will include assumptions and modeling parameters used in the analysis and a graphical presentation demonstrating compliance with the following:

1. For flow rates from 20% of the pre-project 5-year runoff event (0.2Q5) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve.
2. For flow rates from 0.2Q5 to Q5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q5 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10. (Note that the 0.2Q5 end of the range may be modified).

► OPTION 2: LID INTEGRATED MANAGEMENT PRACTICES (IMP'S)

Low Impact Development Integrated Management Practices, such as bioretention facilities, planter boxes, and dry wells, can achieve the hydromodification standard. However, the County has not yet prepared design criteria and sizing factors for these facilities applicable to projects 50 acres or more. Project proponents for projects 50 acres or more may use Option 1 to demonstrate their IMPs meet the interim criteria.

► OPTION 3: EXEMPTION FROM HYDROMODIFICATION MANAGEMENT

Exemption from the IHC is allowed for development projects when any of the following conditions are met. (However, plans to restore a channel reach may re-introduce the applicability of hydromodification management.)

1. The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;
2. The project would discharge into underground storm drains discharging directly to bays or the ocean;
3. The project would discharge to a channel where the sub-watershed areas below the project's discharge points are highly impervious (e.g. >70%) and the potential for single-project and/or cumulative impacts is minimal; or
4. The applicant conducts an assessment incorporating sediment transport modeling across the range of geomorphically-significant flows that demonstrates project flows and sediment reductions will not detrimentally affect the receiving water. A May 15, 2008 memorandum, "Geomorphic Analysis for Interim Hydrograph Modification Plan" is available on the Project Clean Water website.

Grandfathering. Projects with prior lawful approval (such as a development agreement, vested tentative map, or a building or grading permit) that have started construction before March 25, 2008, may not have to meet the interim hydromodification management requirements. Verify with County staff.

Note these are interim requirements and will be superseded following approval of the HMP by the Regional Water Board sometime after mid-2010. Updated hydromodification criteria for all Priority Development Projects will be incorporated into local SUSMP requirements sometime in 2010 or later.

## Waivers from Numeric Sizing Criteria

The NPDES permit allows for a project to be waived from numeric sizing criteria for stormwater treatment only if all available treatment facilities have been considered and found infeasible. County staff must inform the Water Board within 5 days of granting a waiver. Other SUSMP requirements—including site designs to minimize imperviousness and source control BMPs—will still apply.

Experience has shown implementation of LID facilities, as described in Chapter 4, is feasible on nearly all development sites. However, the use of LID to retrofit existing drainage systems, to manage runoff from sites smaller than one acre in pedestrian-oriented developments, or to manage runoff from widened portions of roadways, sometimes presents special challenges. In these special situations, applicants should see the discussion of "Selection of Stormwater Treatment Facilities" in Chapter 2 and evaluate the options described on page 28 in order (depending on the specific characteristics of the project and as determined by local development review staff). All the options listed meet the numeric sizing criteria in the NPDES permit.

If infeasibility of all these options can be established, County review staff may determine eligibility of the project for a waiver.



References and Resources:

- RWQCB Order R9-2007-0001 (Stormwater NPDES Permit)
- Project Clean Water web page



## Concepts and Criteria

*Technical background and explanations of policies and design requirements*

The Regional Water Board reissued a municipal stormwater NPDES permit to San Diego County, its 18 cities, the San Diego Unified Port District, and the San Diego Regional Airport Authority in January 2007. The permit mandates a comprehensive program to prevent stormwater pollution. That program now includes street sweeping, maintenance of storm drains, business inspections, public outreach, construction site inspections, monitoring and studies of stream and ocean health, and control of runoff pollutants from new developments and redevelopments.

Permit Provision D.1.d. requires the County to regulate projects in specific categories (Table 1-1) to:

1. Reduce discharges of pollutants to the maximum extent practicable.
2. Prevent runoff discharges from causing or contributing to a violation of water quality standards.

The Copermittees have created a Low Impact Development (LID) design procedure (Chapter 4) that ensures consistent and thorough implementation of the Regional Water Board's requirements. This chapter explains the technical background of the LID approach and how it was derived.

The previous permit, issued in 2001, included a requirement to control the post-development peak storm water runoff rates and velocities to maintain or reduce pre-development downstream erosion and protect stream habitat. The 2007 permit includes, in addition to this ongoing requirement, a new requirement to develop a hydromodification management plan (HMP) to identify and define a methodology and performance criteria to ensure flow rates and durations do not exceed pre-project runoff where increased runoff could cause erosion or other significant adverse impacts to beneficial uses.

As required by the NPDES permit, the County has adopted interim hydromodification criteria. See Chapter One.

## Water-Quality Regulations

Provision D.1 requires the County to condition development approvals on incorporation of specified stormwater controls.

Provision D.1 requires applicable new developments and redevelopments:

- Design the site to conserve natural areas, existing trees and vegetation and soils, to maintain natural drainage patterns, to minimize imperviousness, to detain runoff, and to infiltrate runoff where feasible
- Cover or control sources of stormwater pollutants
- Treat runoff prior to discharge. Provision E.10 states: “Urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S.”
- Ensure runoff does not exceed pre-project peaks and durations where increases could affect downstream habitat or other beneficial uses
- Maintain treatment and flow-control facilities

The County maintains a database to track approved installations of treatment facilities and to verify facilities are maintained. The County’s annual report to the Regional Water Board includes a list of development projects subject to SUSMP conditions and descriptions of those projects that:

- Received a waiver from SUSMP criteria;
- Used hydrologic controls used to meet HMP requirements, including a description of the controls; and
- Have an area of 50 acres or greater, thus subject to Interim Hydromodification Criteria;

The County must also report the number of violations and enforcement actions taken upon development projects. The County’s program is subject to audit by the Regional Water Board.

The County—not the Regional Water Board or its staff—is charged with ensuring development projects comply with the D.1 requirements. Regional Water Board staff sometimes review stormwater controls and hydromodification impacts in connection with applications for Clean Water Act Section 401 water-quality certification, which is required for projects that involve work, such as dredging or placement of fill, within streams, creeks, or other waters of the US.

## ► MAXIMUM EXTENT PRACTICABLE

[Clean Water Act Section 402\(p\)\(3\)\(iii\)](#) sets the standard for stormwater controls as “maximum extent practicable,” but doesn’t define that term. As implemented, “maximum extent practicable” is ever-changing and varies with conditions.

Many stormwater controls, including LID facilities, have proven to be practicable in most site development projects. To achieve fair and effective implementation, criteria and guidance, requirements for controls must be detailed and specific—while also offering the right amount of flexibility or exceptions for special cases. The NPDES permit includes various standards, including hydrologic criteria, which have been found to comprise “maximum extent practicable.” This SUSMP is to be continuously improved and refined based on the experience of County planners and engineers, with input from land developers and development professionals. By following the SUSMP, applicants can ensure their project design meets “maximum extent practicable.”

## ► BEST MANAGEMENT PRACTICES

Clean Water Act Section 402(p) and USEPA regulations (40 CFR 122.26) specify a municipal program of “management practices” to control stormwater pollutants. Best Management Practice (BMP) refers to any kind of procedure, activity or device designed to minimize the quantity of pollutants that enter the storm drain system. BMPs are typically used in place of assigning numeric effluent limits. The criteria for source control BMPs and treatment and flow-control facilities are crafted to fulfill “maximum extent practicable.”

To minimize confusion, this guidebook refers to “facilities,” “features,” or “controls” to be incorporated into development projects. All of these are BMPs.

## Pollutants of Concern

NPDES Permit Provision D.1.d.(3) requires each Copermittee to develop and implement a procedure for pollutants of concern to be identified for each Priority Development Project. The Copermittees have considered this requirement jointly and have determined the LID design procedures in Chapters 3 and 4 of the model and this SUSMP fully address the need to identify pollutants of concern insofar as that identification may affect the selection of source control BMPs and treatment facilities.

Documentation of the approach to identifying pollutants of concern and selecting BMPs and facilities follows.

## ► GROUPING OF POTENTIAL POLLUTANTS OF CONCERN

Urban runoff from a developed site has the potential to contribute pollutants, including oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system and receiving waters. For the purposes of identifying pollutants of concern and associated storm water BMPs, pollutants are grouped in nine general categories as follows:

- 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.
- 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.
- Metals are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary sources of metal pollution in storm water are 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. At low concentrations naturally occurring in soil, metals are not 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.
- 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 storm drains. 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.
- 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 & 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. Also, 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 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.

- 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.
- 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.
- Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

#### ► IDENTIFYING POLLUTANTS OF CONCERN BASED ON LAND USES

Table 2-1 associates pollutants with the categories of Priority Development Projects. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

#### ► WATERSHEDS WITH SPECIAL POLLUTANT CONCERNS

Local receiving water conditions may require specialized attention. The three local conditions to consider include:

- Ocean waters designated as an “Area of Special Biological Significance” (ASBS)
- 303(d) listed waters; and
- Waters with established TMDLs.

TABLE 2-1. ANTICIPATED AND POTENTIAL Pollutants Generated by Land Use Type.

	General Pollutant Categories								
Priority Project Categories	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >one acre	P(1)	P(1)	X	P(2)	X	P(5)	X	P(3)	P(5)
Heavy Industry	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	P(1)
Hillside Development >5,000 ft <sup>2</sup>	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X	X	P(1)
X = anticipated P = potential (1) A potential pollutant if landscaping exists on-site. (2) A potential pollutant if the project includes uncovered parking areas. (3) A potential pollutant if land use involves food or animal waste products. (4) Including petroleum hydrocarbons. (5) Including solvents.									



The State Water Resources Control Board's California Ocean Plan identifies thirty-four locations along the California coast as Areas of Special Biological Significance (ASBS). The Ocean Plan prohibits the discharge of wastes into these locations, thus barring discharges associated with industrial activities, publicly owned treatment works, and other traditional point discharges. In 2004 the SWRCB informed affected municipal stormwater programs throughout the state that urban runoff contained a waste and was subject to the prohibition. In March 2008, the SWRCB released a draft *Special Protections for Selected Storm Water and Nonpoint Source Discharges into Areas of Special Biological Significance* that defines design criteria for treating stormwater discharges and elimination of dry-weather discharges associated with non-stormwater sources. San Diego County contains two ASBS locations, the La Jolla ASBS and the San Diego-Scripps ASBS. These locations are adjacent and extend from the northern bluffs of La Jolla through the UC San Diego campus of the Scripps Institute of Oceanography. Proposed development in the watershed of an ASBS may be prohibited; however, the project proponent should immediately contact the County for further guidance in contending with ASBS prohibitions.

The NPDES Permit identifies several receiving waters as impaired for constituents or water quality effects pursuant to Section 303(d) of the Clean Water Act. Placement of a water onto the list requires the Regional Board to make further analysis of the impairment and development of total maximum daily loads (TMDLs) for addressing the impairment. The 303(d) listing in itself does not demand that a project proponent select BMPs on the basis of the impairment; however, the project proponent should be cognizant of the impairment and the future implications a TMDL might have upon the proposed land use.

Once a TMDL is established it may impose conditions on development either through an implementation plan and schedule for the listed water, or through special conditions required of the municipality affected by the numeric criteria of the TMDL. At this time, several 303(d) listings in San Diego County are at various stages of TMDL development with only four TMDLs having been adopted by the Regional Board. However, there are approximately 190 pending TMDLs in the county.

The adopted TMDLs in the San Diego area include:

- Diazinon for Chollas Creek;
- Nitrogen and phosphorous for Rainbow Creek;
- Dissolved copper for Shelter Island Yacht Basin;
- Copper, lead, and zinc for Chollas Creek, and
- Indicator bacteria for beaches and creeks in the San Diego Region.

The applicant should meet with County staff to determine if any project characteristics or watershed characteristics affect selection and design of BMPs. Except in rare circumstances, the use of the LID Design Guide (Chapter 4) and the Stormwater Pollutant Sources/Source Control Checklist (Appendix E) will ensure your project complies with all stormwater requirements.

## Selection of Permanent Source Control BMPs

Based on identification of potential pollutants of concern associated with various types of facilities, the Copermittees have developed a Stormwater Pollutant Sources/Source Control Checklist (Appendix E) of “maximum extent practicable” source controls associated with each facility type. This approach ensures appropriate BMPs are applied to potential sources of each pollutant of concern.

## Selection of Stormwater Treatment Facilities

The model SUSMP updated in early 2008 groups pollutants of concern by how easily they are removed by various treatment processes (Table 2-2).

The same document also includes a general comparison of how various types of treatment facilities perform for each group of pollutants (Table 2-3).

TABLE 2-2. GROUPING OF POTENTIAL POLLUTANTS of Concern by fate during stormwater treatment

Pollutant	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	X	X	
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

TABLE 2-3. GROUPS OF POLLUTANTS and relative effectiveness of treatment facilities

Pollutants of Concern	Bioretention Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Constructed Wetlands	Infiltration Facilities or Practices (LID)	Media Filters	Higher-rate biofilters*	Higher-rate media filters*	Trash Racks & Hydro-dynamic Devices	Vegetated Swales
Coarse Sediment and Trash	High	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low	Medium
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low	Low

\*See page 28 for a discussion of selection of treatment facilities in special situations.

#### ► PREFERRED TREATMENT FACILITIES

Based on this analysis, the Copermittees have determined that the following types of facilities are appropriate for treatment of runoff potentially containing most pollutants of concern. These types of facilities can be used for stormwater treatment for all land uses in all watersheds, except where site-specific constraints make them infeasible.

- Infiltration facilities or practices, including dry wells, infiltration trenches, infiltration basins, and other facilities that infiltrate runoff to native soils (sized to detain and infiltrate a volume equivalent to the 85<sup>th</sup> percentile 24-hour event).
- Bioretention facilities that detain stormwater and filter it slowly through soil or sand (sized with a surface area at least 0.04 times the effectively impervious tributary area).

The recommended design procedure in Chapter 4 integrates LID practices—optimizing the site design, using pervious surfaces, and dispersing of runoff to adjacent pervious areas—with the use of infiltration facilities and practices and bioretention facilities to meet NPDES permit LID requirements, treatment requirements, and flow-control requirements in a cost-effective, unified design.

#### ► ALTERNATIVE TREATMENT FACILITIES

Alternative treatment facilities, including media filters and extended detention basins are less effective at removing pollutants and should be used only as described in Alternatives to Integrated LID Design (page 64), or in combination with more effective facilities. Extended detention basins, wet ponds, and wetlands or other facilities using settling should be sized to detain a volume equivalent to runoff from the tributary area generated by the 85th percentile 24-hour event.

Oil/water separators (“water quality inlets”), storm drain inlet filters, and hydrodynamic separators, including vortex separators and continuous deflection separators (“CDS units”), are less effective means of stormwater treatment, although they may be used in series with more effective facilities.

Underground vaults typically lack the detention time required for settling of fine particles associated with stormwater pollutants. They also require frequent maintenance and may retain stagnant water, potentially providing habitat for mosquitoes. Because vaults may be “out of sight, out of mind,” experience shows that the required maintenance may not occur.

Lack of space, in itself, is not a suitable justification for using a less-effective treatment on a development site, because the uses of the site and the site design can be altered as needed to accommodate bioretention facilities or planter boxes. In most cases, these effective facilities can be fit into required landscaping setbacks, easements, or other unbuildable areas.

Where possible, drainage to inlets, and drainage away from overflows and underdrains, should be by gravity. Where site topography makes it infeasible to accommodate gravity-fed facilities in

the project design, the design flow may be captured in a vault or sump and pumped via force main to an effective facility.

The following situations sometimes present special challenges:

- Portions of sites which are not being developed or redeveloped, but which must be retrofit to meet treatment requirements in accordance with Provision D.1.d.(1)(a) which states in part: “Where redevelopment results in an increase of, or replacement of, more than fifty percent of the impervious surface of a previously existing development, the numeric sizing criteria applies to the entire development.”
- Sites smaller than one acre approved for development or redevelopment as part of the County’s stated objective to preserve or enhance a pedestrian-oriented “smart-growth” type of urban design. The County may choose to identify areas where this objective applies, based on General Plans or zoning.
- Roadway widening projects.

In these special situations, the following types of facilities should each be evaluated in priority order (depending on the specific characteristics of the site and as determined by County staff) until a feasible design is found.

1. Bioretention areas or planter boxes fed by gravity.
2. Capture of the design flow in a vault or sump and pumping to bioretention areas or planter boxes.
3. A subsurface sand or media filter with a maximum design surface loading rate of 5 inches per hour and a minimum media depth of 18 inches. The sand surface must be made accessible for periodic inspection and maintenance (for example, via a removable grating).
4. A higher-rate surface biofilter, such as a tree-pit-style unit. The grading and drainage design should minimize the area draining to each unit and maximize the number of discrete drainage areas and units.
5. A higher-rate vault-based filtration unit (for example, vaults with replaceable cartridge filters filled with inorganic media).

#### Proprietary Devices

Many currently available proprietary devices do not meet the County’s requirements when used alone for stormwater treatment. Consult with County staff before proposing these devices.

Many proprietary stormwater treatment devices are currently marketed, and new brands will be introduced. Applicants and applicants’ engineers and design professionals should review with County staff any proposals for using proprietary devices for stormwater treatment before they commence work on preliminary site layout, drainage plans, grading plans, or landscape plans.

## Hydrology for NPDES Compliance

### ► IMPERVIOUSNESS

[Schueler \(1995\)](#) proposed imperviousness as a “unifying theme” for the efforts of planners, engineers, landscape architects, scientists, and local officials concerned with urban watershed protection. Schueler argued (1) that imperviousness is a useful indicator linking urban land development to the degradation of aquatic ecosystems, and (2) imperviousness can be quantified, managed, and controlled during land development.

Imperviousness has long been understood as the key variable in urban hydrology. Peak runoff flow and total runoff volume from small urban catchments is usually calculated as a function of the ratio of impervious area to total area (rational method). The ratio correlates to the runoff factor, usually designated “C”. Increased flows resulting from urban development tend to increase the frequency of small-scale flooding downstream.

Imperviousness links urban land development to degradation of aquatic ecosystems in two ways.

First, the combination of paved surfaces and piped runoff efficiently collects urban pollutants and transports them, in suspended or dissolved form, to surface waters. These pollutants may originate as airborne dust, be washed from the atmosphere during rains, or may be generated by automobiles and outdoor work activities.

Second, increased peak flows and runoff durations typically cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. Measures taken to control stream erosion, such as hardening banks with riprap or concrete, may permanently eliminate habitat. By reducing infiltration to groundwater, imperviousness may also reduce dry-weather stream flows.

Imperviousness has two major components: rooftops and transportation (including streets, highways, and parking areas). The transportation component is usually larger and is more likely to be directly connected to the storm drain system.

The effects of imperviousness can be mitigated by disconnecting impervious areas from the drainage system and by encouraging detention and retention of runoff near the point where it is generated. Detention and retention reduce peak flows and volumes and allow pollutants to settle out or adhere to soils before they can be transported downstream.

### ► LOW IMPACT DEVELOPMENT REQUIREMENTS

The NPDES permit requires LID be used on all projects to minimize directly connected impervious area and promote infiltration. For Priority Development Projects, the minimum standards are:

- Drain a portion of impervious areas into pervious areas, if any.

- Design and construct pervious areas, if any, to effectively receive and infiltrate runoff from impervious areas, taking into account soil conditions, slope, and other pertinent factors.
- Construct a portion of paved areas with low traffic and appropriate soil conditions with permeable surfaces.

The LID design procedure in Chapter 4 incorporates these requirements into an integrated design which also meets sizing requirements for stormwater treatment facilities and flow-control (hydromodification management) requirements.

#### ► SIZING REQUIREMENTS FOR STORMWATER TREATMENT FACILITIES

The guidance in Chapter 4 was crafted to ensure LID facilities comply with the NPDES permit's hydraulic sizing requirements for stormwater treatment facilities and flow-control facilities. The technical background follows.

Most runoff is produced by frequent storms of small or moderate intensity and duration. Treatment facilities are designed to treat smaller storms and the first flush of larger storms—approximately 80% of average annual runoff.

The NPDES permit identifies two types of treatment facilities—volume-based and flow-based.

Volume-based facilities must be designed to infiltrate, filter, or treat the volume of runoff produced from a 24-hour 85<sup>th</sup> percentile storm event as determined from the County of San Diego's 85<sup>th</sup> Percentile Precipitation Isopluvial Map. As shown on the map, rainfall depths vary from about 0.55" to 1.55".

For flow-based facilities, the NPDES permit specifies the rational method be used to determine flow. The rational method uses the equation

$Q = CiA$ , where

$Q$  = flow

$C$  = weighted runoff factor between 0 and 1

$i$  = rainfall intensity

$A$  = area

The permit identifies two alternatives for calculating rainfall intensity:

1. the 85th percentile rainfall intensity times two, or
2. 0.2 inches per hour.

It is typically found that both methods yield similar results. The 0.2 inches per hour rainfall intensity should be used for sizing flow-based treatment facilities within the County's jurisdiction.

The 0.2 inches per hour criterion is the basis for a consistent countywide sizing factor for bioretention facilities when used for stormwater treatment only (i.e., not for flow control). The factor is based on maintaining a minimum percolation rate of 5 inches per hour through the engineered soil mix. The sizing factor is the ratio of the design intensity of rainfall on tributary impervious surfaces (0.2 inches/hour) to the design percolation rate in the facility (5 inches/hour), or 0.04 (dimensionless).

► FLOW-CONTROL (HYDROMODIFICATION MANAGEMENT)

The NPDES permit specifies for applicable projects:

... post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in flow rates and durations.

Under current Interim Hydromodification Criteria, the requirement applies to projects disturbing 50 acres or more, and applicants may select among three options for compliance: Use a continuous simulation model to compare pre-project and post-project runoff, use LID facilities with sizing factors and design criteria developed by the Copermittees, or identify a specified exemption. See Chapter One.

The technical background for the Interim Hydromodification Criteria is in the memorandum "Development of Interim Hydromodification Criteria" (October 30, 2007) and other technical documents available on the Project Clean Water website.

Hydromodification management criteria:

1. Post-construction peak run-off flow rates and velocities from the project site shall be maintained at levels that will not cause a significant increase in downstream erosion.
2. Measures to control flow rates and velocities shall not disrupt flows and flow patterns that are necessary to support downstream wetlands or riparian habitats. Diversion of run-off to regional facilities shall not be allowed to deprive immediate downstream habitats of the necessary natural low flows levels experienced during the dry weather season or over-bank flow events.
3. Hardening natural downstream areas to prevent erosion is prohibited, except where pre-development conditions are shown, to the satisfaction of the County, to be so erosive that hardening would be required even in the absence of the proposed development.

4. Interim hydromodification criteria for priority development projects disturbing 50 or more acres.
  - Estimated post-project run-off durations and peak flows shall not exceed pre-project durations and peak flows.
  - The project proponent must use a continuous simulation hydrologic computer model such as US EPA's Hydrograph Simulation Program-Fortran (HSPF) to simulate pre-project and post-project run-off, including the effect of proposed BMPs, detention basins, or other stormwater management facilities utilizing the entire rainfall record, and shall show the following criteria are met:
    - i. For flow rates from 20% of the pre-project 5-year run-off event (0.2Q5) to the pre-project 10-year run-off event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over more than 10% of the length of the flow duration curve.
    - ii. For flow rates from 0.2Q5 to Q5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q5 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10.
  - Priority development projects disturbing 50 acres or more are exempt from the requirements of section 67.812(b)(4) if:
    - i. The project would discharge into channels that are concrete-lined or significantly hardened, such as with rip-rap or sackcrete, downstream to their outfall in bays or the ocean.
    - ii. The project would discharge into underground storm drains discharging directly to bays or the ocean.
    - iii. The project would discharge to a channel where the watershed areas below the project's discharge points are highly impervious (>70%).
    - iv. The project proponent conducts an assessment incorporating sediment transport modeling across the range of geomorphically- significant flows that demonstrates to the County's satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water.



## Criteria for Infiltration Devices

The NPDES permit restricts the design and location of “infiltration devices” that, as designed, may bypass filtration through surface soils before reaching groundwater. These devices include:

- Infiltration basins.
- Infiltration trenches (includes French drains).
- Unlined retention basins (i.e., basins with no outlets).
- Unlined or open-bottomed vaults or boxes installed below grade (dry wells).

Infiltration devices may not be used in:

- Areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway);
- Automotive repair shops;
- Car washes;
- Fleet storage areas (bus, truck, etc.);
- Nurseries;
- Other areas with pollutant sources that could pose a threat to groundwater, as designated by each Permittee.

The vertical distance from the base of any infiltration device to the seasonal high groundwater mark shall be at least 10 feet. Infiltration devices shall be located a minimum of 100 feet horizontally from any known water supply wells.

In addition, infiltration devices are not recommended where:

- The infiltration device would receive drainage from areas where chemicals are used or stored, where vehicles or equipment are washed, or where refuse or wastes are handled.
- Surface soils or groundwater are polluted.
- The facility could receive sediment-laden runoff from disturbed areas or unstable slopes.
- Increased soil moisture could affect the stability of slopes of foundations.
- Soils are insufficiently permeable to allow the device to drain within 96 hours.

► MOST LID FEATURES AND FACILITIES ARE NOT INFILTRATION DEVICES

Self-treating and self-retaining areas, pervious pavements, bioretention facilities, and planter boxes are not considered to be infiltration devices.

Bioretention facilities work by percolating runoff through 18 inches or more of engineered soil. This removes most pollutants before the runoff is allowed to seep into native soils below. Further pollutant removal typically occurs in the unsaturated (vadose) zone before moisture reaches groundwater.

Where there is concern about the effects of increased soil moisture on slopes or foundations, an impermeable barrier may be added so the facility is “flow through” and all treated runoff is underdrained away from the facility. See the design sheets for Bioretention Facilities and Flow-Through Planters in Chapter 4.

## Environmental and Economic Benefit Perspective

The San Diego Region has varied topography consisting of coastal plain, central mountain-valley, and eastern mountain valley areas. Elevations range from sea level at the Pacific Ocean to approximately 6,000 feet at the summit of Palomar Mountain. Temperature averages about 65 degrees Fahrenheit and average annual precipitation is between 10 and 13 inches.

San Diego County comprises 10 major stream systems: San Onofre Creek, Santa Margarita River, San Luis Rey River, San Marcos Creek, Escondido Creek, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Almost all stream systems in the San Diego region have both perennial and ephemeral reaches. In addition, most of these streams have been impacted by impoundments and/or channelization. There are few undisturbed stream reaches left in San Diego County.

San Diego County is approximately 2.7 million acres and roughly 1.8 million acres (66 percent) is developed or in use. Much of the remaining land is preserved from future development.

Impervious surfaces now cover much of the land, and storm drains pipe runoff from urban areas directly into streams. As in many of California’s urban areas, growth and development have caused changes in the timing and intensity of stream flows. These changes can then lead to more frequent flooding, destabilized stream banks, armoring of streambanks with riprap and concrete, loss of streamside trees and vegetation, and the destruction of stream habitat.

The remaining habitat in the region is composed of sensitive coastal sage scrub, chaparral, woodlands, and grasslands. Human encroachment and habitat loss threaten close to 300 species of plants and animals in California. Many of those reside in southern California and range from native grasslands to the Fairy Shrimp.

Once altered, natural streams and their ecosystems cannot be fully restored. However, it is possible to stop, and partially reverse, the trend of declining habitat and preserve some ecosystem values for the benefit of future generations.

This is an enormous, long-term effort. Managing runoff from a single development site may seem inconsequential, but by changing the way most sites are developed (and redeveloped), we may be able to preserve and enhance existing stream ecosystems in urban and urbanizing areas.

References and Resources:

- [RWQCB Order R9-2007-0001 \(Stormwater NPDES Permit\)](#)
- [County of San Diego Low Impact Development Handbook](#)
- [Clean Water Act Section 402\(p\)](#)
- [40 CFR 122.26](#)
- [San Diego Regional Water Quality Control Board—TMDLs](#)
- [State Water Resources Control Board—Ocean Standards](#)
- [Site Planning for Urban Stream Protection](#) (Scheuler, 1995).
- [“Application of Water-Quality Engineering Fundamentals to the Assessment of Stormwater Treatment Devices”](#) (Salvia, 2000).

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## Preparing Your Project Submittal

*Step-by-step assistance to demonstrate compliance.*

Your Project Submittal will demonstrate your project complies with all applicable requirements in the stormwater NPDES permit—to minimize imperviousness, retain or detain stormwater, slow runoff rates, incorporate required source controls, treat stormwater prior to discharge, control runoff rates and durations, and provide for operation and maintenance of treatment and flow-control facilities.

Typically, your SWMP must be coordinated with your application for discretionary approvals and must have sufficient detail to ensure the stormwater design, site plan, and landscaping plan are congruent.

A complete and thorough SWMP will facilitate quicker review and fewer cycles of review. The County requires a submittal for every applicable project.

The County requires a SWMP submittal for SUSMP projects and a SWMP template is provided in Appendix C. County staff may use a checklist such as the following example to evaluate your SWMP:

## EXAMPLE SWMP CHECKLIST

## CONTENTS OF EXHIBIT

Show all of the following on drawings:

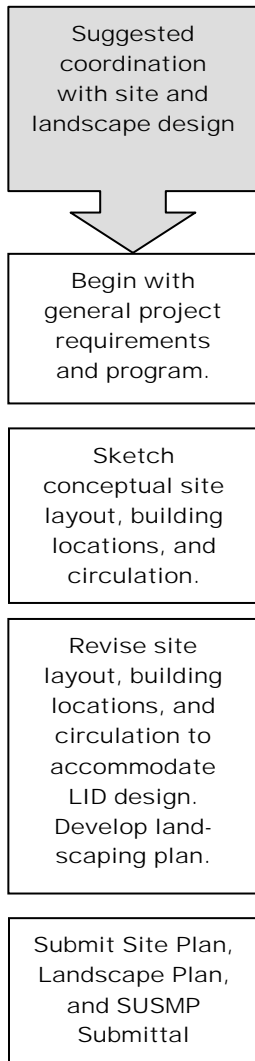
- ☐ Existing natural hydrologic features (depressions, watercourses, floodplains, relatively undisturbed areas) and significant natural resources. (Step 1 in the following step-by-step instructions)
- ☐ Soil types and depth to groundwater. (Step 1)
- ☐ Existing and proposed site drainage network and connections to drainage off-site. (Step 3)
- ☐ Proposed design features and surface treatments used to minimize imperviousness. (Step 3)
- ☐ Entire site divided into separate drainage areas, with each area identified as self-treating, self-retaining (zero-discharge), draining to a self-retaining area, or draining to an IMP. (Step 3)
- ☐ For each drainage area, types of impervious area proposed (roof, plaza/sidewalk, and streets/parking) and area of each. (Step 3)
- ☐ Proposed locations and sizes of treatment or flow-control facilities. (Step 3)
- ☐ Potential pollutant source areas, including refuse areas, outdoor work and storage areas, etc. listed in the Appendix E and corresponding required source controls. (Step 4)

## CONTENTS OF REPORT

Include all of the following in a report:

- ☐ Narrative analysis or description of site features and conditions that constrain, or provide opportunities for, stormwater control. (Step 2)
- ☐ Narrative description of site design characteristics that protect natural resources. (Step 3)
- ☐ Narrative description and/or tabulation of site design characteristics, building features, and pavement selections that reduce imperviousness of the site. (Step 3)
- ☐ Tabulation of proposed pervious and impervious area, showing self-treating areas, self-retaining areas, and areas tributary to each treatment or flow-control facility. (Step 3)
- ☐ Preliminary designs, including calculations, for each infiltration, treatment, or flow-control facility. Elevations should show sufficient hydraulic head for each. (Step 3)
- ☐ A table of identified pollutant sources and for each source, the source control measure(s) used to reduce pollutants to the maximum extent practicable. See worksheet in the Appendix E. (Step 4)
- ☐ General maintenance requirements for infiltration, treatment, and flow-control facilities (Step 5)
- ☐ Means by which facility maintenance will be financed and implemented in perpetuity. (Step 5)
- ☐ Statement accepting responsibility for interim operation & maintenance of facilities (Step 5).
- ☐ Identification of any conflicts with codes or requirements or other anticipated obstacles to implementing the proposed facilities in the submittal (Step 6).
- ☐ Construction Plan SUSMP Checklist (Step 6).
- ☐ Certification by a civil engineer, architect, and landscape architect (Step 6).

## Step by Step



Plan and design your stormwater controls integrally with the site planning and landscaping for your project. It's best to start with general project requirements and preliminary site design concepts, then prepare the detailed site design, landscape design, and stormwater control design simultaneously. This will help ensure that your site plan, landscape plan, and SWMP are congruent.

The following step-by-step procedure should optimize your design by identifying the best opportunities for stormwater controls early in the design process.

The recommended steps are:

1. Assemble needed information.
2. Identify site opportunities and constraints.
3. Follow the LID design guidance in Chapter 4 to analyze your project for LID and to develop and document your drainage design.
4. Specify source controls using the sources/source control checklist in the Appendix E.
5. Plan for ongoing maintenance of treatment and flow-control facilities.
6. Complete the SWMP.

County staff may recommend you prepare and submit a preliminary site design prior to formally applying for planning and zoning approvals. Your preliminary site design should incorporate a conceptual plan for site drainage, including self-treating and self-retaining areas and the location and approximate sizes of any treatment facilities. This additional up-front design effort will save time and avoid potential delays later in the review process.

## Step 1: Assemble Needed Information

To select types and locations of treatment facilities, the designer needs to know the following site characteristics:

- Existing natural hydrologic features and natural resources, including any contiguous natural areas, wetlands, watercourses, seeps, or springs.

- Existing site topography, including contours of any slopes of 4% or steeper, general direction of surface drainage, local high or low points or depressions, any outcrops or other significant geologic features.
- Zoning, including requirements for setbacks and open space.
- Public Works Standards or other local codes governing minimum street widths, sidewalk construction, allowable pavement types, and drainage. These codes may conflict with Low Impact Development objectives to minimize imperviousness and to maintain or restore natural site hydrology. The County will review and revise codes to resolve these conflicts where it is possible to do so.
- Soil types (including hydrologic soil groups) and depth to groundwater, which may determine whether infiltration is a feasible option for managing site runoff. Depending on site location and characteristics, and on the selection of treatment and flow-control facilities, site-specific information (e.g. from boring logs or geotechnical studies) may be required.
- Existing site drainage. For undeveloped sites, this should be obtained by inspecting the site and examining topographic maps and survey data. For previously developed sites, site drainage and connection to the municipal storm drain system can be located from site inspection, municipal storm drain maps, and plans for previous development.
- Existing vegetative cover and impervious areas, if any.

#### References and Resources

- [\*Site Planning for Urban Stream Protection\*](#) (Scheuler 1995).
- [\*Start at the Source\*](#) (BASMAA 1999), p. 36

## Step 2: Identify Constraints & Opportunities

Review the information collected in Step 1. Identify the principal constraints on site design and selection of treatment and flow-control facilities as well as opportunities to reduce imperviousness and incorporate facilities into the site and landscape design. For example, constraints might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, restricted right-of-way, or safety concerns. Opportunities might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention facilities), and differences in elevation (which can provide hydraulic head). Note stormwater treatment facilities should not be located within protected riparian areas.

Prepare a brief narrative describing site opportunities and constraints. This narrative will help you as you proceed with LID design and explain your design decisions to others.



## Step 3: Prepare and Document Your LID Design

Use the Low Impact Development Design Guide (Chapter 4) to analyze your project for LID, design and document drainage, and specify preliminary design details for integrated management practices. Follow the detailed instructions in Chapter 4 to ensure your project complies with NPDES permit LID requirements (Provision D.1.d.(4)) as well as stormwater treatment requirements in Provision D.1.d.(6)). In future editions of this SUSMP, the LID Design Guide will be updated so that additional hydromodification management requirements are also met via this unified design procedure. Chapter 4 includes calculation procedures and formats for presenting your calculations.

As shown in the example checklist (page 38), your SWMP may need to include a drawing showing:

- The entire site divided into separate drainage management areas (DMAs), with each area identified as one of the following: self-treating, self-retaining, draining to a self-retaining area, or draining to an IMP. Each area should be clearly marked with a unique identifier.
- For each drainage area, the types of impervious area proposed, and the area of each.
- Proposed locations and sizes of treatment facilities. Each facility should be clearly marked with a unique identifier.

**Compliance**  
The design criteria for DMAs in Chapter 4 ensure the required volume of flow from all developed portions of the project, including landscaped areas, is infiltrated, filtered, or treated (Provision D.1.d.(6)(a)).

Your SWMP may need to include:

- Tabulation of proposed self-treating areas, self-retaining areas, areas draining to self-retaining areas, and areas draining to IMPs, and the corresponding IMPs identified on the Exhibit.
- Calculations, in the format shown in Chapter 4, showing the minimum square footage required and proposed square footage for each IMP.
- Preliminary designs for each IMP. The design sheets and accompanying drawings in Chapter 4 may be used or adapted for this purpose.

The following may also be required, or may be advisable to assist the reviewer to understand your design:

- A narrative overview of your design and how your design decisions optimize the site layout, use pervious surfaces, disperse runoff from impervious surfaces, and drain impervious surfaces to engineered IMPs. See Chapter 4.
- A narrative briefly describing each drainage management area (DMA), its drainage, and where drainage will be directed.

- A narrative briefly describing each IMP. Include any special characteristics or features distinct from the design sheets in Chapter 4.

#### References and Resources

- [Chapter 4](#)
- *County of San Diego Low Impact Development Handbook*
- Your municipality's *General Plan*
- Your municipality's Zoning Ordinance and Development Codes
- *Low Impact Development Manual* (Prince George's County, Maryland, 1999).
- *Bioretention Manual* (Prince George's County, Maryland, rev. 2002)
- *Site Planning for Urban Stream Protection* (Schueler, 1995b).
- *Low Impact Development Technical Guidance Manual for Puget Sound* (Puget Sound Action Team, 2005)
- *LID for Big Box Retailers* (Low Impact Development Center, 2006)

## Step 4. Specify Source Control BMPs

Some everyday activities – such as trash recycling/disposal and washing vehicles and equipment – generate pollutants that tend to find their way into storm drains. These pollutants can be minimized by applying source control BMPs.

Source control BMPs include permanent, structural features that must be incorporated into your project plans and operational BMPs, such as regular sweeping and “housekeeping,” that must be implemented by the site’s occupant or user. The maximum extent practicable standard typically requires both types of BMPs. In general, operational BMPs cannot be substituted for a feasible and effective permanent BMP.

Use the following procedure to specify source control BMPs for your site:

#### ► IDENTIFY POLLUTANT SOURCES

Review the first column in the Pollutant Sources/Source Control Checklist (Appendix E). Check off the potential sources of pollutants that apply to your site.

#### ► NOTE LOCATIONS ON SUBMITTAL DRAWING

Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist (Appendix E). Show the location of each pollutant source and each permanent source control BMP in your submittal drawing.

#### ► PREPARE A TABLE AND NARRATIVE

Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist (Appendix E). Now, create a table using the format in Table 3-1. In the left column, list each potential source on your site (from Appendix E, Column 1). In the middle column, list the corresponding permanent, structural BMPs (from Columns 2 and 3, Appendix E) used to prevent pollutants from entering runoff. Accompany this table with a narrative that explains any special features, materials, or methods of construction that will be used to implement these permanent, structural BMPs.

## ► IDENTIFY OPERATIONAL SOURCE CONTROL BMPS

TABLE 3-1. Format for table of permanent and operational source control measures.

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>

To complete your table, refer once again to the Pollutant Sources/Source Control Checklist (Appendix E, Column 4). List in the right column of your table the operational BMPs that should be implemented as long as the anticipated activities continue at the site. The same BMPs may also be required as a condition of a use permit or other revocable discretionary approval for use of the site.

## References and Resources

- [Appendix E: Stormwater Pollutant Sources/Source Control Checklist](#)
- RWQCB Order R9-2007-0001, Provision D.1.d.(5)
- [Start at the Source](#), Section 6.7: Details, Outdoor Work Areas
- [California Stormwater Industrial/Commercial Best Management Practice Handbook](#)
- *Urban Runoff Quality Management* (WEF/ASCE, 1998) Chapter 4: Source Controls

## Step 5: Stormwater Facility Maintenance

As required by NPDES Permit Provision D.1.c.(5), the County will require submittal of proof of a mechanism under which ongoing long-term maintenance of stormwater treatment and flow-control facilities will be conducted. The County may require one of more of the following items be included in your SWMP:

1. A means to finance and implement facility maintenance in perpetuity.
2. Acceptance of responsibility for maintenance from the time the facilities are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the treatment and flow-control facilities you have selected.

The County may also require that you prepare and submit a detailed plan that sets forth a maintenance schedule for each of the treatment and flow-control facilities built on your site.

Details of these requirements, and instructions for preparing a detailed operation and maintenance plan, are in Chapter 5.

## References and Resources

- [Chapter 5](#)
- Operation, Maintenance, and Management of Stormwater Management Systems (Watershed Management Institute, 1997)

## Step 6: Complete Your SWMP

County staff will provide specific instructions for the content and format of your SWMP. Your SWMP should document the information gathered and decisions made in Steps 1-5. A clear, complete, well-organized SWMP will make it possible to confirm your design meets the minimum requirements of the NPDES permit, the WPO, and this *SUSMP*.

## ► COORDINATION WITH SITE, ARCHITECTURAL, AND LANDSCAPING PLANS

Before completing your SWMP, ensure your stormwater control design is fully coordinated with the site plan, grading plan, and landscaping plan being proposed for the site.

Information submitted and presentations to design review committees, planning commissions, and other decision-making bodies must incorporate relevant aspects of the stormwater design. In particular, ensure:

- Curb elevations, elevations, grade breaks, and other features of the drainage design are consistent with the delineation of DMAs.
- The top edge (overflow) of each bioretention facility is level all around its perimeter—this is particularly important in parking lot medians.
- The resulting grading and drainage design is consistent with the design for parking and circulation.
- Bioretention facilities and other IMPs do not create conflicts with pedestrian access between parking and building entrances.
- Vaults and utility boxes can be accommodated outside bioretention facilities and will not be placed within bioretention facilities.
- The visual impact of stormwater facilities, including planter boxes at building foundations and any terracing or retaining walls required for the stormwater control design, is shown in renderings and other architectural drawings.
- Landscaping plans, including planting plans, show locations of bioretention facilities and other IMPs, and the plant requirements are consistent with the engineered soils and conditions in the bioretention facilities.
- Renderings and representation of street views incorporate any stormwater facilities located in street-side buffers and setbacks

## ► CONSTRUCTION PLAN SUSMP CHECKLIST

When you submit construction plans for County review and approval, the reviewer will compare that submittal with your earlier SWMP. By creating a Construction Plan SWMP Checklist for your project, you can facilitate the reviewer's comparison and speed review of your project. Table 3-2 shall be placed on all project plans that have treatment control and LID BMPs.

TABLE 3-2. Format for Construction Plan SUSMP Checklist.

Stormwater Treatment Control and LID BMP's			
Description / Type	Sheet	Maintenance Category	Revisions

\* BMP's approved as part of Stormwater Management Plan (SWMP) dated xx/xx/xx on file with DPW. Any changes to the above BMP's will require SWMP revision and Plan Change approvals.

Here's how:

1. Create a table similar to Table 3-2. Number and list each measure or BMP you have specified in your SWMP in Columns 1 and Maintenance Category in Column 3 of the table. Leave Column 2 blank. Incorporate the table into your SWMP.
2. When you submit construction plans, duplicate the table (by photocopy or electronically). Now fill in Column 2, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. Submit the updated table with your construction plans.

Note that the updated table—or Construction Plan SUSMP Checklist—is only a reference tool to facilitate comparison of the construction plans to your SWMP. Planning Department staff can advise you regarding the process required to propose changes to your approved SWMP.

## ► CERTIFICATION

The County requires that your SWMP be certified by a civil engineer.

The certification states: "The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan have been prepared under the direction of the following Registered Civil Engineer and meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments."

► SWMP OUTLINE AND CONTENTS

SWMP outline and contents are provided in the Major SWMP (Appendix C).

► EXAMPLE SWMPS

Example SWMPs may be available from staff at the County. Your submittal will reflect the unique character of your own project and should meet the requirements identified in this *SUSMP*. County staff can assist you to determine how specific requirements apply to your project.

## Low Impact Development Design Guide

*Guidance for designing and documenting your LID site drainage, stormwater treatment facilities, and flow-control facilities*

Follow the Low Impact Development (LID) design in this SUSMP to achieve compliance with the stormwater treatment requirements as well as the LID requirements in the stormwater NPDES permit.

This will require careful documentation of:

- Pervious and impervious areas in the planned project.
- Drainage from each of these areas.
- Locations, sizes, and types of proposed treatment facilities.

Your SWMP must include calculations showing the site drainage and proposed LID treatment facilities meet the criteria in this *SUSMP*.

This Low Impact Development Design Guide will help you:

- Analyze your project and identify and select options for implementing LID techniques to meet runoff treatment requirements—and flow-control requirements, if they apply.
- Design and document drainage for the whole site and document how that design meets this *SUSMP*'s stormwater treatment criteria.
- Specify preliminary design details and integrate your LID drainage design with your paving and landscaping design.

Alternatives to LID design are discussed in the final section of this chapter.

## Analyze Your Project for LID

Conceptually, there are four LID strategies for managing runoff from buildings and paving:

1. Optimize the site layout by preserving natural drainage features and designing buildings and circulation to minimize the amount of roofs and paving.
2. Use pervious surfaces such as turf, gravel, or pervious pavement—or use surfaces that retain rainfall, such as vegetated roofs. All drainage from these surfaces is considered to be “self-retained” (a detailed definition corresponding to this concept is on page 54). No further management of runoff is necessary. An emergency overflow should be provided for extreme events.
3. Disperse runoff from impervious surfaces on to adjacent pervious surfaces (e.g., direct a roof downspout to disperse runoff onto a lawn).
4. Drain impervious surfaces to engineered Integrated Management Practices (IMPs), such as bioretention facilities, planter boxes, cisterns, or dry wells. IMPs infiltrate runoff to groundwater and/or percolate runoff through engineered soil and allow it to drain away slowly. Depending on site conditions and local regulations, it may be possible to harvest and reuse rainwater in conjunction with IMPs.

A combination of two or more strategies may work best for your project. With forethought in design, the four strategies can provide multiple, complementary benefits to your development. Pervious surfaces reduce heat island effects and temperature extremes. Landscaping improves air quality, creates a better place to live or work, and upgrades value for rental or sale. Retaining natural hydrology helps preserve and enhance the natural character of the area. LID drainage design can also conserve water and reduce the need for drainage infrastructure.

Table 4-1 includes ideas for applying LID strategies to site conditions and types of development.



TABLE 4-1. Ideas for Runoff Management

<i>Site Features and Design Objectives</i>	<i>Vegetated Roof</i>	<i>Self-retaining Areas</i>	<i>Pervious Pavement</i>	<i>Bioretention Facility</i>	<i>Flow-through Planter</i>	<i>Dry Well</i>	<i>Cistern with bioretention</i>
Clayey native soils	✓			✓	✓		✓
Permeable native soils	✓		✓	✓	✓	✓	
Very steep slopes	✓				✓		
Shallow groundwater	✓				✓		
Avoid saturating subsurface soils	✓		✓		✓		
Connect to roof downspouts		✓		✓	✓	✓	✓
Parking lots/islands and medians			✓	✓		✓	
Sites with extensive landscaping		✓	✓	✓			
Densely developed sites with limited space/landscape	✓		✓		✓	✓	✓
Fit IMPs into landscape and setback areas				✓			✓
Make drainage a design feature		✓		✓			✓
Convey as well as treat stormwater				✓			

## ► OPTIMIZE THE SITE LAYOUT

To minimize stormwater-related impacts, apply the following design principles to the layout of newly developed and redeveloped sites.

Conserve natural areas, soils, and vegetation. Define the development envelope and protected areas, identifying areas that are most suitable for development and areas that should be left undisturbed. Use the following guideline to determine the least sensitive areas of the site, in order of increasing sensitivity:

1. Areas devoid of vegetation, including previously graded areas and agricultural fields.
2. Areas of non-native vegetation, disturbed habitats and eucalyptus woodlands where receiving waters are not present.
3. Areas of chamise or mixed chaparral, and non-native grasslands.
4. Areas containing coastal scrub communities.
5. All other upland communities.
6. Occupied habitat of sensitive species and all wetlands (as both are defined by the local jurisdiction).

Within each of the previous categories, hillside areas should be considered more sensitive than flatter areas.

**Coordination**  
Chapter One includes a presentation of how review of your project's site design and landscape design is coordinated with review for compliance with stormwater NPDES requirements.

Where possible, conform the site layout along natural landforms, avoid excessive grading and disturbance of vegetation and soils, and replicate the site's natural drainage patterns. Set back development from creeks, wetlands, and riparian habitats. Preserve significant trees, especially native trees and shrubs, and identify locations for planting additional native or drought tolerant trees and large shrubs. Concentrate development on portions of the site with less permeable soils, and preserve areas that can promote infiltration.

For all types of development, limit overall coverage of paving and roofs. Where allowed by local zoning and design standards—and provided public safety and a walkable environment are not compromised—this can be accomplished by designing compact, taller structures, narrower and shorter streets and sidewalks, smaller parking lots (fewer stalls, smaller stalls, and more efficient lanes), and indoor or underground parking. Examine site layout and circulation patterns and identify areas where landscaping can be substituted for pavement.

Detain and retain runoff throughout the site. On flatter sites, it typically works best to intersperse landscaped areas and IMPs among the buildings and paving. On hillside sites, drainage from upper areas may be collected in conventional catch basins and piped to landscaped areas and IMPs in lower areas.

Use drainage as a design element. Use depressed landscape areas, vegetated buffers, and bioretention areas as amenities and focal points within the site and landscape design. Bioretention areas can be almost any shape and should be located at low points. Bioretention areas shaped as swales can detain and treat low runoff flows and also convey higher flows.

► USE PERVIOUS SURFACES

Consider a vegetated roof. Although not yet widely used in California, vegetated or “green” roofs are growing in popularity. Potential benefits include longer roof life, lower heating and cooling costs, and better sound insulation, in addition to air quality and water quality benefits. For SUSMP compliance purposes, vegetated roofs are considered not to produce increased runoff or runoff pollutants (i.e., any runoff from a vegetated roof requires no further treatment or detention). For more information on vegetated roofs, see [www.greenroofs.org](http://www.greenroofs.org).

Consider permeable pavements and surface treatments. Inventory paved areas on your preliminary site plan. Identify where permeable pavements, such as crushed aggregate, turf block, unit pavers, pervious concrete, or pervious asphalt could be substituted for impervious concrete or asphalt paving.

► DISPERSE RUNOFF TO ADJACENT PERVIOUS AREAS

Look for opportunities to direct runoff from impervious areas to adjacent landscaping. The design, including slopes and soils, must reflect a reasonable expectation that an inch of rainfall will soak into the soil and produce no runoff. For example, a lawn or garden depressed 3-4" below surrounding walkways or driveways provides a simple but functional landscape design element.

For sites subject to stormwater treatment requirements only, a 2:1 maximum ratio of impervious to pervious area is acceptable. Be sure soils will drain adequately.

Under some circumstances, it may be allowable to direct runoff from impervious areas to pervious pavement (for example, from roof downspouts to a parking lot paved with crushed aggregate or turf block). The pore volume of pavement and base course must be sufficient to retain an inch of rainfall, including runoff from the tributary area. The slopes and soils must be compatible with infiltrating that volume without producing runoff.

► DIRECT RUNOFF TO INTEGRATED MANAGEMENT PRACTICES

Project Clean Water has developed design criteria for the following IMPs:

- Bioretention facilities, which can be configured as swales, free-form areas, or planters to integrate with your landscape design.
- Flow-through planters, which can be used near building foundations and other locations where infiltration to native soils is not desired.
- Dry wells and other infiltration facilities, which can be used only where soils are permeable.

- Cisterns, in combination with a bioretention facility.

See the design sheets at the end of this chapter.

It may be possible to create a site-specific design that uses cisterns to achieve stormwater flow control, stormwater treatment, and rainwater reuse for irrigation or indoor uses (water harvesting). Such a design could expand the multiple benefits of LID to include water conservation. Keep in mind:

- Facilities must meet criteria for capturing and treating the volume specified by Equation 4-8 below. This volume must be allowed to empty within 24 hours so runoff from additional storms, which may follow, is also captured and treated. Additional volume may be required if the system also stores runoff for longer periods for reuse.
- Storage of water for longer than 48 hours creates the potential for mosquito harborage. Cisterns must be designed to prevent entry by mosquitoes.
- Indoor uses of non-potable water may be restricted or prohibited. Check with County staff.

Some references and resources for water harvesting appear at the end of this chapter.

Finding the right location for treatment facilities on your site involves a careful and creative integration of several factors:

- To make the most efficient use of the site and to maximize aesthetic value, integrate IMPs with site landscaping. Many local zoning codes may require landscape setbacks or buffers, or may specify that a minimum portion of the site be landscaped. It may be possible to locate some or all of your site's treatment and flow-control facilities within this same area, or within utility easements or other non-buildable areas.
- Planter boxes and bioretention areas must be level or nearly level all the way around. Bioretention areas configured as swales may be gently sloped in the linear direction, but opposite sides must be at the same elevation.
- For effective, low-maintenance operation, locate facilities so drainage into and out of the device is by gravity flow. Pumped systems are feasible, but are expensive, require more maintenance, are prone to untimely failure, and can cause mosquito control problems. Most IMPs require 3 feet or more of head.
- If the property is being subdivided now or in the future, the facility should be in a common, accessible area. In particular, avoid locating facilities on private residential lots. Even if the facility will serve only one site owner or operator, make sure the facility is located for ready access by inspectors from the County and local mosquito control agency.

- The facility must be accessible to equipment needed for its maintenance. Access requirements for maintenance will vary with the type of facility selected. Planter boxes and bioretention areas will typically need access for the same types of equipment used for landscape maintenance.

To complete your analysis, include in your SWMP a brief narrative documenting the site layout and site design decisions you made. This will provide background and context for how your design meets the quantitative LID design criteria.

## Develop and Document Your Drainage Design

The design documentation procedure begins with careful delineation of pervious areas and impervious areas (including roofs) throughout the site. The procedure accounts for how runoff from each delineated area is managed. For areas draining to IMPs, the procedure ensures each IMP is appropriately sized.

The procedure results in a space-efficient, cost-efficient LID design for meeting SUSMP requirements on most residential and commercial/industrial developments. The procedure arranges documentation of drainage design and IMP sizing in a consistent format for presentation and review.

This procedure is intended to facilitate, not substitute for, creative interplay among site design, landscape design, and drainage design. Several iterations may be needed to optimize your drainage design as well as aesthetics, circulation, and use of available area for your site.

You should be able to complete the needed calculations using only the project's site development plan.

### ► STEP 1: DELINEATE DRAINAGE MANAGEMENT AREAS

This is the key first step. You must divide the entire project area into individual, discrete Drainage Management Areas (DMAs). Typically, lines delineating DMAs follow grade breaks and roof ridge lines. The Exhibit, tables, text, and calculations in your SWMP will illustrate, describe, and account for runoff from each of these areas.

Use separate DMAs for each surface type (e.g., landscaping, pervious paving, or roofs). Each DMA must be assigned a single hydrologic soil group. Assign each DMA an identification number and determine its size in square feet.

## ► STEP 2: CLASSIFY DMAS AND DETERMINE RUNOFF FACTORS

Next, determine how drainage from each DMA will be handled. Each DMA will be one of the following four types:

1. Self-treating areas.
2. Self-retaining areas (also called “zero-discharge” areas).
3. Areas that drain to self-retaining areas.
4. Areas that drain to IMPs.

Self-treating areas are landscaped or turf areas that do not drain to IMPs, but rather drain directly off site or to the storm drain system. Examples include upslope undeveloped areas

**Rationale**  
Pollutants in rainfall and windblown dust will tend to become entrained in the vegetation and soils of landscaped areas, so no additional treatment is needed. It is assumed the self-treating landscaped areas will produce runoff less than or equal to the pre-project site condition.

which are ditched and drained around a development and grassed slopes which drain off-site to a street or storm drain. In general, self-treating areas include no impervious areas, unless the impervious area is very small (5% or less) in relationship to the receiving pervious area and slopes are gentle enough to ensure runoff will be absorbed into the vegetation and soil. Criteria for self-treating areas are in the design sheet “Self Treating and Self-Retaining Areas” at the end of this chapter.

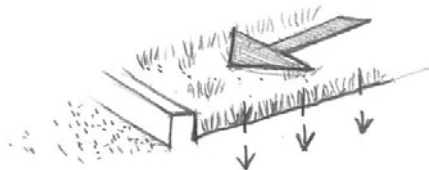


FIGURE 4-1. Self-treating areas are entirely pervious and drain directly off-site or to the storm drain system.

Self-retaining areas are designed to retain the first one inch of rainfall without producing any runoff. The technique works best on flat, heavily landscaped sites. It may be used on mild slopes if there is a reasonable expectation that a one-inch rainfall event would produce no runoff.

To create self-retaining turf and landscape areas in flat areas or on terraced slopes, berm the area or depress the grade into a concave cross-section so that these areas will retain the first inch of rainfall. Specify slopes, if any, toward the center of the pervious area. Inlets of area drains, if any, should be set 3 inches above the low point to allow ponding.

Criteria for self-retaining areas are in the design sheet “Self Treating and Self-Retaining Areas” following this chapter.

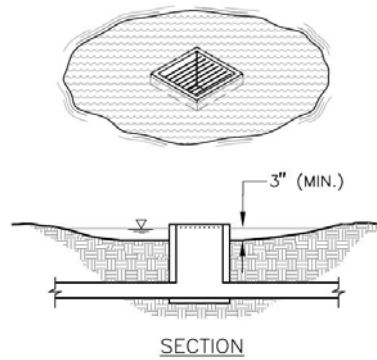


FIGURE 4-2. Self-retaining areas. Berm or depress the grade to retain at least an inch of rainfall and set inlets of any area drains at least 3 inches above low point to allow ponding.

Areas draining to self-retaining areas. Runoff from impervious or partially pervious areas can be managed by routing it to self-retaining pervious areas. For example, roof downspouts can be directed to lawns, and driveways can be sloped toward landscaped areas. The maximum ratio is 2 parts impervious area for every 1 part pervious area.

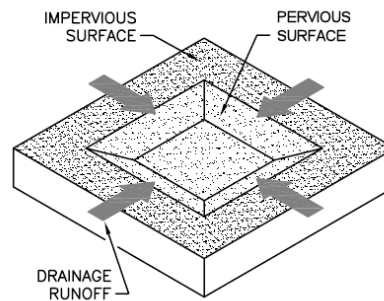


FIGURE 4-3. Relationship of impervious to pervious area for self-retaining areas. Ratio: *pervious*  $\geq \frac{1}{2}$  *impervious*

The drainage from the impervious area must be directed to and dispersed within the pervious area, and the entire area must be designed to retain an inch of rainfall without flowing off-site. For example, if the maximum ratio of 2 parts impervious area into 1 part pervious area is used, then the pervious area must absorb 3 inches of water over its surface before overflowing to an off-site drain to retain an inch of rainfall.

A partially pervious area may be drained to a self-retaining area. For example, a driveway composed of unit pavers may drain to an adjacent lawn. In this case, the maximum ratios are:

$$(\text{Runoff factor}) \times (\text{tributary area}) \leq 2 \times (\text{self-retaining area}) \quad \text{Equation 4-1}$$

Use the runoff factors in Table 4-2.

Prolonged ponding is a potential problem at higher impervious/pervious ratios. In your design, ensure that the pervious area soils can handle the additional run-on and are sufficiently well-drained.

Under some circumstances, pervious pavement (e.g., crushed stone, pervious asphalt, or pervious concrete) can be self-retaining. Adjacent roofs or impervious pavement may drain on to the pervious pavement in the same maximum ratios as described above.

To design a pervious pavement to be a self-treating area, ensure:

- The gravel base course is a minimum of four or more inches deep.
- The base course is not to be underdrained.
- A qualified engineer has been consulted regarding infiltration rates, pavement stability, and suitability for the intended traffic.

Runoff from self-treating and self-retaining areas does not require any further treatment or flow control.

TABLE 4-2. Runoff factors for surfaces draining to IMPs.

Surface	Runoff Factor
Roofs	1.0
Concrete	1.0
Pervious Concrete	0.1
Porous Asphalt	0.1
Grouted Unit Pavers	1.0
Solid Unit Pavers on granular base, min. 3/16 inch joint space	0.2
Crushed Aggregate	0.1
Turfblock	0.1
Amended, mulched soil	0.1
Landscape	0.1

Areas draining to IMPs are multiplied by a sizing factor to calculate the required size of the IMP. On most densely developed sites—such as commercial and mixed-use developments and small-lot residential subdivisions—most DMAs will drain to IMPs.



More than one drainage area can drain to the same IMP. However, because the minimum IMP sizes are determined by ratio to drainage area size, a drainage area may not drain to more than one IMP. See Figures 4-4 and 4-5.

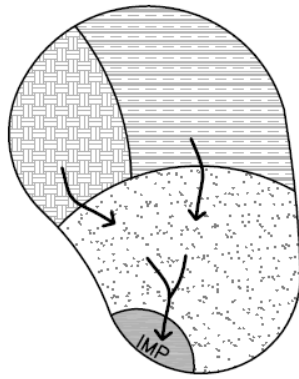


FIGURE 4-4. MORE THAN ONE  
Drainage Management Area can drain to a single  
IMP.

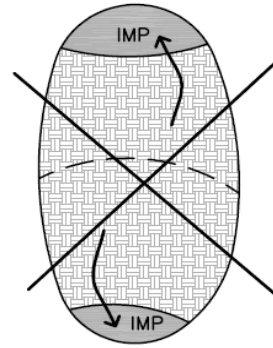


FIGURE 4-5. ONE DRAINAGE  
Management Area cannot drain to more than one IMP.  
Use a grade break to divide the DMA.

Where possible, design site drainage so only impervious roofs and pavement drain to IMPs. This yields a simpler, more efficient design and also helps protect IMPs from becoming clogged by sediment.

If it is necessary to include turf, landscaping, or pervious pavements within the area draining to an IMP, list each surface as a separate DMA. A runoff factor (similar to a “C” factor used in the rational method) is applied to account for the reduction in the quantity of runoff. For example, when a turf or landscaped drainage management area drains to an IMP, the resulting increment in IMP size is:

$$\Delta (\text{Area}) = (\text{pervious area}) \times (\text{runoff factor}) \times (\text{sizing factor}).$$

Use the runoff factors in Table 4-2.

#### ► STEP 3: TABULATE DRAINAGE MANAGEMENT AREAS

- Tabulate self-treating areas in the format shown in Table 4-3.
- Tabulate self-retaining areas in the format shown in Table 4-4.
- Tabulate areas draining to self-retaining areas in the format shown in Table 4-5. Check to be sure the total product of (square feet of tributary area × runoff factor) for all DMAs draining to a receiving self-retaining area is no greater than a 2:1 ratio to the square footage of the receiving self-retaining area itself.
- Compile a list of DMAs draining to IMPs. Proceed to Step 4 to check the sizing of the IMPs.

TABLE 4-3. Format for Tabulating Self-Treating Areas

<i>DMA Name</i>	<i>Area (square feet)</i>

TABLE 4-4. Format for Tabulating Self-Retaining Areas

<i>DMA Name</i>	<i>Area (square feet)</i>

TABLE 4-5. Format for Tabulating Areas Draining to Self-Retaining Areas

<i>DMA Name</i>	<i>Area (square feet)</i>	<i>Post-project surface type</i>	<i>Runoff factor</i>	<i>Receiving self- retaining DMA</i>	<i>Receiving self- retaining DMA Area (square feet)</i>

► STEP 4: SELECT AND LAY OUT IMPS ON SITE PLAN

Select from the list of IMPs in Table 4-6. Illustrations, designs, and design criteria for the IMPs are in the “IMP Design Details and Criteria” at the end of this chapter.

Once you have laid out the IMPs, calculate the square footage you have set aside on your site plan for each IMP.

► STEP 5: REVIEW SIZING FOR EACH IMP

For each of the IMPs, use the appropriate sizing from Table 4-6.

TABLE 4-6. IMP Sizing

Bioretention Facilities	Sizing Factor for Area = 0.04
Flow-through Planters	Sizing Factor for Area = 0.04
Dry Well or Infiltration Basin	See Step 6 to Calculate Min. Volume
Cistern with Bioretention	See Step 6 to Calculate Min. Volume of Cistern; then use 0.04 to calculate minimum size of bioretention area

► STEP 6: CALCULATE MINIMUM AREA AND VOLUME OF EACH IMP

The minimum area of bioretention facilities and flow-through planters is found by summing up the contributions of each tributary DMA and multiplying by the adjusted sizing factor for the IMP.

*Equation 4-7*

$$Min. IMP Area = \sum \begin{pmatrix} DMA & DMA \\ Square & \times Runoff \\ Footage & Factor \end{pmatrix} \times \begin{pmatrix} IMP \\ Sizing \\ Factor \end{pmatrix}$$

DMA = Drainage Management Area

IMP = Integrated Management Practice

Use the format of Table 4-7 to present the calculations of the required minimum area and volumes for bioretention areas and planter boxes:

TABLE 4-7. Format for presenting calculations of minimum IMP Areas for bioretention areas and planter boxes.

DMA Name	DMA Area (square feet)	Post- project surface type	DMA Runoff factor	DMA Area × runoff factor	Soil Type:	IMP Name				
					IMP Sizing factor		Minimum Area	Proposed Area		
Total					0.04					IMP Area

To size dry wells, infiltration basins, or infiltration trenches, use the following procedure:

1. Use the County of San Diego's 85th Percentile Isopluvial Map to determine the minimum unit volume.
2. Determine the weighted runoff factor ("C" factor) for the area tributary to the facility. The factors in Table 4-2 may be used.
3. Multiply the weighted runoff factor times the tributary area times the minimum unit volume.

*Equation 4-8*

$$\text{Volume} = [\text{Tributary Area}] \times [\text{weighted runoff factor}] \times [\text{unit volume}]$$

4. Select a facility depth.
5. Determine the required facility area. Dry wells may be designed as an open vault or with rock fill. If rock fill is used, assume a porosity of 40%.
6. Ensure the facility can infiltrate the entire volume within 96 hours.

To size a cistern in series with a bioretention facility:

1. Use Equation 4-8 to calculate the required cistern volume.
2. Design a discharge orifice for a drawdown time of 24 hours.
3. Determine the maximum discharge from the orifice.
4. The minimum area of the bioretention facility must treat this flow based on a percolation rate of 5" per hour through the engineered soil.

► STEP 7: DETERMINE IF AVAILABLE SPACE FOR IMP IS ADEQUATE

Sizing and configuring IMPs may be an iterative process. After computing the minimum IMP area using Steps 1 – 6, review the site plan to determine if the reserved IMP area is sufficient. If so, the planned IMPs will meet the SUSMP sizing requirements. If not, revise the plan accordingly. Revisions may include:

- Reducing the overall imperviousness of the project site.
- Changing the grading and drainage to redirect some runoff toward other IMPs which may have excess capacity.
- Making tributary landscaped DMAs self-treating or self-retaining.
- Expanding IMP surface area.

► STEP 8: COMPLETE YOUR SUMMARY REPORT

Present your IMP sizing calculations in tabular form. Adapt the following format as appropriate to your project. Coordinate your presentation of DMAs and calculation of minimum IMP sizes with the SWMP drawing (labeled to show delineation of DMAs and locations of IMPs). It is also helpful to incorporate a brief description of each DMA and each IMP.

Sum the total area of all DMAs and IMPs listed and show it is equal to the total project area. This step may include adjusting the square footage of some DMAs to account for area used for IMPs.

*Format:*

Project Name:

Project Location:

APN or Subdivision Number:

Total Project Area (square feet):

Mean Annual Precipitation at Project Site:

## I. Self-treating areas:

<i>DMA Name</i>	<i>Area (square feet)</i>

## II. Self-retaining areas:

<i>DMA Name</i>	<i>Area (square feet)</i>

## III. Areas draining to self-retaining areas:

<i>DMA Name</i>	<i>Post-project surface type</i>	<i>Runoff factor</i>	<i>Area (square feet)</i>	<i>Receiving self-retaining DMA</i>	<i>Receiving self-retaining DMA Area (square feet)</i>

## IV. Areas draining to IMPs (repeat for each IMP):

<i>DMA Name</i>	<i>DMA Area (square feet)</i>	<i>Post-project surface type</i>	<i>DMA Runoff factor</i>	<i>DMA Area × runoff factor</i>	<i>Soil Type:</i>	<i>IMP Name</i>		
					<i>IMP Sizing factor</i>	<i>Minimum Area or Volume</i>	<i>Proposed Area or Volume</i>	
<b>Total</b>								<b>IMP Area</b>

## Specify Preliminary Design Details

In your SWMP, describe your IMPs in sufficient detail to demonstrate the area, volume, and other criteria of each can be met within the constraints of the site.

Ensure these details are consistent with preliminary site plans, landscaping plans, and architectural plans submitted with your application for planning and zoning approvals.

Following are design sheets for:

- Self-treating and self-retaining areas
- Pervious pavements
- Bioretention facilities
- Flow-through planter
- Dry wells and infiltration basins
- Cistern with bioretention facility

These design sheets include recommended configurations and details, and example applications, for these IMPs. The information in these design sheets must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head. Designated County staff have final review and approval authority over the project design.

Keep in mind that proper and functional design of the IMP is the responsibility of the applicant. Effective operation of the IMP throughout the project's lifetime will be the responsibility of the property owner.

## Alternatives to Integrated LID Design

If you believe design of features and facilities as described above is infeasible for your development site, consult with County staff before preparing an alternative design for stormwater treatment, flow control, and LID compliance.

For all alternative designs, the applicant must prepare a complete SWMP, including a drawing showing the entire site divided into discrete Drainage Management Areas, text and tables showing how drainage is routed from each DMA to a treatment facility, and calculations demonstrating the design achieves the applicable design criteria for each stormwater treatment facility. Alternative treatment facilities are limited to the circumstances and selection criteria identified beginning on page 26. The SWMP must also show how the project meets the minimum LID criteria (page 29) and ensures runoff rates, durations, and velocities are controlled to maintain or reduce downstream erosion conditions and protect stream habitat

(NPDES Permit Provision D.1.d.(10)). Alternative treatment facilities shall have high or medium removal efficiencies (see Table 2-3) for the primary pollutants of concern. The primary pollutants of concern are defined as pollutants anticipated from the development category (Table 2-1) that are also listed or proposed to be listed on the 303d list for the receiving water body to which the site drains (page 21).

#### ► DESIGN OF ALTERNATIVE TREATMENT FACILITIES

Here are criteria and design considerations for some alternative treatment facilities:

**Sand Filters.** To ensure effectiveness is not compromised by compacting or clogging of the filter surface, sand filters must be maintained frequently.

The following criteria apply to sand filters:

- Calculate the design flow using the rational method with an intensity of 0.2"/hour and the "C" factors for "treatment only" from Table 4-2.
- To determine the required filter surface area, divide the design flow by an allowable design surface loading rate of 5"/hour.
- The minimum depth of filter media is 18". The media should be washed sand, with gradation similar to that specified for fine aggregate in ASTM C-33.
- The entire filter area must be accessible for easy maintenance without the need to enter a confined space.

A typical filter design includes a gravel drain layer and a perforated pipe underdrain. Filter fabric may be used to prevent the filter media from entering the gravel layer.

The design should not include any permanent pool or other standing water. Instead of including a pretreatment basin, consider the following features in the area tributary to the filter to reduce the potential for filter clogging:

- Limit the size of the Drainage Management Area.
- Include only impervious areas in the DMA.
- Stabilize slopes and eliminate sources of sediment in the DMA.
- Provide screens for trash and leaves at storm drain inlets.

For additional design considerations and details, see [\*Design of Stormwater Filtering Systems\*](#) by Richard A. Claytor and Thomas R. Schueler, The Center for Watershed Protection, 1996, and *California Stormwater BMP Handbooks* Fact Sheet TC-40, Media Filter.

**Extended ("Dry") Detention Basins.** The required detention volume is based on the 85<sup>th</sup> percentile 24-hour storm depth. The steps to calculate the required detention volume are:



1. Use the County of San Diego's 85th Percentile Isopluvial Map to determine the unit basin volume.
2. Determine the weighted runoff factor ("C" factor) for the area tributary to the basin. The factors in Table 4-2 may be used.
3. Multiply the weighted runoff factor times the tributary area times the unit basin volume.

For maximum effectiveness the basin should not be sized substantially larger than this volume.

For design considerations and details, see the [\*California Stormwater Best Management Practice Handbooks\*](#), Fact Sheet TC-22, "Extended Detention Basins." The basin outlet should be designed for a 24-hour drawdown time.

As noted in Fact Sheet TC-22, "dry" detention basins may not be practicable for drainage areas less than 5 acres. The potential for mosquito harborage is a concern. In the design, do not create any areas that will hold standing water for 96 hours or more.

"Wet" Detention Ponds and Constructed Wetlands. The required detention volume is determined as with a "dry" detention basin. Before proceeding with design, contact the local mosquito control agency to coordinate the design and plan ongoing inspection and maintenance of the facility for mosquito control. For design considerations and details, see the [\*California Stormwater Best Management Practices Handbooks\*](#), Fact Sheet TC-20, "Wet Ponds," and Fact Sheet TC-21, "Constructed Wetlands."

Vegetated Swales. Design recommendations for conventional vegetated swales are in the [\*California Stormwater Best Management Practices Handbooks\*](#). The conventional swale design uses available on-site soils and does not include an underdrain system. Where soils are clayey, there is little infiltration. Treatment occurs as runoff flows through grass or other vegetation before exiting at the downstream end. Recommended detention times are on the order of 10 minutes.

Conventional vegetated swales may be used to meet NPDES permit treatment requirements and LID requirements (see page 25). The following should be incorporated in the design:

- Determine the weighted runoff factor ("C" factor) for the area tributary to the swale. The factors in Table 4-2 may be used.
- Calculate the design flow by multiplying the weighted runoff factor times the tributary area times either (1) 0.2 inches of rainfall per hour, or (2) twice the 85<sup>th</sup> percentile hourly rainfall intensity.
- When sizing the swale, use a value of 0.25 for Manning's "n".
- Ensure that all flow enters the swale near its highest point and that no flow short-circuits treatment by entering the swale along its length.

- The swale should be a minimum 100 feet in length.
- Longitudinal slopes should not exceed 2.5%; on flatter slopes, incorporate measures to avoid prolonged surface ponding.

Consider using linear-shaped bioretention areas (see page 71) in place of conventional vegetated swales because:

- Conventional swale design has resulted in standing water and associated nuisances.
- Conventional swales often don't obtain even the design residence time because of the length required and because proper design requires runoff enter the swale at the upstream end rather than at various locations along its length, and
- Bioretention areas provide a more flexible drainage design, more effective practicable treatment, and more effective flow control within the same footprint.

#### ► TREATMENT FACILITIES FOR SPECIAL CIRCUMSTANCES

Higher-rate surface filters and vault-based proprietary filters can only be used in the circumstances described beginning on page 26 and when sand filters, extended “dry” detention basins, and “wet” detention ponds or constructed wetlands have been found infeasible.

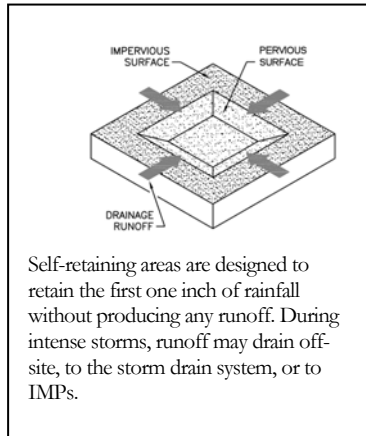
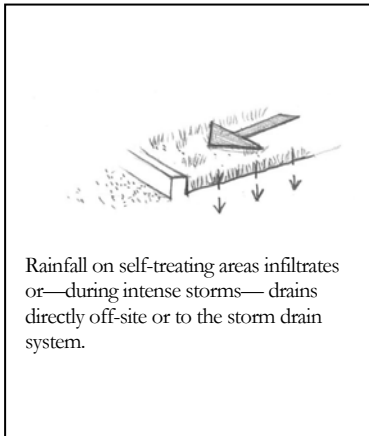
For surface filters, the grading and drainage design should minimize the area draining to each unit and maximize the number of discrete drainage areas and units. Proprietary facilities should be installed consistent with the manufacturer's instructions.

#### References and Resources:

- [RWQCB Order R9-2007-0001 \(Stormwater NPDES Permit\)](#)
- [Low Impact Development Center](#)
- [County of San Diego Low Impact Development Handbook](#)
- [California Best Management Practices Handbooks](#)
- [Design of Stormwater Filtering Systems](#) (Claytor and Scheuler, 1996)
- [American Rainwater Catchment Systems Association](#)
- [Water Conservation Alliance of Southern Arizona](#)
- [Rainwater Harvesting for Drylands and Beyond](#)
- [The Texas Manual on Rainwater Harvesting](#)
- *Managing Wet Weather With Green Infrastructure: Municipal Handbook, Rainwater Harvesting Policies* (Low Impact Development Center, 2008)

## Self-Treating and Self-Retaining Areas

### ► CRITERIA



LID design seeks to manage runoff from roofs and paving so effects on water quality and hydrology are minimized. Runoff from landscaping, however, does not need to be managed the same way.

Runoff from landscaping can be managed by creating self-treating and self-retaining areas.

Self-treating areas are natural, landscaped, or turf areas that drain directly off site or to the storm drain system. Examples include upslope undeveloped areas that are ditched and drained around a development and grassed slopes that drain offsite to a street or storm drain. Self-treating areas may not drain on to adjacent paved areas.

Where a landscaped area is upslope from or surrounded by paved areas, a self-retaining area (also called a zero-discharge area) may be created. Self-retaining areas are designed to retain the first one inch of rainfall without producing any runoff. The technique works best on flat, heavily landscaped sites. It may be used on mild slopes if there is a reasonable expectation that the first inch of rainfall would produce no runoff.

To create self-retaining turf and landscape areas in flat areas or on terraced slopes, berm the area or depress the grade into a concave cross-section so that these areas will retain the first inch of rainfall. Inlets of area drains, if any, should be set 3 inches above the low point to allow ponding.

Areas draining to self retaining areas. Drainage from roofs and paving can be directed to self-retaining areas and allowed to infiltrate into the soil. The maximum allowable ratio is 2 parts impervious: 1 part pervious.

The self-retaining area must be bermed or depressed to retain an inch of rainfall including the flow from the tributary impervious area.

### Best Uses

- Heavily landscaped sites

### Advantages

- No maintenance verification requirement
- Complements site landscaping

### Limitations

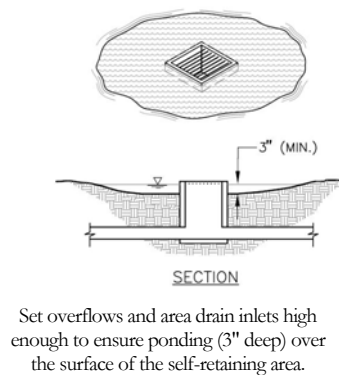
- Requires substantial square footage
- Grading requirements must be coordinated with landscape design

## ► DETAILS

Drainage from self-treating areas must flow to off-site streets or storm drains without flowing on to paved areas.

Pavement within a self-treating area cannot exceed 5% of the total area.

In self-retaining areas, overflows and area drain inlets should be set high enough to ensure ponding over the entire surface of the self-retaining area.



Self-retaining areas should be designed to promote even distribution of ponded runoff over the area.

Leave enough reveal (from pavement down to landscaped surface) to accommodate buildup of turf or mulch.

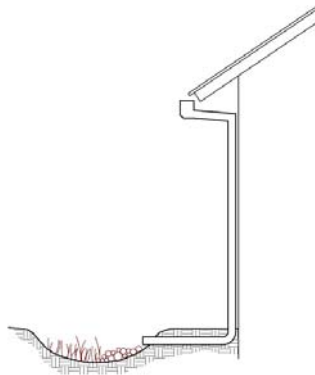
## ► APPLICATIONS

Lawn or landscaped areas adjacent to streets can be considered self-treating areas.

Self-retaining areas can be created by depressing lawn and landscape below surrounding sidewalks and plazas.

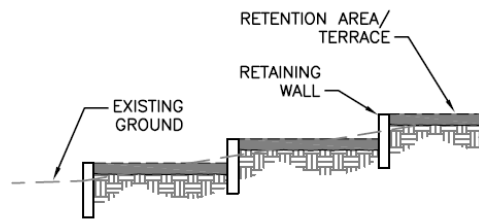
Runoff from walkways or driveways in parks and park-like areas can sheet-flow to self-retaining areas.

Roof leaders can be connected to self-retaining areas by piping beneath plazas and walkways. If necessary, a “bubble-up” can be used.



Connecting a roof leader to a self-retaining area. The head from the eave height makes it possible to route roof drainage some distance away from the building.

Self-retaining areas can be created by terracing mild slopes. The elevation difference promotes subsurface drainage.



Mild slopes can be terraced to create self-retaining areas.

► DESIGN CHECKLIST FOR SELF-TREATING AREAS

- ☐ The self-treating area is at least 95% lawn or landscaping (not more than 5% impervious).
- ☐ Re-graded or re-landscaped areas have amended soils, vegetation, and irrigation as may be required to maintain soil stability and permeability.
- ☐ Runoff from the self-treating area does not enter an IMP or another drainage management area, but goes directly to the storm drain system.

► DESIGN CHECKLIST FOR SELF-RETAINING AREAS

- ☐ Area is bermed all the way around or graded concave.

- ☐ Slopes do not exceed 4%.
  - ☐ Entire area is lawn, landscaping, or pervious pavement (see criteria in Chapter 4).
  - ☐ Area has amended soils, vegetation, and irrigation as may be required to maintain soil stability and permeability.
  - ☐ Any area drain inlets are at least 3 inches above surrounding grade.
- DESIGN CHECKLIST FOR AREAS DRAINING TO SELF-RETAINING AREAS
- ☐ Ratio of tributary impervious area to self-retaining area is not greater than 2:1.
  - ☐ Roof leaders collect runoff and route it to the self-retaining area.
  - ☐ Paved areas are sloped so drainage is routed to the self-retaining area.
  - ☐ Inlets are designed to protect against erosion and distribute runoff across the area.

## Pervious Pavements

### ► CRITERIA

Impervious roadways, driveways, and parking lots account for much of the hydrologic impact of land development. In contrast, pervious pavements allow rainfall to collect in a gravel or sand base course and infiltrate into native soil.

Pervious pavements are designed to transmit rainfall through the surface to storage in a base course. For example, a 4-inch-deep base course provides approximately 1.6 inches of storage. Runoff stored in the base course infiltrates to native soils over time. Except in the case of solid pavers, the surface course provides additional storage.

Areas with the following pervious pavements may be regarded as “self-treating” and require no additional treatment or flow control if they drain off-site (not to an IMP).

- Pervious concrete
- Porous asphalt
- Crushed aggregate (gravel)
- Open pavers with grass or plantings
- Open pavers with gravel
- Artificial turf

Areas with these pervious pavements can also be self-retaining areas and may receive runoff from impervious areas if they are bermed or depressed to retain the first one inch of rainfall, including runoff from the tributary impervious area.

Solid unit pavers—such as bricks, stone blocks, or precast concrete shapes—are considered to reduce runoff compared to impervious pavement, when the unit pavers are set in sand or gravel with  $\frac{1}{4}$ " gaps between the pavers. Joints must be filled with an open-graded aggregate free of fines.

### Best Uses

- Areas with permeable native soils
- Low-traffic areas
- Where aesthetic quality can justify higher cost

### Advantages

- No maintenance verification requirement
- Variety of surface treatments can complement landscape design

### Limitations

- Initial cost
- Placement requires specially trained crews
- Geotechnical concerns, especially in clay soils
- Concerns about pavement strength and surface integrity
- Some municipalities do not allow in public right of way

When draining pervious pavements to an IMP, use the runoff factors in Table 4-2.

#### ► DETAILS

Permeable pavements can be used in clay soils; however, special design considerations, including an increased depth of base course, typically apply and will increase the cost of this option. Geotechnical fabric between the base course and underlying clay soil is recommended.

Pavement strength and durability typically determines the required depth of base course. If underdrains are used, the outlet elevation must be a minimum of 3 inches above the bottom elevation of the base course.

Pervious concrete and porous asphalt must be installed by crews with special training and tools. Industry associations maintain lists of qualified contractors.

Parking lots with crushed aggregate or unit pavers may require signs or bollards to organize parking.

#### ► DESIGN CHECKLIST FOR PERVIOUS PAVEMENTS

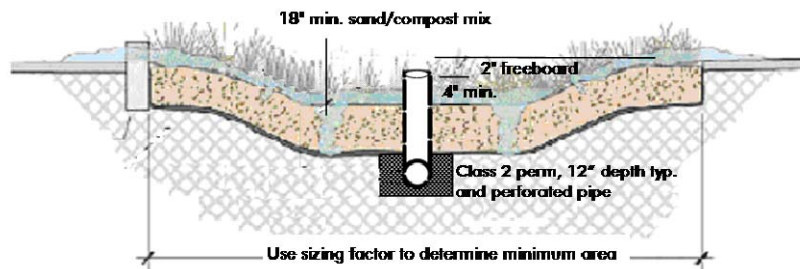
- ☐ No erodible areas drain on to pavement.
- ☐ Subgrade is uniform. Compaction is minimal.
- ☐ Reservoir base course is of open-graded crushed stone. Base depth is adequate to retain rainfall and support design loads.
- ☐ If a subdrain is provided, outlet elevation is a minimum of 3 inches above bottom of base course.
- ☐ Subgrade is uniform and slopes are not so steep that subgrade is prone to erosion.
- ☐ Rigid edge is provided to retain granular pavements and unit pavers.
- ☐ Solid unit pavers are installed with open gaps filled with open-graded aggregate free of fines.
- ☐ Permeable pavements are installed by industry-certified professionals according to vendor's recommendations.
- ☐ Selection and location of pavements incorporates Americans with Disabilities Act requirements, site aesthetics, and uses.

#### Resources

- Southern California Concrete Producers [www.concreteresources.net](http://www.concreteresources.net).
- California Asphalt Pavement Association  
<http://www.californiapavements.org/stormwater.html>
- Interlocking Concrete Pavement Institute  
<http://www.icpi.org/>
- *Start at the Source Design Manual for Water Quality Protection*, pp. 47-53. [www.basmaa.org](http://www.basmaa.org)
- *Porous Pavements*, by Bruce K. Ferguson. 2005. ISBN 0-8493-2670-2.



## Bioretention Facilities



Bioretention facility configured for treatment-only requirements. Bioretention facilities can be rectangular, linear, or nearly any shape.

Bioretention detains runoff in a surface reservoir, filters it through plant roots and a biologically active soil mix, and then infiltrates it into the ground. Where native soils are less permeable, an underdrain conveys treated runoff to storm drain or surface drainage.

Bioretention facilities can be configured in nearly any shape. When configured as linear swales, they can convey high flows while percolating and treating lower flows.

Bioretention facilities can be configured as in-ground or above-ground planter boxes, with the bottom open to allow infiltration to native soils underneath. If infiltration cannot be allowed, use the sizing factors and criteria for the Flow-Through Planter.

### ► CRITERIA

For development projects subject only to runoff treatment requirements, the following criteria apply:

Parameter	Criterion
Soil mix depth	18 inches minimum
Soil mix minimum percolation rate	5 inches per hour minimum sustained (10 inches per hour initial rate recommended)
Soil mix surface area	0.04 times tributary impervious area (or equivalent)

### Best Uses

- Commercial areas
- Residential subdivisions
- Industrial developments
- Roadways
- Parking lots
- Fit in setbacks, medians, and other landscaped areas

### Advantages

- Can be any shape
- Low maintenance
- Can be landscaped

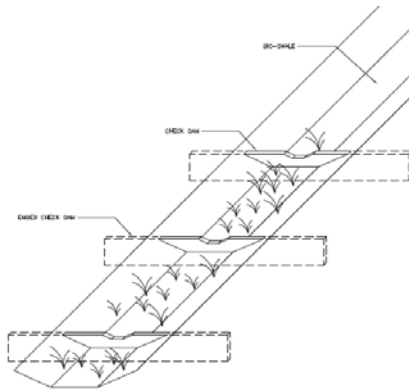
### Limitations

- Require 4% of tributary impervious square footage
- Typically requires 3-4 feet of head
- Irrigation typically required

Parameter	Criterion
Surface reservoir depth	6 inches minimum; may be sloped to 4 inches where adjoining walkways.
Underdrain	Required in Group “C” and “D” soils. Perforated pipe embedded in gravel (“Class 2 permeable” recommended), connected to storm drain or other accepted discharge point.

► DETAILS

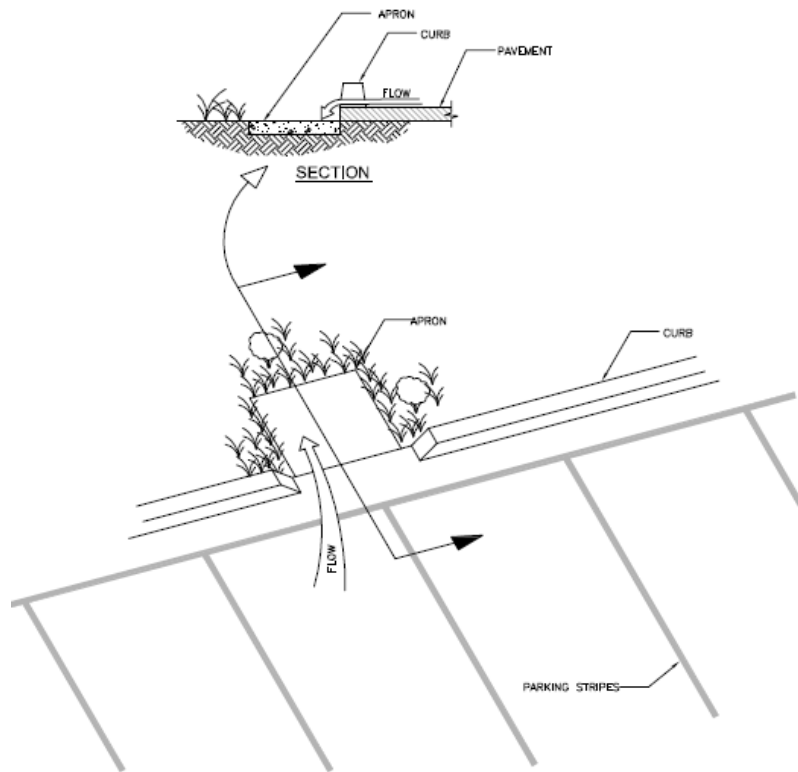
**Plan.** On the surface, a bioretention facility should be one level, shallow basin—or a series of basins. As runoff enters each basin, it should flood and fill throughout before runoff overflows to the outlet or to the next downstream basin. This will help prevent movement of surface mulch and soil mix.



Use check dams for linear bioretention facilities (swales) on a slope.

In a linear swale, check dams should be placed so that the lip of each dam is at least as high as the toe of the next upstream dam. A similar principle applies to bioretention facilities built as terraced roadway shoulders.

**Inlets.** Paved areas draining to the facility should be graded, and inlets should be placed, so that runoff remains as sheet flow or as dispersed as possible. Curb cuts should be wide (12" is recommended) to avoid clogging with leaves or debris. Allow for a minimum reveal of 4"-6" between the inlet and soil mix elevations to ensure turf or mulch buildup does not block the inlet. In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet.



Recommended design details for bioretention facility inlets (see text).

Where runoff is collected in pipes or gutters and conveyed to the facility, protect the landscaping from high-velocity flows with energy-dissipating rocks. In larger installations, provide cobble-lined channels to better distribute flows throughout the facility.

Upturned pipe outlets can be used to dissipate energy when runoff is piped from roofs and upgradient paved areas.

**Soil mix.** The required soil mix is similar to a loamy sand. It must maintain a minimum percolation rate of 5" per hour throughout the life of the facility, and it must be suitable for maintaining plant life. Typically, on-site soils will not be suitable due to clay content.

**Storage and drainage layer.** "Class 2 permeable," Caltrans specification 68-1.025, is recommended. Open-graded crushed rock, washed, may be used, but requires 4"-6" washed pea gravel be substituted at the top of the crushed rock gravel layers. Do not use filter fabric to separate the soil mix from the gravel drainage layer or the gravel drainage layer from the native soil.

**Underdrains.** No underdrain is required where native soils beneath the facility are Hydrologic Soil Group A or B. For treatment-only facilities where native soils are Group C or D, a

perforated pipe must be bedded in the gravel layer and must terminate at a storm drain or other approved discharge point.

**Outlets.** In treatment-only facilities, outlets must be set high enough to ensure the surface reservoir fills and the entire surface area of soil mix is flooded before the outlet elevation is reached. In swales, this can be achieved with appropriately placed check dams.

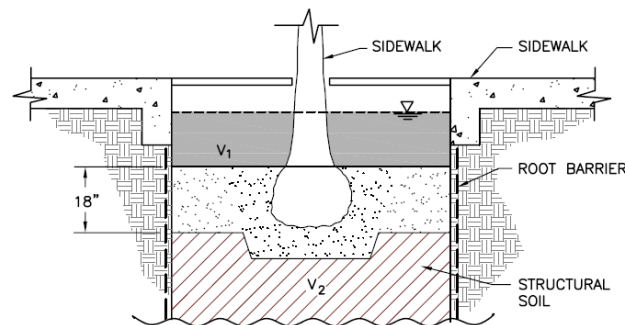
The outlet should be designed to exclude floating mulch and debris.

**Vaults, utility boxes and light standards.** It is best to locate utilities outside the bioretention facility—in adjacent walkways or in a separate area set aside for this purpose. If utility structures are to be placed within the facility, the locations should be anticipated and adjustments made to ensure the minimum bioretention surface area and volumes are achieved. Leaving the final locations to each individual utility can produce a haphazard, unaesthetic appearance and make the bioretention facility more difficult to maintain.

**Emergency overflow.** The site grading plan should anticipate extreme events and potential clogging of the overflow and route emergency overflows safely.

**Trees.** Bioretention areas can accommodate small or large trees. There is no need to subtract the area taken up by roots from the effective area of the facility. Extensive tree roots maintain soil permeability and help retain runoff. Normal maintenance of a bioretention facility should not affect tree lifespan.

The bioretention facility can be integrated with a tree pit of the required depth and filled with structural soil. If a root barrier is used, it can be located to allow tree roots to spread throughout the bioretention facility while protecting adjacent pavement. Locations and planting elevations should be selected to avoid blocking the facility's inlets and outlets.



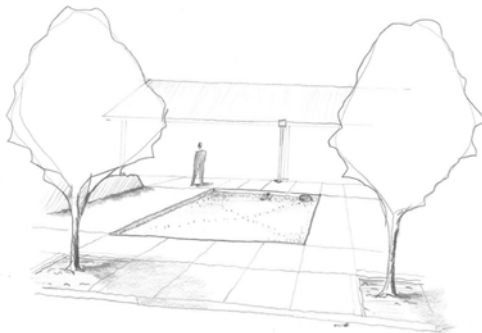
Bioretention facility configured as a tree well.  
The root barrier is optional.

## ► APPLICATIONS

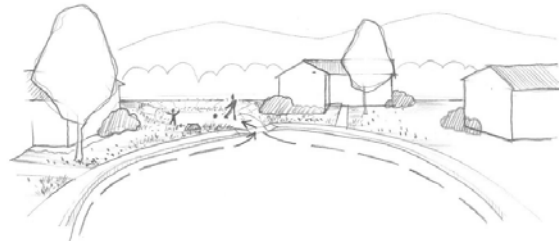
Multi-purpose landscaped areas. Bioretention facilities are easily adapted to serve multiple purposes. The loamy sand soil mix will support turf or a plant palette suitable to the location and a well-drained soil.

Example landscape treatments:

- Lawn with sloped transition to adjacent landscaping.
- Swale in setback area
- Swale in parking median
- Lawn with hardscaped edge treatment
- Decorative garden with formal or informal plantings
- Traffic island with low-maintenance landscaping
- Raised planter with seating
- Bioretention on a terraced slope



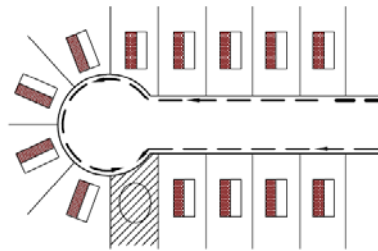
Bioretention facility configured as a recessed decorative lawn with hardscaped edge.



Bioretention facility configured and planted as a lawn/ play area.

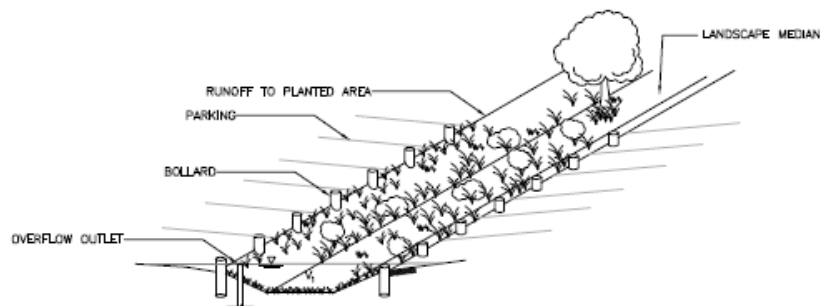
Residential subdivisions. Some subdivisions are designed to drain roofs and driveways to the streets (in the conventional manner) and then drain the streets to bioretention areas, with one bioretention area for each 1 to 6 lots, depending on subdivision layout and topography.

If allowed by the local jurisdiction, bioretention areas can be placed on a separate, dedicated parcel with joint ownership.



Bioretention facility receiving drainage from individual lots and the street in a residential subdivision.

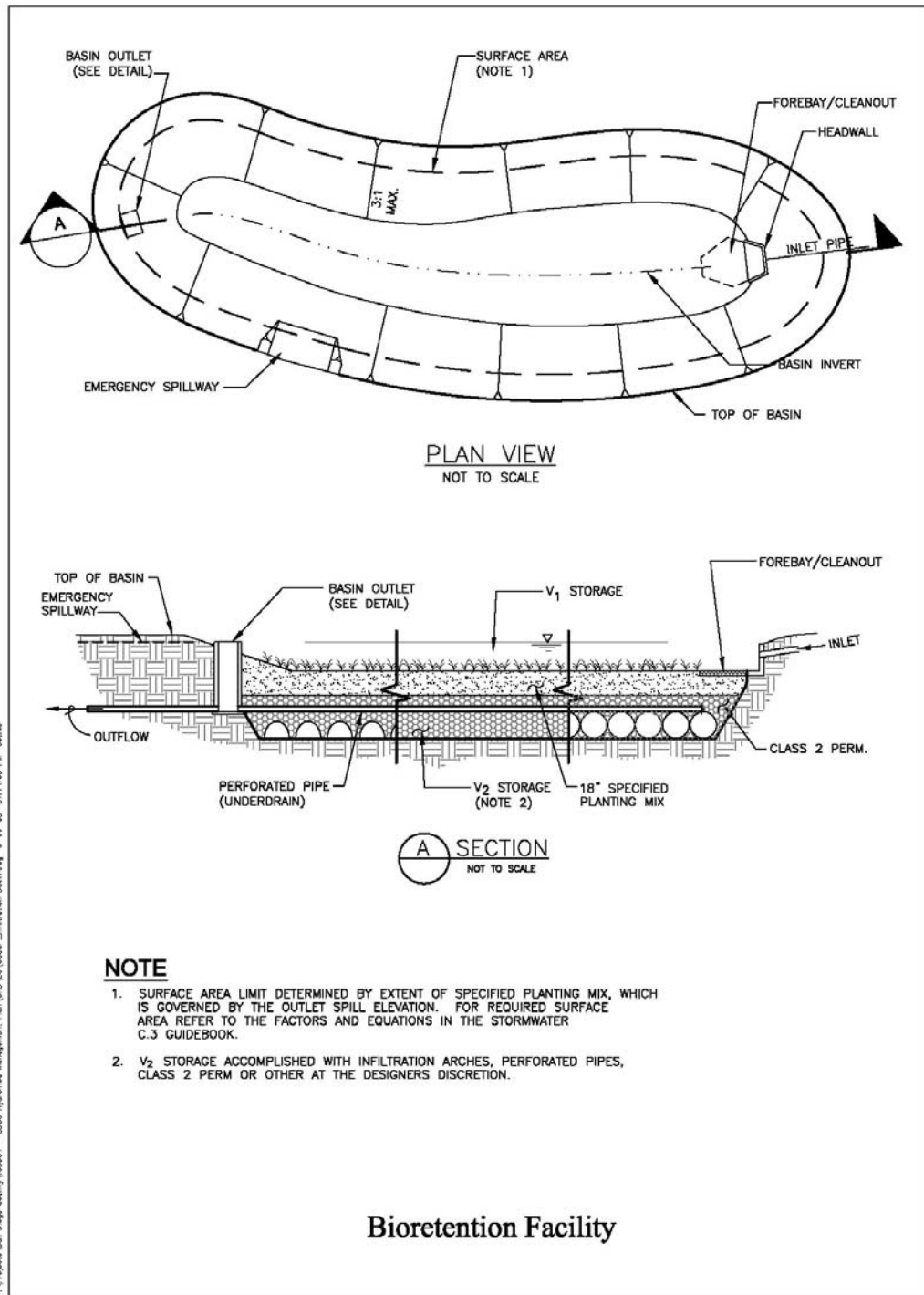
Sloped sites. Bioretention facilities must be constructed as a basin, or series of basins, with the circumference of each basin set level. It may be necessary to add curbs or low retaining walls.



Bioretention facility configured as a parking median.  
Note use of bollards in place of curbs, eliminating the need for curb cuts.

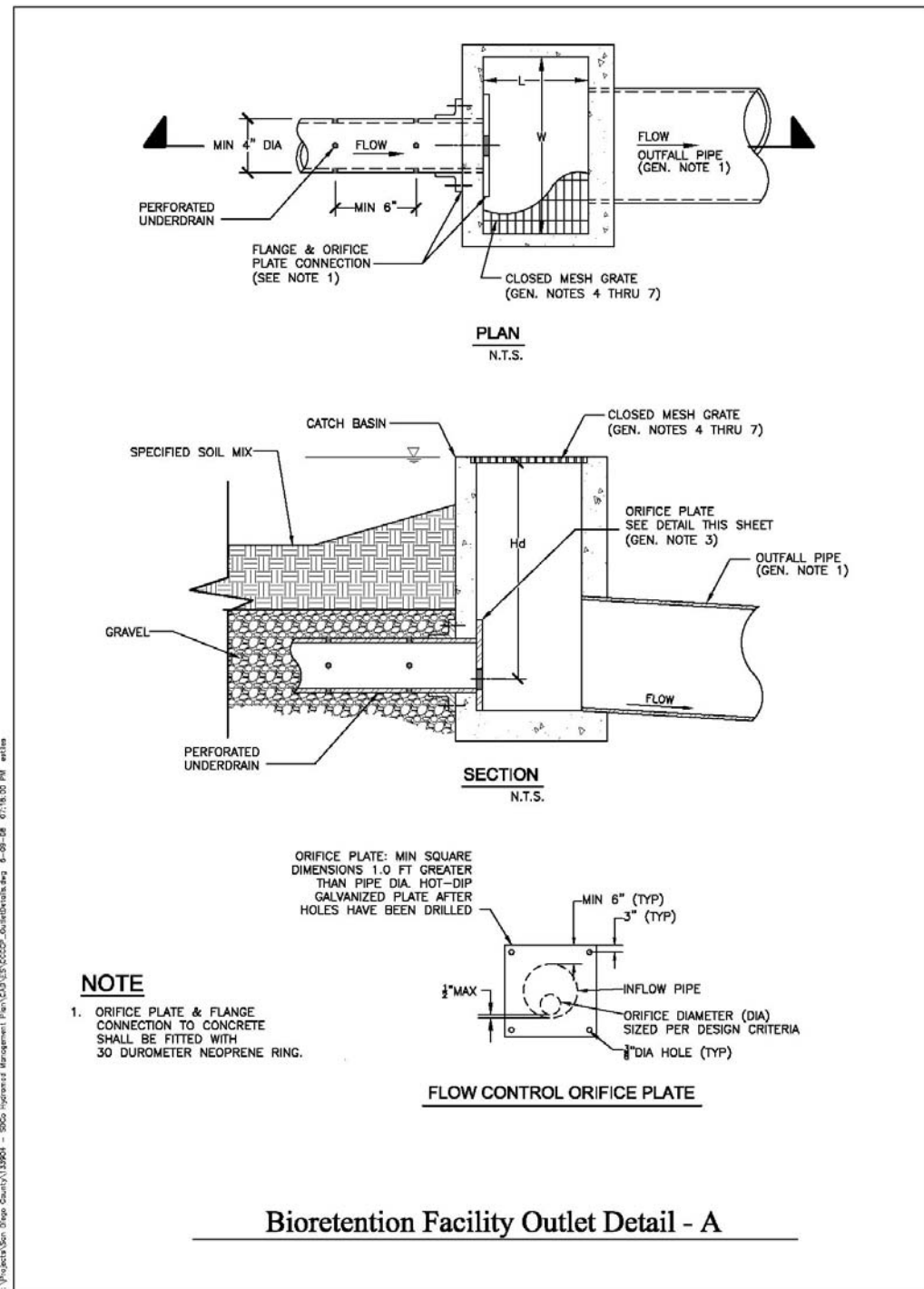
## Design Checklist for Bioretention

- ☐ Volume or depth of surface reservoir meets or exceeds minimum.
- ☐ 18" depth "loamy sand" soil mix with minimum long-term percolation rate of 5"/hour.
- ☐ Area of soil mix meets or exceeds minimum.
- ☐ Perforated pipe underdrain bedded in "Class 2 perm" with connection and sufficient head to storm drain or discharge point (except in "A" or "B" soils).
- ☐ No filter fabric.
- ☐ Underdrain has a clean-out port consisting of a vertical, rigid, non-perforated PVC pipe, with a minimum diameter of 6 inches and a watertight cap.
- ☐ Location and footprint of facility are shown on site plan and landscaping plan.
- ☐ Bioretention area is designed as a basin (level edges) or a series of basins, and grading plan is consistent with these elevations. If facility is designed as a swale, check dams are set so the lip of each dam is at least as high as the toe of the next upstream dam.
- ☐ Inlets are 12" wide, have 4"-6" reveal and an apron or other provision to prevent blockage when vegetation grows in, and energy dissipation as needed.
- ☐ Overflow connected to a downstream storm drain or approved discharge point.
- ☐ Emergency spillage will be safely conveyed overland.
- ☐ Plantings are suitable to the climate and a well-drained soil.
- ☐ Irrigation system with connection to water supply.
- ☐ Vaults, utility boxes, and light standards are located outside the minimum soil mix surface area.
- ☐ When excavating, avoid smearing of the soils on bottom and side slopes. Minimize compaction of native soils and "rip" soils if clayey and/or compacted. Protect the area from construction site runoff.



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## Flow-through Planter



Portland 2004 Stormwater Manual

### Best Uses

- Management of roof runoff
- Next to buildings
- Dense urban areas
- Where infiltration is not desired

### Advantages

- Can be used next to structures
- Versatile
- Can be any shape
- Low maintenance

### Limitations

- Can be used for flow-control only on sites with “C” and “D” soils
- Requires underdrain
- Requires 3-4 feet of head

Flow-through planters treat and detain runoff without allowing seepage into the underlying soil. They can be used next to buildings and on slopes where stability might be affected by adding soil moisture.

Flow-through planters typically receive runoff via downspouts leading from the roofs of adjacent buildings. However, they can also be set in-ground and receive sheet flow from adjacent paved areas.

Pollutants are removed as runoff passes through the soil layer and is collected in an underlying layer of gravel or drain rock. A perforated-pipe underdrain is typically connected to a storm drain or other discharge point. An overflow inlet conveys flows which exceed the capacity of the planter.

### ► CRITERIA

Treatment only. For development projects subject only to runoff treatment requirements, the following criteria apply:

Parameter	Criterion
Soil mix depth	18 inches minimum
Soil mix minimum percolation rate	5 inches per hour minimum sustained (10 inches per hour initial rate recommended)

Parameter	Criterion
Soil mix surface area	0.04 times tributary impervious area (or equivalent)
Surface reservoir depth	6" minimum; may be sloped to 4" where adjoining walkways.
Underdrain	Typically used. Perforated pipe embedded in gravel ("Class 2 permeable" recommended), connected to storm drain or other accepted discharge point.

#### ► DETAILS

**Configuration.** The planter must be level. To avoid standing water in the subsurface layer, set the perforated pipe underdrain and orifice as nearly flush with the planter bottom as possible.

**Inlets.** Protect plantings from high-velocity flows by adding rocks or other energy-dissipating structures at downspouts and other inlets.

**Soil mix.** The required soil mix is similar to a loamy sand. It must maintain a minimum percolation rate of 5" per hour throughout the life of the facility, and it must be suitable for maintaining plant life. Typically, on-site soils will not be suitable due to clay content.

**Gravel storage and drainage layer.** "Class 2 permeable," Caltrans specification 68-1.025, is recommended. Open-graded crushed rock, washed, may be used, but requires 4"-6" of washed pea gravel be substituted at the top of the crushed rock layer. **Do not use filter fabric** to separate the soil mix from the gravel drainage layer.

**Emergency overflow.** The planter design and installation should anticipate extreme events and potential clogging of the overflow and route emergency overflows safely.

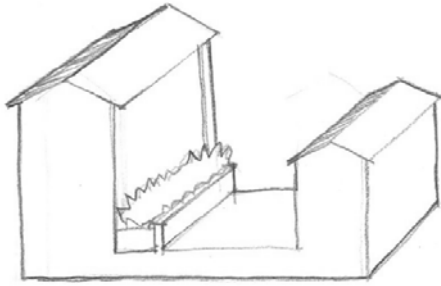
#### ► APPLICATIONS

**Adjacent to buildings.** Flow-through planters may be located adjacent to buildings, where the planter vegetation can soften the visual effect of the building wall. A setback with a raised planter box may be appropriate even in some neo-traditional pedestrian-oriented urban streetscapes.

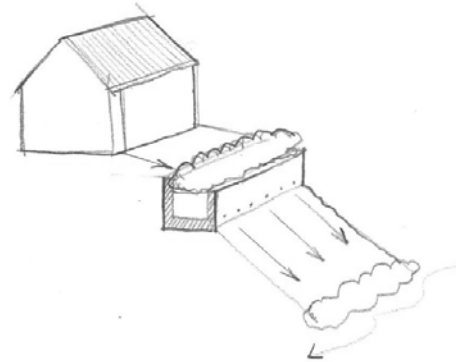
**At plaza level.** Flow-through planters have been successfully incorporated into podium-style developments, with the planters placed on the plaza level and receiving runoff from the tower roofs above. Runoff from the plaza level is typically managed separately by additional flow-through planters or bioretention facilities located at street level.

**Steep slopes.** Flow-through planters provide a means to detain and treat runoff on slopes that cannot accept infiltration from a bioretention facility. The planter can be built into the slope similar to a retaining wall. The design should consider the need to access the planter for periodic

maintenance. Flows from the planter underdrain and overflow must be directed in accordance with local requirements. It is sometimes possible to disperse these flows to the downgradient hillside.



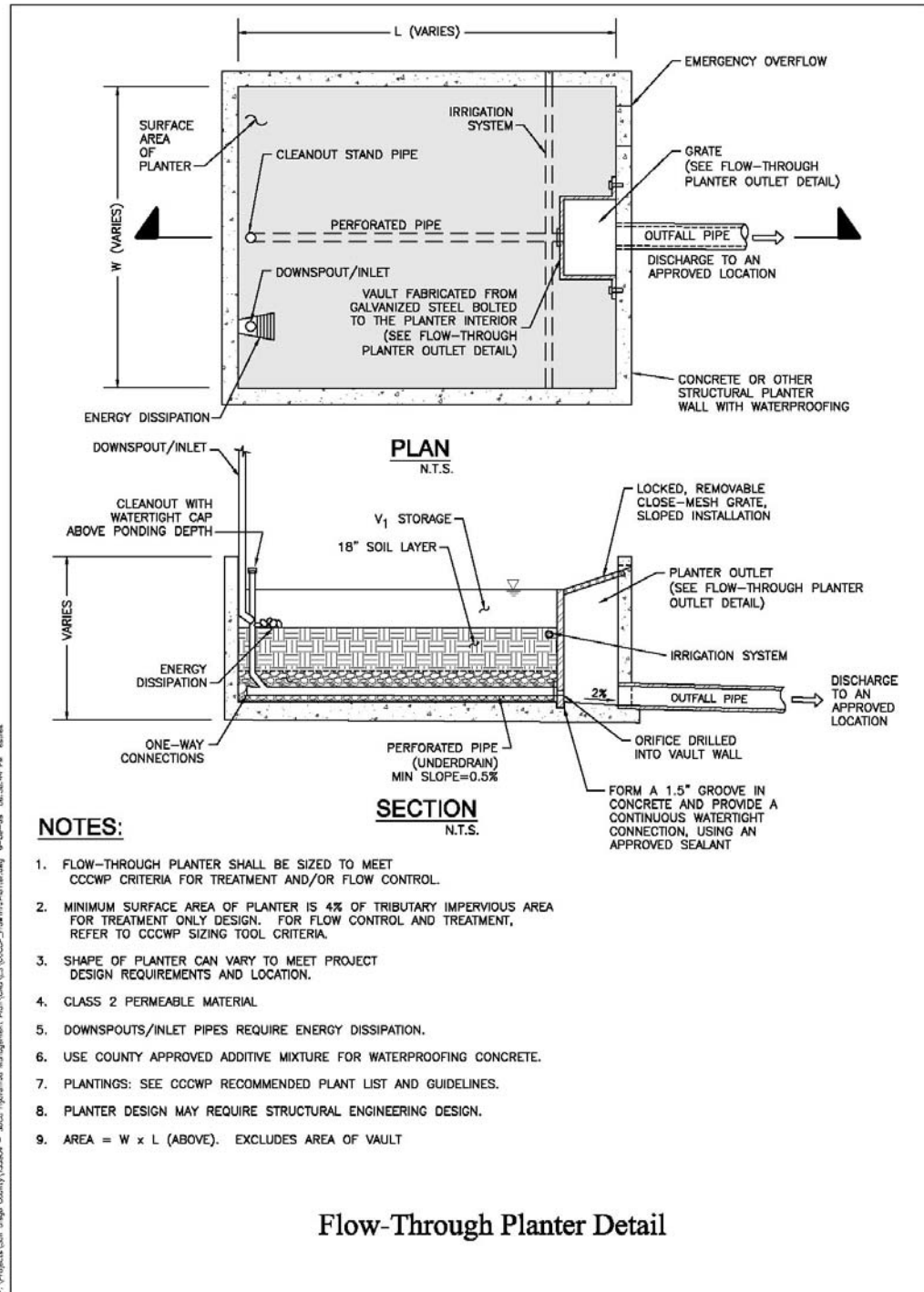
Flow-through planter on the plaza level of a podium-style development.

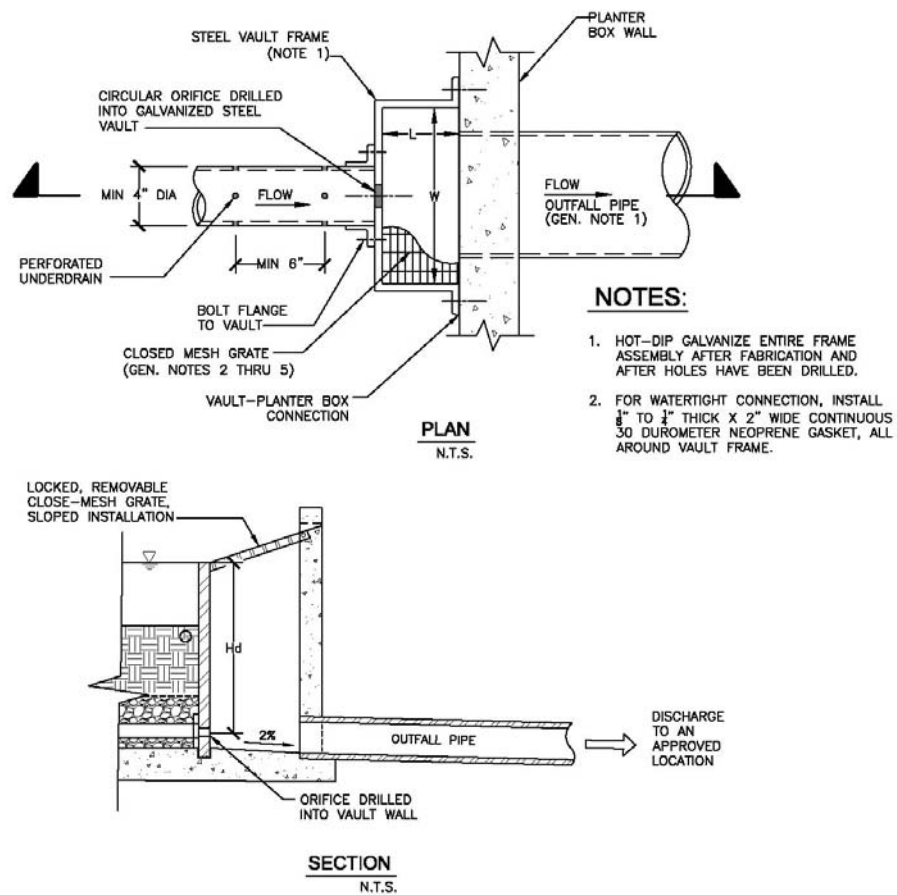


Flow-through planter built into a hillside. Flows from the underdrain and overflow must be directed in accordance with local requirements.

## Design Checklist for Flow-through Planter

- ☐ Reservoir depth is 4-6" minimum.
- ☐ 18" depth "loamy sand" soil mix with minimum long-term infiltration rate of 5"/hour.
- ☐ Area of soil mix meets or exceeds minimum.
- ☐ "Class 2 perm" drainage layer.
- ☐ No filter fabric.
- ☐ Perforated pipe underdrain with outlet located flush or nearly flush with planter bottom. Connection with sufficient head to storm drain or discharge point.
- ☐ Underdrain has a clean-out port consisting of a vertical, rigid, non-perforated PVC pipe, with a minimum diameter of 6 inches and a watertight cap.
- ☐ Overflow connected to a downstream storm drain or approved discharge point.
- ☐ Location and footprint of facility are shown on site plan and landscaping plan.
- ☐ Planter is set level.
- ☐ Emergency spillage will be safely conveyed overland.
- ☐ Plantings are suitable to the climate and a well-drained soil.
- ☐ Irrigation system with connection to water supply.





#### GENERAL OUTLET DETAIL NOTES:

1. OUTFALL PIPE SHALL BE SIZED TO CONVEY DESIGN STORM PER CCCWP DESIGN CRITERIA.
2. GRATE SHALL BE MOUNTED USING STAINLESS STEEL HARDWARE AND PROVIDED WITH HINGED AND LOCKABLE OR BOLTABLE ACCESS PANELS.
3. GRATE SHALL BE STAINLESS STEEL, ALUMINUM OR STEEL. STEEL GRATES SHALL BE HOT DIP GALVANIZED AND MAY BE HOT POWDER PAINTED AFTER GALVANIZING.
4. GRATE SHALL BE DESIGNED SUCH THAT THE DIAGONAL DIMENSION OF EACH OPENING IS SMALLER THAN THE DIAMETER OF THE OUTFALL PIPE.
5. STRUCTURAL DESIGN OF GRATE SHALL BE BASED ON FULL HYDROSTATIC HEAD WITH ZERO HEAD DOWNSTREAM OF GRATE.

### Flow-Through Planter Outlet Detail

## Dry Wells and Infiltration Basins

The typical dry well is a prefabricated structure, such as an open-bottomed vault or box, placed in an excavation or boring. The vault may be empty, which provides maximum space efficiency, or may be filled in rock.

An infiltration basin has the same functional components—a volume to store runoff and sufficient area to infiltrate that volume into the native soil—but is open rather than covered.

### ► CRITERIA

Dry wells and infiltration basins must be designed with the minimum volume calculated by Equation 4-8 using a unit volume based on the County of San Diego's 85<sup>th</sup> Percentile Isopluvial Map.

Consult with the local jurisdiction engineer regarding the need to verify soil permeability and other site conditions are suitable for dry wells and infiltration basins. Some proposed criteria are on Page 5-12 of Caltrans' 2004 *BMP Retrofit Pilot Study Final Report* (CTSW-RT-01-050).

The infiltration rate and infiltrative area must be sufficient to drain a full facility within 96 hours.

### ► DETAILS

Dry wells should be sited to allow for the potential future need for removal and replacement.

In locations where native soils are coarser than a medium sand, the area directly beneath the facility should be over-excavated by two feet and backfilled with sand as a groundwater protection measure.

### Best Uses

- Alternative to bioretention in areas with permeable soils

### Advantages

- Compact footprint
- Can be installed in paved areas

### Limitations

- Can be used only on sites with "A" and "B" soils
- Requires minimum of 10' from bottom of facility to seasonal high groundwater
- Not suitable for drainage from some industrial areas or arterial roads
- Must be maintained to prevent clogging.



## Design Checklist for Dry Well

- ☐ Volume and infiltrative area meet or exceed minimum.
- ☐ Overflow connected to a downstream storm drain or approved discharge point.
- ☐ Emergency spillage will be safely conveyed overland.
- ☐ Depth from bottom of the facility to seasonally high groundwater elevation is  $\geq 10'$ .
- ☐ Areas tributary to the facility do not include automotive repair shops; car washes; fleet storage areas (Bus, truck, etc.); nurseries, or other uses that may present an exceptional threat to groundwater quality.
- ☐ Underlying soils are in Hydrologic Soil Group A or B. Infiltration rate is sufficient to ensure a full basin will drain completely within 96 hours. Soil infiltration rate has been confirmed.
- ☐ Set back from structures 10' or as recommended by structural or geotechnical engineer

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## Cistern with Bioretention Facility

A cistern in series with a bioretention facility can meet treatment requirements where space is limited. In this configuration, the cistern is equipped with a flow-control orifice and the bioretention facility is sized to treat a trickle outflow from the cistern.

### ► CRITERIA

**Cistern.** The cistern must detain the volume calculated by Equation 4-8 and must include an orifice or other device designed for a 24-hour drawdown time.

**Bioretention facility.** See the design sheet for bioretention facilities. The area of the bioretention facility must be sized to treat the maximum discharge flow, assuming a percolation rate of 5" per hour through the engineered soil.

**Use with sand filter.** A cistern in series with a sand filter can meet treatment requirements. See the discussion of treatment facility selection in Chapter 2 and the design guidance for sand filters in Chapter 4.

### ► DETAILS

**Flow-control orifice.** The cistern must be equipped with an orifice plate or other device to limit flow to the bioretention area.

**Preventing mosquito harborage.** Cisterns should be designed to drain completely, leaving no standing water. Drains should be located flush with the bottom of the cistern. Alternatively—or in addition—all entry and exit points, should be provided with traps or sealed or screened to prevent mosquito entry. Note mosquitoes can enter through openings  $\frac{1}{16}$ " or larger and will fly for many feet through pipes as small as  $\frac{1}{4}$ ".

**Exclude debris.** Provide leaf guards and/or screens to prevent debris from accumulating in the cistern.

**Ensure access for maintenance.** Design the cistern to allow for cleanout. Avoid creating the need for maintenance workers to enter a confined space. Ensure the outlet orifice can be easily accessed for cleaning and maintenance.

### Best Uses

- In series with a bioretention facility to meet treatment requirement in limited space.
- Management of roof runoff
- Dense urban areas

### Advantages

- Storage volume can be in any configuration

### Limitations

- Somewhat complex to design, build, and operate
- Requires head for both cistern and bioretention facility

## ► APPLICATIONS

Shallow ponding on a flat roof. The “cistern” storage volume can be designed in any configuration, including simply storing rainfall on the roof where it falls and draining it away slowly. See the County of San Diego’s 85<sup>th</sup> percentile isopluvial diagrams for required average depths.

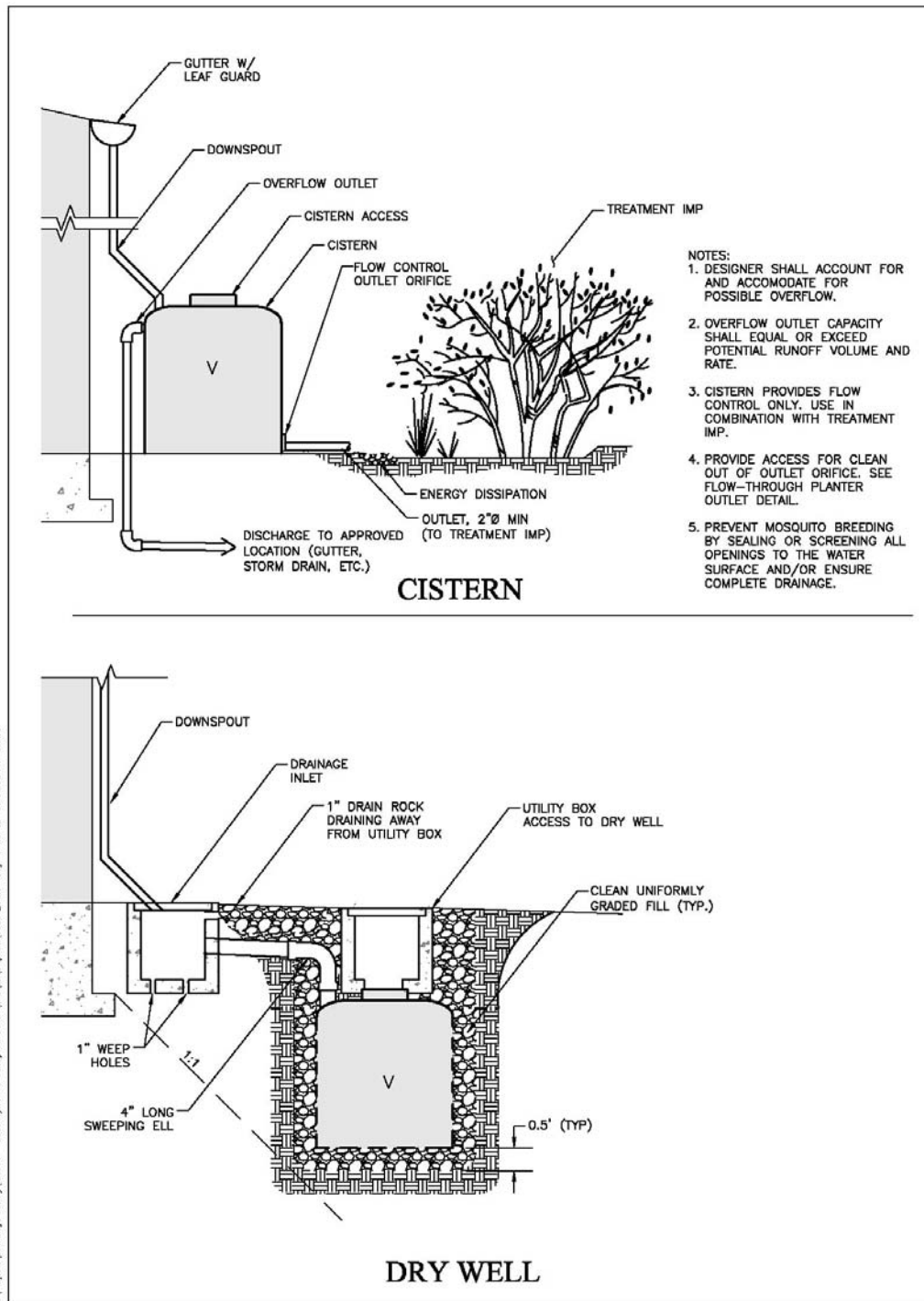
Cistern attached to a building and draining to a planter. This arrangement allows a planter box to be constructed with a smaller area.

Vault with pumped discharge to bioretention facility. In this arrangement, runoff from a parking lot and/or building roofs can be captured and detained underground and then pumped to a bioretention facility on the surface. Alternatively, treatment can be accomplished with a sand filter. See the discussion of selection of stormwater treatment facilities in Chapter 2.

Water harvesting or graywater reuse. It may be possible to create a site-specific design that uses cisterns to achieve stormwater flow control, stormwater treatment, and rainwater reuse for irrigation or indoor uses (water harvesting). Facilities must meet criteria for capturing and treating the volume specified by Equation 4-8. This volume must be allowed to empty within 24 hours so runoff from additional storms, which may follow, is also captured and treated. Additional volume may be required if the system also stores runoff for longer periods for reuse. Indoor uses of non-potable water may be restricted or prohibited. Check with County staff.

### Design Checklist for Cistern

- ☐ Volume meets or exceeds minimum.
- ☐ Outlet with orifice or other flow-control device restricts flow and is designed to provide a 24-hour drawdown time.
- ☐ Outlet is piped to a bioretention facility designed to treat the maximum discharge from the cistern orifice.
- ☐ Cistern is designed to drain completely and/or sealed to prevent mosquito harborage.
- ☐ Design provides for exclusion of debris and accessibility for maintenance.
- ☐ Overflow connected to a downstream storm drain or approved discharge point.
- ☐ Emergency spillage will be safely conveyed overland.



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## Operation & Maintenance of Stormwater Facilities

*How to prepare a customized Stormwater Maintenance Plan for the treatment BMPs on your site.*

The stormwater NPDES Permit requires the County to verify all treatment and flow-control facilities are adequately maintained. Facilities you install as part of your project will be verified for effectiveness and proper performance. The County will also verify the ongoing function of stormwater management features that are not treatment or flow control facilities, such as permeable pavements and limitations on impervious area.

Operation and maintenance of stormwater facilities is a six-stage process:

1. Determine who will own the facility and be responsible for the maintenance of treatment facilities. Identify the means by which ongoing maintenance will be assured (for example, a maintenance agreement that runs with the land).
2. Identify typical maintenance requirements, and allow for these requirements in your project planning and preliminary design.
3. Prepare a maintenance plan for the site incorporating detailed requirements for each treatment and flow-control facility.
4. Maintain the facilities from the time they are constructed until ownership and maintenance responsibility is formally transferred.
5. Formally transfer operation and maintenance responsibility to the site owner or occupant. A warranty, secured by a bond, or other financial instrument, may be required to secure against lack of performance due to flaws in design or construction.
6. Maintain the facilities in perpetuity and comply with the County's self-inspection, reporting, and verification requirements.

See the schedule for these stages in Table 5-1.

## Stage 1: Ownership and Responsibility

You must specify a means to ensure maintenance of treatment and flow-control facilities in perpetuity.

Depending on the intended use of your site and the maintenance category your project falls into, this may require one or more of the following:

- Execution of a maintenance agreement that “runs with the land.”
- Creation of a homeowners association (HOA) and execution of an agreement by the HOA to maintain the facilities as well as an annual inspection fee.
- Formation of a new community facilities district or other special district, or addition of the properties to an existing special district.
- Dedication of fee title or easement transferring ownership of the facility (and the land under it) to the County.

Ownership and maintenance responsibility for treatment and flow-control facilities should be discussed at the beginning of project planning, typically at the pre-application meeting for planning and zoning review. Experience has shown provisions to finance and implement maintenance of treatment and flow-control facilities can be a major stumbling block to project approval, particularly for small residential subdivisions. (See “New Subdivisions” in Chapter 1.)

### ► PRIVATE OWNERSHIP AND MAINTENANCE

The County requires—as a condition of project approval—that a maintenance agreement be executed.

TABLE 5-1. SCHEDULE for planning operation and maintenance of stormwater treatment BMPs

<i>Stage</i>	<i>Description</i>	<i>Schedule</i>
1	Determine facility ownership and maintenance responsibility	Discuss with project review staff at pre-application meeting
2	Identify typical maintenance requirements	In initial submittal, coordinate with planning & zoning application
3	Develop detailed operation and maintenance plan	As required by County
4	Interim operation and maintenance of facilities	During and following construction including warranty period
5	Formal transfer of operation & maintenance responsibility	On sale and transfer of property or permanent occupancy



- |   |   |               |
|---|---|---------------|
| 6 | Ongoing maintenance and compliance with inspection & reporting requirements | In perpetuity |
|---|---|---------------|

Applicants must propose for County determination the appropriate maintenance mechanism for selected BMPs. The BMPs should fit into one of the following categories:

► FIRST CATEGORY

The County should have only minimal concern for ongoing maintenance. The proposed BMPs inherently "take care of themselves", or property owners can naturally be expected to do so as an incident of taking care of their property

Typical BMPs:

- Biofilters (Grass swale, Grass strip, vegetated buffer)
- Infiltration BMP (basin, trench)

Mechanisms to Assure Maintenance:

1. Stormwater Ordinance Requirement: The WPO requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.
2. Public Nuisance Abatement: Under the WPO failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.
3. Notice to Purchasers. Section 67.813(e) of the WPO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.
4. Conditions in Ongoing Land Use Permits: For those applications (listed in WPO Section 67.803(c)) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the maintenance plan (Attachment F in the Major SWMP). Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.

5. Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)

Funding:

None Required.

► SECOND CATEGORY

The County needs to assure ongoing maintenance. The nature of the proposed BMPs indicates that it is appropriate for property owners to be given primary responsibility for maintenance, on a perpetual basis (unless a stormwater utility is eventually formed). However, the County (in a "backup" role) needs to be able to step in and perform the maintenance if property owner fails, and needs to have security to provide funding for such backup maintenance. Security for "backup" maintenance after the interim period (5 years) would not be provided, however primary owner maintenance responsibility would remain. If a stormwater utility or other permanent mechanism is put into place, it could assume either a primary or backup maintenance role.

Typical BMPs:

- Biofilters;
- Small Detention Basins;
- Infiltration BMP, and;
- Single Storm Drain Inserts, Oil/Water separator, Catch basin insert & screens.

Mechanisms to Assure Maintenance

1. Stormwater Ordinance Requirement: The WPO requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.
2. Public Nuisance Abatement: Under the WPO failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public

Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.

3. Notice to Purchasers. Section 67.813(e) of the WPO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.
4. Conditions in Ongoing Land Use Permits: For those applications (listed in WPO Section 67.803(c)) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the maintenance plan. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.
5. Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)
6. BMP Maintenance Agreement with Easement and Covenant: An agreement will be entered into with the County, which will function three ways:
  - (a) It will commit the land to being used only for purposes of the BMP;
  - (b) It will include an agreement by the landowner, to maintain the facilities in accordance with the maintenance plan (this obligation would be passed on to future purchasers or successors of the landowner, as a covenant); and
  - (c) It will include an easement giving the County the right to enter onto the land (and any necessary adjacent land needed for access) to maintain the BMPs.

This would be required of all applications listed in WPO Section 67.804. In the case of subdivisions, this easement and covenant would be recorded on or prior to the Final or Parcel Map.

#### Funding:

Developer would provide the County with security to substantiate the maintenance agreement, which would remain in place for an interim period of 5 years. The amount of the security would equal the estimated cost of 2 years of maintenance activities. The security can be a Cash Deposit, Letter of Credit or other form acceptable to the County.

## ► THIRD CATEGORY:

The County needs to assure ongoing maintenance is heightened, to the point that the County is willing to take on this responsibility. A permanent funding mechanism needs to be established.

Typical BMPs:

- Biofilters
- Detention Basins
- Infiltration BMP
- Wet Ponds and Wetlands
- Multiple Storm Drain Inserts, Oil/Water separators, Catch basin insert & screens.
- Filtration Systems
- Hydrodynamic Separators

Mechanisms to Assure Maintenance:

1. Dedication of BMP to County for maintenance: The developer would be required to dedicate to the County all necessary easements for maintenance, including access, over the property on which the BMP is located. This could be an immediate dedication, or for cases where the County would not want to assume responsibility for the facility for some time (e.g., until after construction is completed), then an Irrevocable Offer of Dedication (IOD) could be used instead.
2. County Maintenance Documentation: Where the County has assumed maintenance responsibility, internal County program documentation would memorialize the required maintenance.

Funding:

The primary funding mechanism will be a special assessment under the authority of the Flood Control District. The assessment will be collected with property tax. Because this primary funding mechanism will require substantial amount of time to establish and collect assessments, a developer fee is required to cover the initial maintenance period of 24 months.

## ► FOURTH CATEGORY

Proposed BMPs that are recognized from the beginning as deserving of public ownership and maintenance; normally, these would serve a public need and benefit larger in scope than an individual development project.

Typical BMPs:

- Biofilters
- Detention Basins
- Wet Ponds and Wetlands
- Retrofit public Storm Drain Inserts, Oil/Water separator, Catch basin insert & screens.
- Filtration Systems
- Hydrodynamic Separators

Mechanisms to Assure Maintenance:

3. Dedication of BMP to County: The developer would be required to dedicate the BMP (and the property on which it is located) to the County. This could be an immediate dedication, or for cases where the County would not want to assume responsibility for the facility for some time (e.g., until after construction is completed), then an IOD could be used instead.
4. County Maintenance Documentation: Internal County or Flood Control District maintenance program documentation would memorialize the required maintenance.

Funding:

A permanent source will be implemented; options include gas tax, TransNet, General Fund, or new special taxes or fees.

► DETERMINATION OF APPROPRIATE MAINTENANCE MECHANISM(S):

**Table 5.1 Determinations of Appropriate Maintenance Mechanism(s)**

Increased risk, complexity, cost or other maintenance factors				
(Private Responsibility)			(Public Responsibility)	
	First Category	Second Category	Third Category	Fourth Category
Importance of Maintenance	Minimal concern; inherent in BMP or property stewardship	Need to make sure private owners maintain, and provide County ability to step in & perform maintenance	Warrants Flood Control Dist. (FCD) assuming responsibility, with funding related to project	Broader public responsibility for maintenance and funding (beyond project)
Typical BMPs	Biofilter (Grass swale, grass strip, vegetated buffer);  Infiltration basin/trench	[First cat. plus:] Minor wetland swale; Small detention basin; Single storm drain insert / Oil-water separator / Catch basin insert & screen	[Second cat. plus:] Wetland swale or bioretention; Detention basin (extended/dry); Wet ponds & wetlands; Multiple storm drain inserts; Filtration Systems	[Third cat. plus:] Retrofit public storm drain inserts, etc. Master plan facility that serves area larger than project
Mechanisms	1. Stormwater Ordinance* requirement [section 67.813(a)&(b)], with code enforcement 2. Nuisance abatement with costs charged back to property owner 3. Condition in ongoing permit such as a Major Use Permit (if project has MUP) 4. Notice to new purchasers [67.813(e)] 5. Subdivision public report “white papers” to include notice of maintenance responsibility		1. Dedication to FCD. 2. Formation of benefit area 3. FCD maintenance documentation	1. Dedication to FCD or County. 2. FCD / County maintenance documentation
	6. Recorded easement agreement with covenant binding on successors			
Funding Source(s)	None necessary	Security (Cash deposit, Letter of Credit, or other acceptable to County) for interim period. Agreement for security to contain provisions for release or refund, if not used.	Start-up interim: Developer fee covering 24 months of costs Permanent: FCD Assessment per FCD Act Sec 105-17.5	Varies: gas tax for BMP in road ROW, Transnet for CIP projects, Special funding or General funding for others.

\* County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (S.D.Co.Code Sec. 67.801 et seq.)

## ► COUNTY REVIEW OF MAINTENANCE PLAN

County staff reviews the Operation and Maintenance Plan as part of the overall project application and for compliance with the WPO. These reviews include the departments of Public Works for engineering and cost estimates and Planning & Land Use for environmental concerns. Information from the maintenance plan shall be used in formulating CEQA responses and findings, findings of project code compliance, and in proposing conditions for the project. The County has the final authority for deciding what is required in the maintenance plan and when a proposed maintenance plan is adequate.

Staff reviewing the maintenance proposals will pay careful attention to the BMPs proposed, to:

- a) Select the appropriate BMPs in view of ongoing maintenance costs; and
- b) Determine whether it is appropriate for the BMPs to remain in private ownership and responsibility, or to be taken over by the County (or Flood Control District).

## Stage 2: General Maintenance Requirements

Include in your SWMP a general description of anticipated facility maintenance requirements. This will help ensure that:

- Ongoing costs of maintenance have been considered in your facility selection and design.
- Site and landscaping plans provide for access for inspections and by maintenance equipment.
- Landscaping plans incorporate irrigation requirements for facility plantings.
- Initial maintenance and replacement of facility plantings is incorporated into landscaping contracts and guarantees.

Fact sheets available on the Project Clean Water web page describe general maintenance requirements for the types of stormwater facilities featured in the LID Design Guide (Chapter 4). You can use this information to specify general maintenance requirements in your SWMP.

Maintenance fact sheets for conventional stormwater facilities are available in the California Stormwater BMP Handbooks.

## Stage 3: Detailed Maintenance Plan

Prepare a detailed maintenance plan and submit it as required by the County. Include a maintenance plan with the initial SWMP and incorporate solutions to any problems or changes that occurred during project construction.

Your final maintenance plan should be kept on-site for use by maintenance personnel and during site inspections.

### ► YOUR DETAILED MAINTENANCE PLAN: STEP BY STEP

The following step-by-step guidance will help you prepare your detailed maintenance plan.

Preparation of the plan will require familiarity with your stormwater facilities as they have been or will be constructed and a fair amount of “thinking through” plans for their operation and maintenance.

### ► STEP 1: DESIGNATE RESPONSIBLE INDIVIDUALS

To begin creating your detailed maintenance plan, designate and identify:

- The individual who will have direct responsibility for the maintenance of stormwater controls. This individual should be the designated contact with County inspectors and should sign self-inspection reports and any correspondence with the County regarding verification inspections.
- Employees or contractors who will report to the designated contact and are responsible for carrying out BMP operation and maintenance.
- The corporate officer authorized to negotiate and execute any contracts that might be necessary for future changes to operation and maintenance or to implement remedial measures if problems occur.
- Your designated respondent to problems, such as clogged drains or broken irrigation mains, that would require immediate response should they occur during off-hours.

Updated contact information must be provided to the County immediately whenever a property is sold and whenever designated individuals or contractors change.

Draw or sketch an organization chart to show the relationships of authority and responsibility between the individuals responsible for maintenance. This need not be elaborate, particularly for smaller organizations.

Describe how funding for BMP operation and maintenance will be assured, including sources of funds, budget category for expenditures, process for establishing the annual maintenance budget, and process for obtaining authority should unexpected expenditures for major corrective maintenance be required.



Describe how your organization will accommodate initial training of staff or contractors regarding the purpose, mode of operation, and maintenance requirements for the stormwater facilities on your site. Also, describe how your organization will ensure ongoing training as needed and in response to staff changes.

► STEP 2: SUMMARIZE DRAINAGE AND BMPS

Incorporate the following information from your SWMP into your maintenance plan:

- Figures delineating and designating pervious and impervious areas.
- Figures showing locations of stormwater facilities on the site.
- Tables of pervious and impervious areas served by each facility.

Review the SWMP narrative, if any, that describes each facility and its tributary drainage area and update the text to incorporate any changes that may have occurred during planning and zoning review, building permit review, or construction. Incorporate the updated text into your maintenance plan.

► STEP 3: DOCUMENT FACILITIES “AS BUILT”

Include the following information from final construction drawings:

- Plans, elevations, and details of all facilities. Annotate if necessary with designations used in the initial SWMP.
- Design information or calculations submitted in the detailed design phase (i.e., not included in the initial SWMP.)
- Specifications of construction for facilities, including sand or soil, compaction, pipe materials and bedding.

In the maintenance plan, note field changes to design drawings, including changes to any of the following:

- Location and layouts of inflow piping, flow splitter boxes, and piping to off-site discharge
- Depths and layering of soil, sand, or gravel
- Placement of filter fabric or geotextiles
- Changes or substitutions in soil or other materials.
- Natural soils encountered (e.g., sand or clay lenses)

► STEP 4: PREPARE MAINTENANCE PLANS FOR EACH FACILITY

Prepare a maintenance plan, schedule, and inspection checklists (routine, annual, and after major storms) for each facility. Plans and schedules for two or more similar facilities on the same site may be combined.

Use the following resources to prepare your customized maintenance plan, schedule, and checklists.

- Specific information noted in Steps 2 and 3, above.
- Other input from the facility designer, County staff, or other sources.
- Operation and Maintenance Fact Sheets (available on the Project Clean Water website).

Note any particular characteristics or circumstances that could require attention in the future, and include any troubleshooting advice.

Also include manufacturer's data, operating manuals, and maintenance requirements for any:

- Pumps or other mechanical equipment.
- Proprietary devices used as BMPs.

Manufacturers' publications should be referenced in the text (including models and serial numbers where available). Copies of the manufacturers' publications should be included as an attachment in the back of your maintenance plan or as a separate document.

## ► STEP 5: COMPILE MAINTENANCE PLAN

The following general outline is provided as an example. Check with the County for specific requirements.

- I. Inspection and Maintenance Log
- II. Updates, Revisions and Errata
- III. Introduction
  - A. Narrative overview describing the site; drainage areas, routing, and discharge points; and treatment facilities.
- IV. Responsibility for Maintenance
  - A. General
    - (1) Name and contact information for responsible individual(s).
    - (2) Organization chart or charts showing organization of the maintenance function and location within the overall organization.
    - (3) Reference to Operation and Maintenance Agreement (if any). A copy of the agreement should be attached.
    - (4) Maintenance Funding
      - (1) Sources of funds for maintenance
      - (2) Budget category or line item
      - (3) Description of procedure and process for ensuring adequate funding for maintenance
  - B. Staff Training Program
  - C. Records
  - D. Safety
- V. Summary of Drainage Areas and Stormwater Facilities
  - A. Drainage Areas
    - (1) Drawings showing pervious and impervious areas (copied or adapted from initial SWMP).
    - (2) Designation and description of each drainage area and how flow is routed to the corresponding facility.

## B. Treatment and Flow-Control Facilities

- (1) Drawings showing location and type of each facility
- (2) General description of each facility (Consider a table if more than two facilities)
  - (1) Area drained and routing of discharge.
  - (2) Facility type and size

## VI. Facility Documentation

- A. “As-built” drawings of each facility (design drawings in the draft Plan)
- B. Manufacturer’s data, manuals, and maintenance requirements for pumps, mechanical or electrical equipment, and proprietary facilities (include a “placeholder” in the draft plan for information not yet available).
- C. Specific operation and maintenance concerns and troubleshooting

## VII. Maintenance Schedule or Matrix

- A. Maintenance Schedule for each facility with specific requirements for:
  - (1) Routine inspection and maintenance
  - (2) Annual inspection and maintenance
  - (3) Inspection and maintenance after major storms
- B. Service Agreement Information

Assemble and make copies of your maintenance plan. One copy must be submitted to the County, and at least one copy kept on-site. Here are some suggestions for formatting the maintenance plan:

- Format plans to 8½" x 11" to facilitate duplication, filing, and handling.
- Include the revision date in the footer on each page.
- Scan graphics and incorporate with text into a single electronic file. Keep the electronic file backed-up so that copies of the maintenance plan can be made if the hard copy is lost or damaged.

## ► STEP 6: UPDATES

Your maintenance plan will be a living document.

Operation and maintenance personnel may change; mechanical equipment may be replaced, and additional maintenance procedures may be needed. Throughout these changes, the maintenance plan must be kept up-to-date.

Updates may be transmitted to the County at any time. However, at a minimum, updates to the maintenance plan must accompany the annual inspection report.

## Stage 4: Interim Maintenance

Applicants will typically be required to warranty stormwater facilities against lack of performance due to flaws in design or construction. The warranty may need to be secured by a bond or other financial instrument.

## Stage 5: Transfer Responsibility

As part of the detailed maintenance plan, note the expected date when responsibility for operation and maintenance will be transferred. Notify the County when this transfer of responsibility takes place.

## Stage 6: Operation & Maintenance Verification

The County implements an operation and maintenance verification program, including periodic site inspections.

Contact County staff to determine the frequency of inspections, whether self-inspections are allowed, and applicable fees, if any.

### References and Resources

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- *Stormwater Management Manual* (Portland, 2004). Chapter 3.
- *California Storm Water Best Management Practice Handbooks* (CASQA, 2003).
- *Best Management Practices Guide* (Public Telecommunications Center for [Hampton Roads](#), 2002).
- Operation, Maintenance, and Management of Stormwater Management Systems (Watershed Management Institute, 1997)

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Puget Sound Action Team. 2005. *Low Impact Development Technical Guidance Manual for Puget Sound*. [http://www.psat.wa.gov/Publications/LID\\_tech\\_manual05/lid\\_index.htm](http://www.psat.wa.gov/Publications/LID_tech_manual05/lid_index.htm)

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Watershed Management Institute. 1997. *Operation, Maintenance, and Management of Stormwater Management Systems*.

WEF/ASCE. 1998. Water Environment Foundation/American Society of Civil Engineers. *Urban Runoff Quality Management*. WEF Manual of Practice No. 23, ASCE Manual and Report on Engineering Practice No. 87. ISBN 1-57278-039-8 ISBN 0-7844-0174-8. 259 pp. Access: Order from WEF or ASCE, [www.wef.org](http://www.wef.org) or [www.asce.org](http://www.asce.org).

## **APPENDIX A**

### **COUNTY ENVIRONMENTALLY SENSITIVE AREAS MAP**

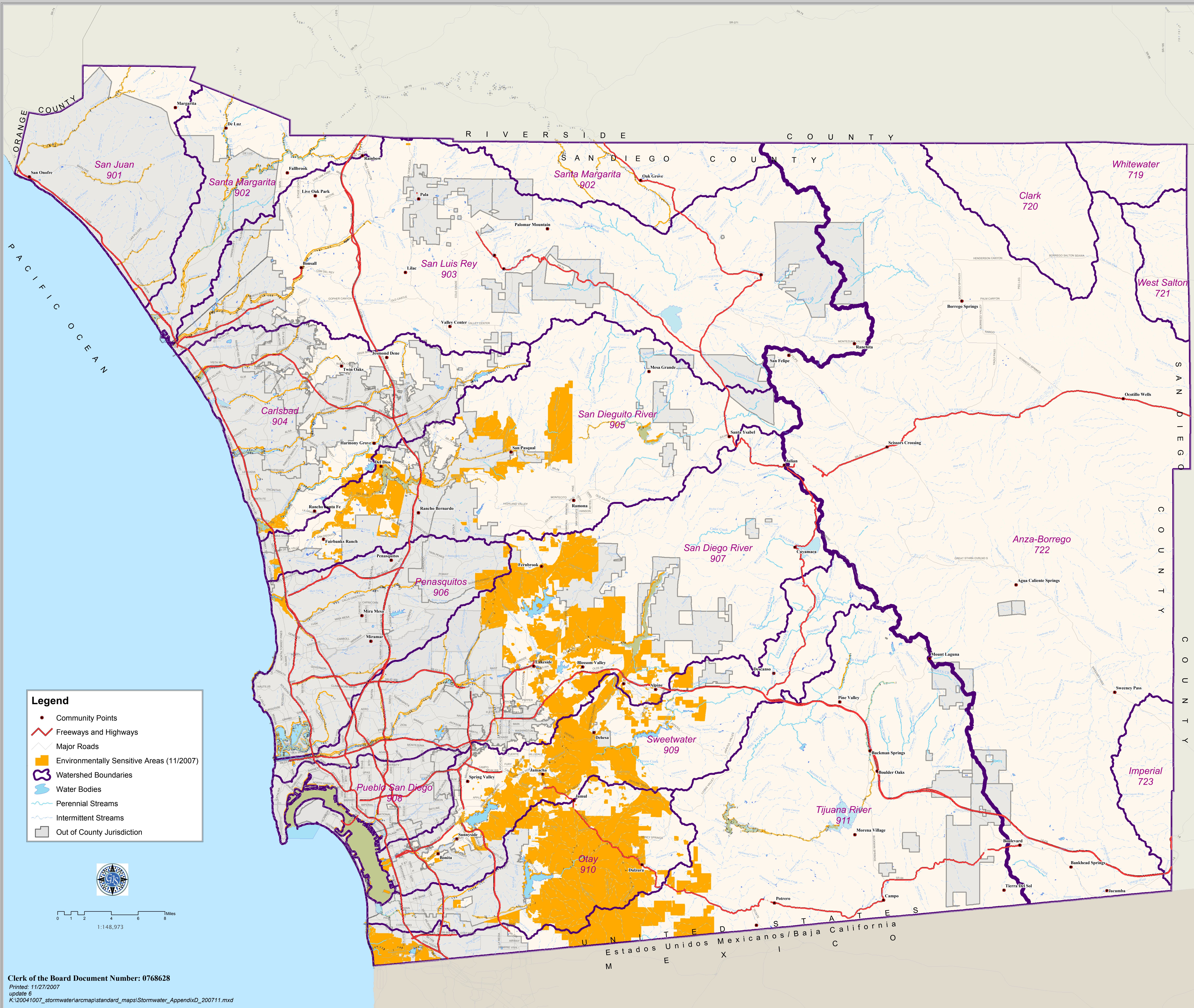




# Appendix A - Environmentally Sensitive Areas

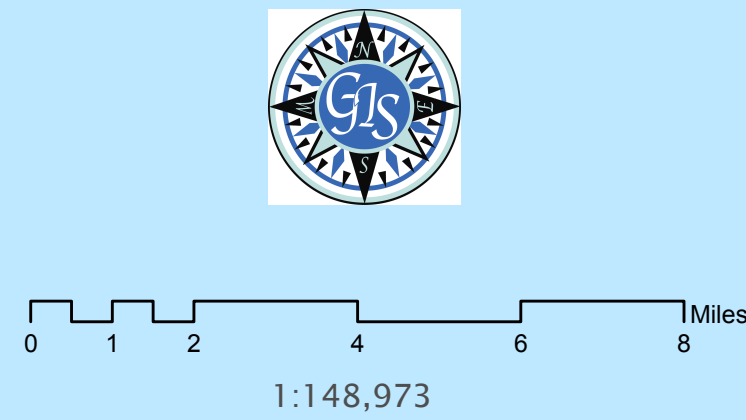


THIS MAP IS PROVIDED WITHOUT WARRANTY OF ANY KIND. IT IS THE USER'S RESPONSIBILITY TO VERIFY THE ACCURACY OF THE INFORMATION SHOWN ON THIS MAP. THE COUNTY OF SAN DIEGO AND ITS AGENTS AND EMPLOYEES SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING REASONABLE ATTORNEY'S FEES, ARISING OUT OF OR FROM THE USE OF THIS MAP. THE COUNTY OF SAN DIEGO AND ITS AGENTS AND EMPLOYEES SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING REASONABLE ATTORNEY'S FEES, ARISING OUT OF OR FROM THE USE OF THIS MAP.



**Legend**

- Community Points
- Freeways and Highways
- Major Roads
- Environmentally Sensitive Areas (11/2007)
- Watershed Boundaries
- Water Bodies
- Perennial Streams
- Intermittent Streams
- Out of County Jurisdiction



Clerk of the Board Document Number: 0768628  
Printed: 11/27/2007  
Update: 6  
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## **APPENDIX B**

### **STORMWATER INTAKE FORM FOR DEVELOPMENT PROJECTS**



County of San Diego

# STORMWATER INTAKE FORM FOR DEVELOPMENT PROJECTS

This form must be completed in its entirety and accompany applications for any of the discretionary or ministerial permits and approvals referenced in Sections 67.803(c)(1) and 67.803(c)(2) of the County of San Diego Watershed Protection, Stormwater Management and Discharge Control Ordinance (WPO).

## STEP 1: IDENTIFY RELEVANT PROJECT INFORMATION

Applicant Name:	Contact Information:
Project Address:	APN(s):
Permit Application Number:	

## STEP 2: DETERMINE PRIORITY DEVELOPMENT PROJECT STATUS

WPO Section 67.802(w) defines the criteria for determining whether your project is considered a Priority Development Project (PDP). First, select the proposed project type category. Then select "Yes" or "No" for all of the categories in Table A, Priority Development Project Categories. If you answer "Yes" for any of the categories in Table A, your project is a PDP subject to review and approval of a Major Stormwater Management Plan (SWMP). If you answer "No" to all of the categories in Table A, your project is subject to review and approval of a Minor SWMP.

☐ **New Development Project:**

Projects on previously undeveloped land are Priority Development Projects if they are in one or more of the categories listed below.

☐ **Previously Developed Site:**

Projects on previously developed sites ("redevelopment projects") are Priority Development Projects if they create, add, or replace 5,000 sq. ft. or more of impervious surface and also are in one of the categories listed below.

☐ **Pollutant Generating Project:**

Projects that generate pollutants at levels greater than background levels which disturb one acre or more of land and include housing subdivisions of 10 or more dwelling units are considered Priority Development Projects.

If project is exempt please list the exemption: \_\_\_\_\_

**\*PROJECT WILL STILL NEED TO COMPLETE A MINOR SWMP**

**If you answer "YES" for any category in Table A, please complete a Major SWMP for your project.**

Instructions and an example of the form can be downloaded from:

[http://www.co.san-diego.ca.us/dpw/watersheds/land\\_dev/susmp.html](http://www.co.san-diego.ca.us/dpw/watersheds/land_dev/susmp.html)

**If you answer "NO" to all of the categories in Table A, please complete a Minor SWMP for your project.**

Instructions and an example of the form can be downloaded from:

<http://www.sdcountry.ca.gov/dplu/docs/LUEG-SW.pdf>

**TABLE A:  
PRIORITY DEVELOPMENT PROJECT CATEGORIES**

Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>A</b>	<b>Housing subdivisions of 10 or more dwelling units.</b> Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>B</b>	<b>Commercial - greater than one acre.</b> Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>C</b>	<b>Heavy industry - greater than one acre.</b> Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>D</b>	<b>Automotive repair shops.</b> A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>E</b>	<b>Restaurants.</b> Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 sq. ft.. Restaurants where land development is less than 5,000 sq. ft. shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>F</b>	<b>Hillside development greater than 5,000 square feet.</b> Any development that creates 5,000 sq. ft. of impervious surface located in an area with known erosive soil conditions, where development will grade on any natural slope that is 25% or greater. <sup>(1)</sup>
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>G</b>	<b>Environmentally Sensitive Areas (ESAs).</b> 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 sq. ft. 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. <sup>(1)</sup> <sup>(2)</sup>
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>H</b>	<b>Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff. <sup>(3)</sup></b>
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>I</b>	<b>Street, roads, highways, and freeways.</b> Any paved surface $\geq$ 5,000 sq. ft. used for transportation of automobiles, trucks, motorcycles, and other vehicles. <sup>(3)</sup>
Yes <input type="checkbox"/>	No <input type="checkbox"/>	<b>J</b>	<b>Retail Gasoline Outlets (RGOs) that are:</b> (a) $\geq$ 5,000 sq. ft. or (b) projected Average Daily Traffic (ADT) $\geq$ 100 vehicles per day.

<sup>(1)</sup> In lieu of a Major SWMP, Ministerial Permit Applications for residential dwellings/additions on an existing legal lot answering "Yes" may be able to utilize the Minor SWMP upon approval of a county official. Please note that upon further analysis, staff may determine that a Major SWMP will be required.

<sup>(2)</sup> Counter staff will assist you in determining whether your project is located within 200 feet of an Environmentally Sensitive Area.

<sup>(3)</sup> PDP Exemptions: interior remodels, trenching and resurfacing associated with utility work, routine maintenance or repair, roof or exterior surface replacement, resurfacing and reconfiguring surface parking lots and existing roadways, new sidewalk construction, pedestrian ramps, or bike lanes on existing roads, and routine replacement of damaged pavement such as pothole repair.

### STEP 3: SIGN AND DATE THE CERTIFICATION

**APPLICANT CERTIFICATION:** I have read and understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including stormwater, from construction and land development activities. I certify that this intake form has been completed to the best of my ability and accurately reflects the project being proposed. I also understand that non-compliance with the County's WPO and Grading Ordinance may result in enforcement by the County, including fines, cease and desist orders, or other actions.

Applicant: \_\_\_\_\_

Date: \_\_\_\_\_

**APPENDIX C**

**MAJOR SWMP FORM**

**Major Stormwater Management Plan  
(Major SWMP)  
For  
*(Insert Project Name)***

**Preparation/Revision Date:**

**Prepared for:**

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

**Prepared by:**

Name and Title of Preparer  
Company Name  
Street Address  
City, State Zip  
Telephone:

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan have been prepared under the direction of the following Registered Civil Engineer and meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

---

Name, RCE #

---

Date

The Major Stormwater Management Plan (Major SWMP) must be completed in its entirety and accompany applications to the County for a permit or approval associated with certain types of development projects. To determine whether your project is required to submit a Major or Minor SWMP, please reference the County's Stormwater Intake Form for Development Projects.

Project Name:	
Project Location:	
Permit Number (Land Development Projects):	
Work Authorization Number ( <b>CIP only</b> ):	
Applicant:	
Applicant's Address:	
Plan Prepared By ( <i>Leave blank if same as applicant</i> ):	
Preparer's Address:	
Date:	

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9926) requires all applications for a permit or approval associated with a Land Disturbance Activity to be accompanied by a Storm Water Management Plan (SWMP) (section 67.806.b). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority development project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

Project Stages	Does the SWMP need revisions?		If YES, Provide Revision Date
	YES	NO	

Instructions for a Major SWMP can be downloaded at  
<http://www.sdcounty.ca.gov/dpw/watersheds/susmp/susmp.html>

Completion of the following checklists and attachments will fulfill the requirements of a Major SWMP for the project listed above.

## STEP 1

### PRIORITY DEVELOPMENT PROJECT DETERMINATION

TABLE 1: IS THE PROJECT IN ANY OF THESE CATEGORIES?

Yes <input type="checkbox"/>	No <input type="checkbox"/>	A	Housing subdivisions of 10 or more dwelling units. Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	B	Commercial—greater than one acre. Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	C	Heavy industry—greater than one acre. Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes <input type="checkbox"/>	No <input type="checkbox"/>	D	Automotive repair shops. A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	E	Restaurants. Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	F	Hillside development greater than 5,000 square feet. Any development that creates 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	G	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.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	H	Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	I	Street, roads, highways, and freeways. Any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	J	Retail Gasoline Outlets (RGOs) that are: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

To use the table, review each definition A through K. If any of the definitions match, the project is a Priority Development Project. Note some thresholds are defined by square footage of impervious area created; others by the total area of the development. Please see special requirements for previously developed sites and project exemptions on page 6 of the County SUSMP.



## **STEP 2**

### PROJECT STORMWATER QUALITY DETERMINATION

Total Project Site Area \_\_\_\_\_ (Acres or ft<sup>2</sup>)

Estimated amount of disturbed acreage: \_\_\_\_\_ (Acres or ft<sup>2</sup>)

(If >1 acre, you must also provide a WDID number from the SWRCB) WDID: \_\_\_\_\_

Complete A through C and the calculations below to determine the amount of impervious surface on your project before and after construction.

A. Total size of project site: \_\_\_\_\_ (Acres or ft<sup>2</sup>)

B. Total impervious area (including roof tops) before construction \_\_\_\_\_ (Acres or ft<sup>2</sup>)

C. Total impervious area (including roof tops) after construction \_\_\_\_\_ (Acres or ft<sup>2</sup>)

Calculate percent impervious before construction:  $B/A =$  \_\_\_\_\_ %

Calculate percent impervious after construction:  $C/A =$  \_\_\_\_\_ %

Please provide detailed descriptions regarding the following questions:

TABLE 2: PROJECT SPECIFIC STORMWATER ANALYSIS

1.	Please provide a brief description of the project.	
2.	Describe the current and proposed zoning and land use designation.	
3.	Describe the pre-project and post-project topography of the project. (Show on Plan)	
4.	Describe the soil classification, permeability, erodibility, and depth to groundwater for LID and Treatment BMP consideration. (Show on Plan) If infiltration BMPs are proposed, a Geotechnical Engineer must certify infiltration BMPs in Attachment E.	
5.	Describe if contaminated or hazardous soils are within the project area. (Show on Plan)	
6.	Describe the existing site drainage and natural hydrologic features. (Show on Plan).	
7.	Describe site features and conditions that constrain, or provide opportunities for stormwater control, such as LID features.	
8.	Is this project within the environmentally sensitive areas as defined on the maps in Appendix A of the <i>County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects</i> ?	
Yes		No
9.	Is this an emergency project?	
Yes		No

## CHANNELS & DRAINAGES

Complete the following checklist to determine if the project includes work in channels.

TABLE 3: PROJECT SPECIFIC STORMWATER ANALYSIS

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project include work in channels?				If YES go to 2 If NO go to 13.
2.	Will the project increase velocity or volume of downstream flow?				If YES go to 6.
3.	Will the project discharge to unlined channels?				If YES go to 6.
4.	Will the project increase potential sediment load of downstream flow?				If YES go to 6.
5.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?				If YES go to 8.
6.	Review channel lining materials and design for stream bank erosion.				Continue to 7.
7.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.				Continue to 8.
8.	Include, where appropriate, energy dissipation devices at culverts.				Continue to 9.
9.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.				Continue to 10.
10.	Include, if appropriate, detention facilities to reduce peak discharges.				Continue to 11.
11.	“Hardening” natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.				Continue to 12.
12.	Provide other design principles that are comparable and equally effective.				Continue to 13.
13.	End				

### **TEMPORARY CONSTRUCTION BMPs**

Please check the construction BMPs that may be implemented during construction of the project. The applicant will be responsible for the placement and maintenance of the BMPs incorporated into the final project design.

- |   |   |
|---|---|
| <input type="checkbox"/> Silt Fence   | <input type="checkbox"/> Desilting Basin                |
| <input type="checkbox"/> Fiber Rolls  | <input type="checkbox"/> Gravel Bag Berm                |
| <input type="checkbox"/> Street Sweeping and Vacuuming  | <input type="checkbox"/> Sandbag Barrier                |
| <input type="checkbox"/> Storm Drain Inlet Protection   | <input type="checkbox"/> Material Delivery and Storage  |
| <input type="checkbox"/> Stockpile Management   | <input type="checkbox"/> Spill Prevention and Control   |
| <input type="checkbox"/> Solid Waste Management   | <input type="checkbox"/> Concrete Waste Management      |
| <input type="checkbox"/> Stabilized Construction Entrance/Exit  | <input type="checkbox"/> Water Conservation Practices   |
| <input type="checkbox"/> Dewatering Operations  | <input type="checkbox"/> Paving and Grinding Operations |
| <input type="checkbox"/> Vehicle and Equipment Maintenance  |   |
| <input type="checkbox"/> Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval. |   |

## EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

Complete the checklist below to determine if a proposed project will pose an “exceptional threat to water quality,” and therefore require Advanced Treatment Best Management Practices during the construction phase.

TABLE 4: EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

No.	CRITERIA	YES	NO	INFORMATION
1.	Is all or part of the proposed project site within 200 feet of waters named on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity? Current 303d list may be obtained from the following site: <a href="http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf">http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf</a>			If YES, continue to 2. If NO, go to 5.
2.	Will the project disturb more than 5 acres, including all phases of the development?			If YES, continue to 3. If NO, go to 5.
3.	Will the project disturb slopes that are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and that drain toward the 303(d) listed receiving water for sedimentation and/or turbidity?			If YES, continue to 4. If NO, go to 5.
4.	Will the project disturb soils with a predominance of USDA-NRCS Erosion factors $k_f$ greater than or equal to 0.4?			If YES, continue to 6. If NO, go to 5.
5.	Project is not required to use Advanced Treatment BMPs.			Document for Project Files by referencing this checklist.
6.	Project poses an “exceptional threat to water quality” and is required to use Advanced Treatment BMPs.			Advanced Treatment BMPs must be consistent with WPO section 67.811(b)(20)(D) performance criteria

**Exemption potentially available for projects that require advanced treatment:** Project proponent may perform a Revised Universal Soil Loss Equation, Version 2 (RUSLE 2), Modified Universal Soil Loss Equation (MUSLE), or similar analysis that shows to the County official’s satisfaction that advanced treatment is not required

## STEP 3

### HYDROMODIFICATION DETERMINATION

The following questions provide a guide to collecting information relevant to hydromodification management issues.

TABLE 5: HYDROMODIFICATION DETERMINATION

	QUESTIONS	YES	NO	Information
1.	Will the proposed project disturb 50 or more acres of land? (Including all phases of development)			If YES, continue to 2. If NO, go to 6.
2.	Would the project site discharge directly into channels that are concrete-lined or significantly hardened such as with rip-rap, sackcrete, etc, downstream to their outfall into bays or the ocean?			If NO, continue to 3. If YES, go to 6.
3.	Would the project site discharge directly into underground storm drains discharging directly to bays or the ocean?			If NO, continue to 4. If YES, go to 6.
4.	Would the project site discharge directly to a channel (lined or un-lined) and the combined impervious surfaces downstream from the project site to discharge at the ocean or bay are 70% or greater?			If NO, continue to 5. If YES, go to 6.
5.	Project is required to manage hydromodification impacts.			Hydromodification Management Required as described in Section 67.812 b(4) of the WPO.
6.	Project is not required to manage hydromodification impacts.			Hydromodification Exempt. Keep on file.

**An exemption is potentially available for projects that are required (No. 5. in Table 5 above) to manage hydromodification impacts:** The project proponent may conduct an independent geomorphic study to determine the project's full hydromodification impact. The study must incorporate sediment transport modeling across the range of geomorphically-significant flows and demonstrate to the County's satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water to qualify for the exemption.

## STEP 4

### POLLUTANTS OF CONCERN DETERMINATION

#### WATERSHED

Please check the watershed(s) for the project.

<input type="checkbox"/> San Juan 901	<input type="checkbox"/> Santa Margarita 902	<input type="checkbox"/> San Luis Rey 903	<input type="checkbox"/> Carlsbad 904
<input type="checkbox"/> San Dieguito 905	<input type="checkbox"/> Penasquitos 906	<input type="checkbox"/> San Diego 907	<input type="checkbox"/> Sweetwater 909
<input type="checkbox"/> Otay 910	<input type="checkbox"/> Tijuana 911	<input type="checkbox"/> Whitewater 719	<input type="checkbox"/> Clark 720
<input type="checkbox"/> West Salton 721	<input type="checkbox"/> Anza Borrego 722	<input type="checkbox"/> Imperial 723	

[http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/basin\\_plan/index.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml)

#### HYDROLOGIC SUB-AREA NAME AND NUMBER(S)

Number	Name

[http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/basin\\_plan/index.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml)

**SURFACE WATERS** that each project discharge point proposes to discharge to. List the impairments identified in Table 7.

SURFACE WATERS (river, creek, stream, etc.)	Hydrologic Unit Basin Number	Impairment(s) listed [303(d) listed waters or waters with established TMDLs ]	Distance to Project

[http://www.waterboards.ca.gov/water\\_issues/programs/tmdl/docs/303dlists2006/epa/r9\\_06\\_303d\\_reqtmls.pdf](http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r9_06_303d_reqtmls.pdf)

#### GROUND WATERS

Ground Waters	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN

[http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/basin\\_plan/index.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml)

+ Excepted from Municipal

● Existing Beneficial Use

○ Potential Beneficial Use

## PROJECT ANTICIPATED AND POTENTIAL POLLUTANTS

Using Table 6, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

TABLE 6: ANTICIPATED AND POTENTIAL POLLUTANTS GENERATED BY LAND USE TYPE

	<i>General Pollutant Categories</i>								
<i><b>PDP Categories</b></i>	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P <sup>(1)</sup>	P <sup>(2)</sup>	P	X
Commercial Development 1 acre or greater	P <sup>(1)</sup>	P <sup>(1)</sup>		P <sup>(2)</sup>	X	P <sup>(5)</sup>	X	P <sup>(3)</sup>	P <sup>(5)</sup>
Heavy industry /industrial development	X		X	X	X	X	X		
Automotive Repair Shops			X	X <sup>(4)(5)</sup>	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft <sup>2</sup>	X	X			X	X	X		X
Parking Lots	P <sup>(1)</sup>	P <sup>(1)</sup>	X		X	P <sup>(1)</sup>	X		P <sup>(1)</sup>
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P <sup>(1)</sup>	X	X <sup>(4)</sup>	X	P <sup>(5)</sup>	X		

X = anticipated

P = potential

(1) A potential pollutant if landscaping exists on-site.

(2) A potential pollutant if the project includes uncovered parking areas.

(3) A potential pollutant if land use involves food or animal waste products.

(4) Including petroleum hydrocarbons.

(5) Including solvents.



## PROJECT POLLUTANTS OF CONCERN SUMMARY TABLE

Please summarize the identified project pollutant of concern by checking the appropriate boxes in the table below and list any surface water impairments identified. Pollutants anticipated to be generated by the project, which are also causing impairment of receiving waters, shall be considered the primary pollutants of concern. For projects where no primary pollutants of concern exist, those pollutants identified as anticipated shall be considered secondary pollutants of concern.

TABLE 7: PROJECT POLLUTANTS OF CONCERN

<b>Pollutant Category</b>	<b>Anticipated (X)</b>	<b>Potential (P)</b>	<b>Surface Water Impairments</b>
Sediments			
Nutrients			
Heavy Metals			
Organic Compounds			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

## STEP 5

### LID AND SITE DESIGN STRATEGIES

Each numbered item below is a Low Impact Development (LID) requirement of the WPO. Please check the box(s) under each number that best describes the LID BMP(s) and Site Design Strategies selected for this project.

TABLE 8: LID AND SITE DESIGN

1.	Conserve natural Areas, Soils, and Vegetation
<input type="checkbox"/>	Preserve well draining soils (Type A or B)
<input type="checkbox"/>	Preserve Significant Trees
<input type="checkbox"/>	Preserve critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions
<input type="checkbox"/>	Other. Description:
2.	Minimize Disturbance to Natural Drainages
<input type="checkbox"/>	Set-back development envelope from drainages
<input type="checkbox"/>	Restrict heavy construction equipment access to planned green/open space areas
<input type="checkbox"/>	Other. Description:
3.	Minimize and Disconnect Impervious Surfaces (see 5)
<input type="checkbox"/>	Clustered Lot Design
<input type="checkbox"/>	Items checked in 5?
<input type="checkbox"/>	Other. Description:
4.	Minimize Soil Compaction
<input type="checkbox"/>	Restrict heavy construction equipment access to planned green/open space areas
<input type="checkbox"/>	Re-till soils compacted by construction vehicles/equipment
<input type="checkbox"/>	Collect & re-use upper soil layers of development site containing organic Materials
<input type="checkbox"/>	Other. Description:
5.	Drain Runoff from Impervious Surfaces to Pervious Areas
	<u>LID Street &amp; Road Design</u>
<input type="checkbox"/>	Curb-cuts to landscaping
<input type="checkbox"/>	Rural Swales
<input type="checkbox"/>	Concave Median
<input type="checkbox"/>	Cul-de-sac Landscaping Design
<input type="checkbox"/>	Other. Description:
	<u>LID Parking Lot Design</u>
<input type="checkbox"/>	Permeable Pavements

<input type="checkbox"/>	Curb-cuts to landscaping
<input type="checkbox"/>	Other. Description:
<u>LID Driveway, Sidewalk, Bike-path Design</u>	
<input type="checkbox"/>	Permeable Pavements
<input type="checkbox"/>	Pitch pavements toward landscaping
<input type="checkbox"/>	Other. Description:
<u>LID Building Design</u>	
<input type="checkbox"/>	Cisterns & Rain Barrels
<input type="checkbox"/>	Downspout to swale
<input type="checkbox"/>	Vegetated Roofs
<input type="checkbox"/>	Other. Description:
<u>LID Landscaping Design</u>	
<input type="checkbox"/>	Soil Amendments
<input type="checkbox"/>	Reuse of Native Soils
<input type="checkbox"/>	Smart Irrigation Systems
<input type="checkbox"/>	Street Trees
<input type="checkbox"/>	Other. Description:
6.	Minimize erosion from slopes
<input type="checkbox"/>	Disturb existing slopes only when necessary
<input type="checkbox"/>	Minimize cut and fill areas to reduce slope lengths
<input type="checkbox"/>	Incorporate retaining walls to reduce steepness of slopes or to shorten slopes
<input type="checkbox"/>	Provide benches or terraces on high cut and fill slopes to reduce concentration of flows
<input type="checkbox"/>	Rounding and shaping slopes to reduce concentrated flow
<input type="checkbox"/>	Collect concentrated flows in stabilized drains and channels
<input type="checkbox"/>	Other. Description:

## **STEP 6**

### **SOURCE CONTROL**

Please complete the checklist on the following pages to determine Source Control BMPs. Below is instruction on how to use the checklist. (Also see instructions on page 40 of the *SUSMP*)

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Source Control Exhibit in Attachment B.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your Project-Specific SUSMP.

Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

--

Use the format in Table 9 below to summarize the project Source Control BMPs. Incorporate all identified Source Control BMPs in your Source Control Exhibit in Attachment B.

TABLE 9: PROJECT SOURCE CONTROL BMPS

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> A. On-site storm drain inlets	<input type="checkbox"/> Locations of inlets.	<input type="checkbox"/> Mark all inlets with the words “No Dumping! Flows to Bay” or similar.	<input type="checkbox"/> Maintain and periodically repaint or replace inlet markings. <input type="checkbox"/> Provide stormwater pollution prevention information to new site owners, lessees, or operators. <input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-44, “Drainage System Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> <input type="checkbox"/> Include the following in lease agreements: “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains.”
<input type="checkbox"/> B. Interior floor drains and elevator shaft sump pumps		<input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	<input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.
<input type="checkbox"/> C. Interior parking garages		<input type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.	<input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> D1. Need for future indoor & structural pest control		<input type="checkbox"/> Note building design features that discourage entry of pests.	<input type="checkbox"/> Provide Integrated Pest Management information to owners, lessees, and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> D2. Landscape/ Outdoor Pesticide Use  <u>Note: Should be consistent with project landscape plan (if applicable).</u>	<input type="checkbox"/> Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.  <input type="checkbox"/> Show self-retaining landscape areas, if any.  <input type="checkbox"/> Show stormwater treatment facilities.	<p>State that final landscape plans will accomplish all of the following:</p> <input type="checkbox"/> Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.  <input type="checkbox"/> Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.  <input type="checkbox"/> Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.  <input type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape.  <input type="checkbox"/> To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	<input type="checkbox"/> Maintain landscaping using minimum or no pesticides.  <input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>  <input type="checkbox"/> Provide IPM information to new owners, lessees and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> E. Pools, spas, ponds, decorative fountains, and other water features.	<input type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	<input type="checkbox"/> If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	<input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-72, “Fountain and Pool Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
<input type="checkbox"/> F. Food service	<input type="checkbox"/> For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.  <input type="checkbox"/> On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	<input type="checkbox"/> Describe the location and features of the designated cleaning area.  <input type="checkbox"/> Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	<input type="checkbox"/>



IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> G. Refuse areas	<input type="checkbox"/> Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.  <input type="checkbox"/> If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.  <input type="checkbox"/> Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	<input type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans.  <input type="checkbox"/> State that signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.	<input type="checkbox"/> State how the following will be implemented:  Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post “no hazardous materials” signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, “Waste Handling and Disposal” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
<input type="checkbox"/> H. Industrial processes.	<input type="checkbox"/> Show process area.	<input type="checkbox"/> If industrial processes are to be located on site, state: “All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.”	<input type="checkbox"/> See Fact Sheet SC-10, “Non-Stormwater Discharges” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	<input type="checkbox"/> Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.  <input type="checkbox"/> Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.  <input type="checkbox"/> Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	<input type="checkbox"/> Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.  Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: <ul style="list-style-type: none"> <li>▪ Hazardous Waste Generation</li> <li>▪ Hazardous Materials Release Response and Inventory</li> <li>▪ California Accidental Release (CalARP)</li> <li>▪ Aboveground Storage Tank</li> <li>▪ Uniform Fire Code Article 80 Section 103(b) &amp; (c) 1991</li> <li>▪ Underground Storage Tank</li> </ul>	<input type="checkbox"/> See the Fact Sheets SC-31, “Outdoor Liquid Container Storage” and SC-33, “Outdoor Storage of Raw Materials ” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>

<input type="checkbox"/> J. Vehicle and Equipment Cleaning	<input type="checkbox"/> Show on drawings as appropriate:  (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.  (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).  (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.  (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	<input type="checkbox"/> If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable):  <input type="checkbox"/> Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.  <input type="checkbox"/> Car dealerships and similar may rinse cars with water only.  <input type="checkbox"/> See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
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<p><input type="checkbox"/> K. Vehicle/Equipment Repair and Maintenance</p>	<p><input type="checkbox"/> Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.</p> <p><input type="checkbox"/> Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.</p> <p><input type="checkbox"/> Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.</p>	<p><input type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.</p> <p><input type="checkbox"/> State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.</p> <p><input type="checkbox"/> State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.</p>	<p>In the SUSMP report, note that all of the following restrictions apply to use the site:</p> <p><input type="checkbox"/> No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.</p> <p>No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.</p> <p><input type="checkbox"/> No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.</p>
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<p><input type="checkbox"/> L. Fuel Dispensing Areas</p>	<p><input type="checkbox"/> Fueling areas<sup>1</sup> shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.</p> <p><input type="checkbox"/> Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area<sup>1</sup>.] The canopy [or cover] shall not drain onto the fueling area.</p>		<p><input type="checkbox"/> The property owner shall dry sweep the fueling area routinely.</p> <p><input type="checkbox"/> See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a></p>
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<sup>1</sup> The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

<input type="checkbox"/> M. Loading Docks	<input type="checkbox"/> Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited.  Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.  Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.  <input type="checkbox"/>		<input type="checkbox"/> Move loaded and unloaded items indoors as soon as possible.  <input type="checkbox"/> See Fact Sheet SC-30, “Outdoor Loading and Unloading,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
<input type="checkbox"/> N. Fire Sprinkler Test Water		<input type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer.	<input type="checkbox"/> See the note in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>

<p>○. Miscellaneous Drain or Wash Water</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Boiler drain lines</li> <li><input type="checkbox"/> Condensate drain lines</li> <li><input type="checkbox"/> Rooftop equipment</li> <li><input type="checkbox"/> Drainage sumps</li> <li><input type="checkbox"/> Roofing, gutters, and trim.</li> </ul>		<ul style="list-style-type: none"> <li><input type="checkbox"/> Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.</li> <li><input type="checkbox"/> Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.</li> </ul> <p>Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment.</p> <p>Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.</li> <li><input type="checkbox"/></li> </ul>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> P. Plazas, sidewalks, and parking lots.</li> </ul>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.</li> </ul>

## STEP 7

### LID AND TREATMENT CONTROL SELECTION

A treatment control BMP and/or LID facility must be selected to treat the project pollutants of concern identified in Table 7 “Project Pollutants of Concern”. A treatment control facility with a high or medium pollutant removal efficiency for the project’s most significant pollutant of concern shall be selected. It is recommended to use the design procedure in Chapter 4 of the SUSMP to meet NPDES permit LID requirements, treatment requirements, and flow control requirements. If your project does not utilize this approach, the project will need to demonstrate compliance with LID, treatment and flow control requirements. Review Chapter 2 “Selection of Stormwater Treatment Facilities” in the SUSMP to assist in determining the appropriate treatment facility for your project.

Will this project be utilizing the unified LID design procedure as described in Chapter 4 of the Local SUSMP? <i>(If yes, please document in Attachment D following the steps in Chapter 4 of the County SUSMP)</i>	
Yes	No
If this project is not utilizing the unified LID design procedure, please describe how the alternative treatment facilities will comply with applicable LID criteria, stormwater treatment criteria, and hydromodification management criteria.	

- Indicate the project pollutants of concern (POCs) from Table 7 in Column 2 below.

TABLE 10: GROUPING OF POTENTIAL POLLUTANTS of Concern (POCs) by fate during stormwater treatment

Pollutant	Check Project Specific POCs	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment		X	X	
Nutrients			X	X
Heavy Metals			X	
Organic Compounds			X	
Trash & Debris		X		
Oxygen Demanding			X	
Bacteria			X	
Oil & Grease			X	
Pesticides			X	



- Indicate the treatment facility(s) chosen for this project in the following table.

TABLE 11: GROUPS OF POLLUTANTS and relative effectiveness of treatment facilities

Pollutants of Concern	Bioretention Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Constructed Wetlands	Infiltration Facilities or Practices (LID)	Media Filters	Higher-rate biofilters*	Higher-rate media filters*	Trash Racks & Hydro-dynamic Devices	Vegetated Swales
Coarse Sediment and Trash	High	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low	Medium
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low	Low

- Please check the box(s) that best describes the Treatment BMP(s) and/or LID BMP selected for this project.

TABLE 12: PROJECT LID AND TC-BMPS

<b>Bioretention Facilities (LID)</b>
<input type="checkbox"/> Bioretention area
<input type="checkbox"/> Flow-through Planter
<input type="checkbox"/> Cistern with Bioretention Facility
<b>Settling Basins (Dry Ponds)</b>
<input type="checkbox"/> Extended/dry detention basin with grass/vegetated lining
<input type="checkbox"/> Extended/dry detention basin with impervious lining
<b>Infiltration Facilities or Practices (LID)</b>
<input type="checkbox"/> Infiltration basin
<input type="checkbox"/> Dry well
<input type="checkbox"/> Infiltration trench
<b>Wet Ponds and Constructed Wetlands</b>
<input type="checkbox"/> Wet pond/basin (permanent pool)
<input type="checkbox"/> Constructed wetland
<b>Vegetated Swales (LID<sup>(1)</sup>)</b>
<input type="checkbox"/> Vegetated Swale

<b>Media Filters</b>
<input type="checkbox"/> Austin Sand Filter
<input type="checkbox"/> Delaware Sand Filter
<input type="checkbox"/> Multi-Chambered Treatment Train (MCTT)
<b>Higher-rate Biofilters</b>
<input type="checkbox"/> Tree-pit-style unit
<input type="checkbox"/> Other_____
<b>Higher-rate Media Filters</b>
<input type="checkbox"/> Vault-based filtration unit with replaceable cartridges
<input type="checkbox"/> Other_____
<b>Hydrodynamic Separator Systems</b>
<input type="checkbox"/> Swirl Concentrator
<input type="checkbox"/> Cyclone Separator
<b>Trash Racks</b>
<input type="checkbox"/> Catch Basin Insert
<input type="checkbox"/> Catch Basin Insert w/ Hydrocarbon boom
<input type="checkbox"/> Other_____
<b>Self-Treating or Self-Retaining Areas (LID)</b>
<input type="checkbox"/> Pervious Pavements
<input type="checkbox"/> Vegetated Roofs
<input type="checkbox"/> Other_____

<sup>(1)</sup> Must be designed per SUSMP “Vegetated Swales” design criteria for LID credit (p. 65).

For design guidelines and calculations refer to Chapter 4 “Low Impact Development Design Guide” in the SUSMP. Please show all calculations and design sheets for all treatment facilities proposed in Attachment D.

- Create a Construction Plan SWMP Checklist for your project.

Instructions on how to fill out table

1. Number and list each measure or BMP you have specified in your SWMP in Columns 1 and Maintenance Category in Column 3 of the table. Leave Column 2 blank.
2. When you submit construction plans, duplicate the table (by photocopy or electronically). Now fill in Column 2, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. This table must be shown on the front sheet of the grading and improvement plans.

Stormwater Treatment Control and LID BMP's			
Description / Type	Sheet	Maintenance Category	Revisions

\* BMP's approved as part of Stormwater Management Plan (SWMP) dated xx/xx/xx on file with DPW. Any changes to the above BMP's will require SWMP revision and Plan Change approvals.

- Please describe why the chosen treatment BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a feasibility analysis that demonstrates utilization of a treatment facility with a high or medium removal efficiency ranking is infeasible.

A Treatment BMP must address runoff from developed areas. Please provide the post-construction water quality treatment volume or flow values for the selected project Treatment BMP(s). Guidelines for design calculations are located in Chapter 4 of the County SUSMP. Label outfalls on the BMP map. The Water Quality peak rate of discharge flow ( $Q_{wQ}$ ) and the Water Quality storage volume ( $V_{wQ}$ ) is dependent on the type of treatment BMP selected for the project.

<b>Outfall</b>	<b>Tributary Area (acres)</b>	<b><math>Q_{wQ}</math> (cfs)</b>	<b><math>V_{wQ}</math> (ft<sup>3</sup>)</b>

## STEP 8

### OPERATION AND MAINTENANCE

- Please check the box that best describes the maintenance mechanism(s) for this project.

TABLE 13: PROJECT BMP CATEGORY

CATEGORY	SELECTED		BMP Description
	YES	NO	
First			
Second <sup>1</sup>			
Third <sup>2</sup>			
Fourth			

Note:

1. A recorded maintenance agreement will be required.
2. Project will be required to establish or be included in a Stormwater Maintenance Assessment District for the long-term maintenance of treatment BMPs.

- Please list all individual LID and Treatment Control BMPs (TC-BMPs) incorporated into project. Please ensure the “BMP Identifier” is consistent with the legend in Attachment C “LID and/or TC-BMP Exhibit”. Please attach the record plan sheets upon completion of project and amend the Major SWMP where appropriate. For each type of LID or TC-BMP provide an inspection sheet in Attachment F “Maintenance Plan”.

TABLE 14: PROJECT SPECIFIC LID AND TC-BMPs

BMP Identifier*	LID or TC-BMP Type	BMP Pollutant of Concern Efficiency (H,M,L) – Table 11	Final Construction Date (to be completed by County inspector)	Final Construction Inspector Name (to be completed by County inspector)

\* For location of BMP's, see approved Record Plan dated XX/XX/XX, plan (TYPE) sheet (#).

➤ Responsible Party for Long-term Maintenance:

Identify the parties responsible for long-term maintenance of the BMPs identified above and Source Controls specified in Attachment B. Include the appropriate written agreement with the entities responsible for O&M in Attachment F. Please see Chapter 5 “Private Ownership and Maintenance” on page 94 of the County SUSMP for appropriate maintenance mechanisms.

Name:
Company Name:
Phone Number:
Street Address:
City/State/Zip:
Email Address:

➤ Funding Source:

Provide the funding source or sources for long-term operation and maintenance of each BMP identified above. By certifying the Major SWMP the applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners.

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## ATTACHMENTS

Please include the following attachments.

ATTACHMENT		COMPLETED	N/A
A	Project Location Map		
B	Source Control Exhibit		
C	LID and/or TC-BMP Exhibit		
D	Drainage Management Area (DMA) Maps, Sizing Design Calculations and BMP/IMP Design Details		
E	Geotechnical Certification Sheet		
F	Maintenance Plan		
G	Tracking Report		
H	Addendum		

**Note:** Attachments B and C may be combined.

# **ATTACHMENT A**

## **Project Location Map**

# **ATTACHMENT B**

## **Source Control Exhibit**



# **ATTACHMENT C**

## **LID and/or TC-BMP Exhibit**

# **ATTACHMENT D**

## **Drainage Management Area (DMA) Maps, Sizing Design Calculations and TC-BMP/LID Design Details**

# ATTACHMENT E

## Geotechnical Certification Sheet

The design of stormwater treatment and other control measures proposed in this plan requiring specific soil infiltration characteristics and/or geological conditions has been reviewed and approved by a registered Civil Engineer, Geotechnical Engineer, or Geologist in the State of California.

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Name

---

Date

# ATTACHMENT F

## Maintenance Plan

(Use Chapter 5 of the SUSMP as guidance in developing your Maintenance Plan)

The following is a general outline for to create your project specific Maintenance Plan.

- I. Inspection, Maintenance Log and Self-Verification Forms (Examples are provided in Appendix F of the San Diego County SUSMP)
- II. Updates, Revisions and Errata
- III. Introduction
  - A. Narrative overview describing the site; drainage areas, routing, and discharge points; and treatment facilities.
- IV. Responsibility for Maintenance
  - A. General
    - (1) Name and contact information for responsible individual(s).
    - (2) Organization chart or charts showing organization of the maintenance function and location within the overall organization.
    - (3) Reference to Operation and Maintenance Agreement (if any). A copy of the agreement should be attached.
    - (4) Maintenance Funding
      - (1) Sources of funds for maintenance
      - (2) Budget category or line item
      - (3) Description of procedure and process for ensuring adequate funding for maintenance
  - B. Staff Training Program
  - C. Records
  - D. Safety
- V. Summary of Drainage Areas and Stormwater Facilities
  - A. Drainage Areas

- (1) Drawings showing pervious and impervious areas (copied or adapted from initial SWMP).
- (2) Designation and description of each drainage area and how flow is routed to the corresponding facility.

B. Treatment and Flow-Control Facilities

- (1) Drawings showing location and type of each facility
- (2) General description of each facility (Consider a table if more than two facilities)
  - (1) Area drained and routing of discharge.
  - (2) Facility type and size

VI. Facility Documentation

- A. “As-built” drawings of each facility (design drawings in the draft Plan)
- B. Manufacturer’s data, manuals, and maintenance requirements for pumps, mechanical or electrical equipment, and proprietary facilities (include a “placeholder” in the draft plan for information not yet available).
- C. Specific operation and maintenance concerns and troubleshooting

VII. Maintenance Schedule or Matrix

- A. Maintenance Schedule for each facility with specific requirements for:
  - (1) Routine inspection and maintenance
  - (2) Annual inspection and maintenance
  - (3) Inspection and maintenance after major storms

B. Service Agreement Information

Assemble and make copies of your maintenance plan. One copy must be submitted to the County, and at least one copy kept on-site. Here are some suggestions for formatting the maintenance plan:

- Format plans to 8½" x 11" to facilitate duplication, filing, and handling.
- Include the revision date in the footer on each page.
- Scan graphics and incorporate with text into a single electronic file. Keep the electronic file backed-up so that copies of the maintenance plan can be made if the hard copy is lost or damaged.

# **ATTACHMENT G**

## **Tracking Report**



COUNTY OF SAN DIEGO  
DEPARTMENT OF PUBLIC WORKS  
POST-CONSTRUCTION TRACKING AND  
INVENTORY REPORT

**General Project Information**

Permit Number \_\_\_\_\_ SWMP Category (Major/Minor) \_\_\_\_\_  
Location / Address \_\_\_\_\_  
Engineer of Work: \_\_\_\_\_ State Registration Number: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Email Address: \_\_\_\_\_  
Phone Number: \_\_\_\_\_

Priority Development Project – Step 1: \_\_\_\_\_

Percent Impervious Before Construction: % \_\_\_\_\_

Percent Impervious After Construction: % \_\_\_\_\_

Project Disturbed Area: \_\_\_\_\_ Acres

Hydromodification Management – Step 3:

Yes ☐ or No ☐

Primary or Secondary Pollutants of Concerns – Step 4 (*check all that apply*)

- |   |  |
|---|--|
| <input type="checkbox"/> Sediment             | <input type="checkbox"/> Trash and Debris            |
| <input type="checkbox"/> Nutrients            | <input type="checkbox"/> Oxygen Demanding Substances |
| <input type="checkbox"/> Organic Compounds    | <input type="checkbox"/> Oil and Grease              |
| <input type="checkbox"/> Bacteria and Viruses | <input type="checkbox"/> Pesticides                  |

**Project Specific Site Design, LID and Source Control BMPs**

*All selected Site Layout Strategies, LID, and Source Control BMPs must be shown on the Plan.*

Site Layout Strategies – Step 5 (*check all that apply*)

- |  |   |
|--|---|
| <input type="checkbox"/> Limitation of Development Envelope                    | <input type="checkbox"/> Preservation of Natural Drainages  |
| <input type="checkbox"/> Minimization of imperviousness                        | <input type="checkbox"/> Using drainage as a design element |
| <input type="checkbox"/> Setbacks from creeks, wetlands, and riparian habitats |   |

Disperse Runoff from Impervious Surfaces to Pervious – Step 5 (*check all that apply*)

- |  |  |
|--|--|
| <input type="checkbox"/> Street and Road Design              | <input type="checkbox"/> Parking Lot Design                |
| <input type="checkbox"/> Driveway, Sidewalk, Bikepath Design | <input type="checkbox"/> Building Design                   |
| <input type="checkbox"/> Landscape Design                    | <input type="checkbox"/> Direct Runoff to Treatment BMP(s) |

Source BMPs – Step 6 (*check all that apply*)

- |  |  |
|--|--|
| <input type="checkbox"/> Stormdrain Signage and Stenciling | <input type="checkbox"/> Outdoor Storage Areas                 |
| <input type="checkbox"/> Trash Storage Areas               | <input type="checkbox"/> Efficient Landscape Irrigation Design |
| <input type="checkbox"/> Private Road Drainage System      | <input type="checkbox"/> Residential Driveways & Guest Parking |
| <input type="checkbox"/> Dock Areas                        | <input type="checkbox"/> Maintenance Bays                      |
| <input type="checkbox"/> Vehicle Wash Areas                | <input type="checkbox"/> Outdoor Processing Areas              |
| <input type="checkbox"/> Equipment Wash Areas              | <input type="checkbox"/> Parking Areas                         |
| <input type="checkbox"/> Fueling Areas                     |  |

**Post-construction Treatment Control BMP Information**

Responsible Party for Maintenance – Step 8:

Name \_\_\_\_\_ Phone Number (\_\_\_\_) \_\_\_\_\_  
Street Number \_\_\_\_\_ Street Name \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Email Address: \_\_\_\_\_

Project Maintenance Category (1, 2, 3 or 4): \_\_\_\_

Project Specific Treatment Control BMPs

BMP Identifier*	BMP Type	BMP Pollutant of Concern Efficiency (H,M,L) – Table 11	Final Construction Date (to be completed by County inspector)	Final Construction Inspector Name (to be completed by County inspector)

\* For location of BMP's, see approved Record Plan dated \_\_\_\_\_, plan sheet \_\_\_\_.



<b><u>Record Plan Certification</u></b>
---

I certify that the above items for this project are in substantial conformance with the approved plans.      Yes ☐      or      No ☐

Please sign your name and seal.

[SEAL]

Print Name: \_\_\_\_\_

Sign Name: \_\_\_\_\_

# **ATTACHMENT H**

## **Addendum**

**APPENDIX D**

**MINOR SWMP FORM**



County of San Diego

## MINOR STORMWATER MANAGEMENT PLAN

This Minor Stormwater Management Plan (Minor SWMP) must be completed in its entirety and accompany applications to the County for a permit or approval associated with certain types of development projects. To determine whether your project is required to submit a Minor or Major SWMP please reference the County's Stormwater Intake Form for Development Projects. Minor SWMPs are typically required for building and minor grading permit applications and certain discretionary permit applications (See note #1 on page 7).

### STEP 1: IDENTIFY RELEVANT PROJECT INFORMATION

Permit Application Number:		APN#:	
Project Description:		Project address or location:	
		Project Contact & Phone #:	
	Square Foot of Improvements:	Estimated project start date:	Estimated project finish date:

Estimated amount of disturbed acreage: \_\_\_\_\_ (Acres or ft<sup>2</sup>)  
(If >1 acre, you must also provide a WDID number from the SWRCB) WDID: \_\_\_\_\_

Complete A through C and the calculations below to determine the amount of impervious surface on your project before and after construction.

- A. Total Lot Size: \_\_\_\_\_ (Acres or ft<sup>2</sup>)
- B. Total impervious area (including roof tops) before construction \_\_\_\_\_ (Acres or ft<sup>2</sup>)
- C. Total impervious area (including roof tops) after construction \_\_\_\_\_ (Acres or ft<sup>2</sup>)

Calculate percent impervious before construction:  $B \div A \times 100\% =$   %

Calculate percent impervious after construction:  $C \div A \times 100\% =$   %

### STEP 2: IDENTIFY CONSTRUCTION STORMWATER BMPs

Unprotected construction sites have the potential to discharge sediment and other pollutants into local waterways. All construction projects are required to reduce pollution to the maximum extent practicable by implementing best management practices (BMPs). Sections 67.806 (General Best Management Practice Requirements) and 67.811 (Additional Requirements for Land Disturbance Activities) of the County of San Diego Watershed Protection, Stormwater Management and Discharge Control Ordinance (WPO) outline the requirements for Construction Stormwater BMPs. There are five categories:

1. Erosion control practices
2. Velocity reduction
3. Sediment control practices
4. Offsite sediment tracking control
5. General site and materials management

BMPs from each of the five categories must be used together as a system in order to prevent potential discharges.

If you answer "Yes" to any of the questions below, your project is subject to Table I on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in the table, please select at least the minimum number of required BMPs, or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project.

1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.)<sup>(1)</sup> ..... Yes No  
**Reference Table I items A, B, D and E**
2. Will there be asphalt paving, including patching? ..... Yes No  
**Reference Table I items D and F**
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? ..... Yes No  
**Reference Table I items D and F**
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? ..... Yes No  
**Reference Table I items D and F**
5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? ..... Yes No  
**Reference Table I items D and F**
6. Will there be dewatering operations? ..... Yes No  
**Reference Table I items C and D**
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? ..... Yes No  
**Reference Table I items E and F**
8. Will trash or solid waste product be generated from this project? ..... Yes No  
**Reference Table I item F**
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) ..... Yes No  
**Reference Table I item F**
10. Will Portable Sanitary Services ("Porta-potty") be used on the site? ..... Yes No  
**Reference Table I item F**

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(1) Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement

**TABLE I. MINIMUM REQUIRED STANDARD CONSTRUCTION STORMWATER BMPs <sup>(1) (2)</sup>**

Minimum Required Best Management Practices (BMPs)	CALTRANS Stormwater Handbook Detail	✓ BMP Selected	<i>Each selected BMP must be shown on the Plan. If No BMP is selected, an explanation must be provided.</i>
<b>A. Select Erosion Control method for Disturbed Slopes (Choose at least one for the appropriate season)</b>			
Vegetation Stabilization Planting <sup>(3)</sup> (Summer)	SS-2, SS-4		
Hydraulic Stabilization Hydroseeding <sup>(3)</sup> (Summer)	SS-4		
Bonded Fiber Matrix or Stabilized Fiber Matrix <sup>(4)</sup> (Winter)	SS-3		
Physical Stabilization Erosion Control Blanket <sup>(4)</sup> (Winter)	SS-7		
<b>B. Select Erosion Control method for Disturbed Flat Areas (slope &lt; 5%) (Choose at least one)</b>			
County Standard Lot Perimeter Protection Detail	DPLU 659, SC-2		
Will use erosion control measures from Item A on flat areas also	SS-3,4,7		
County Standard Desilting Basin (must treat all site runoff)	DPLU 660, SC-2		
Mulch, straw, wood chips, soil application	SS-6, SS-8		
<b>C. If Runoff or Dewatering Operation is concentrated, velocity must be controlled using an energy dissipater</b>			
Energy Dissipater Outlet Protection <sup>(5)</sup>	SS-10		
<b>D. Select Sediment Control method for all disturbed areas (Choose at least one)</b>			
Silt Fence	SC-1		
Fiber Rolls (Straw Wattles)	SC-5		
Gravel Bags	SC-6 & 8		
Dewatering Filtration	NS-2		
Storm Drain Inlet Protection	SC-10		
Engineered Desilting Basin (sized for 10-year flow)	SC-2		
<b>E. Select method for preventing offsite tracking of sediment (Choose at least one)</b>			
Stabilized Construction Entrance	TC-1		
Construction Road Stabilization	TC-2		
Entrance/Exit Tire Wash	TC-3		
Entrance/Exit Inspection & Cleaning Facility	-		
Street Sweeping and Vacuuming	SC-7		
<b>F. Select the General Site Management BMPs for each waste that will be on site<sup>(5)</sup></b>			
<b>Materials Management</b>			
Material Delivery & Storage	WM-1		
Spill Prevention and Control	WM-4		
<b>Waste Management</b>			
Concrete Waste Management	WM-8		
Solid Waste Management	WM-5		
Sanitary Waste Management	WM-9		
Hazardous Waste Management	WM-6		

### STEP 3: IDENTIFY LOW IMPACT DEVELOPMENT BMPs

WPO Section 67.806(c)(2) requires all development projects, regardless of priority, to implement Low Impact Development (LID) BMPs. The goal of the County of San Diego's LID program is to protect water quality by preserving and mimicking nature through the use of stormwater planning and management techniques such as small-scale detention and retention on development sites. Table II contains LID planning and management practices which are outlined in detail in the County of San Diego Low Impact Development Handbook. You are required to select a minimum of two LID Planning Practices and at least one LID Management Practice to reduce runoff from your site, and are encouraged to select additional BMPs as applicable. Additional information and details are available at <http://www.sdcountry.ca.gov/dplu/docs/LID-Handbook.pdf> and <http://www.sdcountry.ca.gov/dplu/docs/LID-Appendices.pdf>.

**TABLE II. MINIMUM REQUIRED LOW IMPACT DEVELOPMENT BMPs**

Minimum Required Low Impact Development (BMPs)	County LID Handbook Detail	✓ BMP Selected	<i>Each selected BMP must be shown on the Plan. If No BMP is selected, an explanation must be provided.</i>
<b>LID Planning Practices (Reference Section 2.2 of the County LID Handbook) (Choose at least two)</b>			
Conservation of Natural Drainages, Well Drained Soils and Significant Vegetation (e.g., minimize disturbance of natural areas; construct in least environmentally sensitive areas of the site)	2.2.1		
Minimize Disturbances to Natural Drainages (e.g., avoid disturbing natural swales & topographic depressions; construction setback from creek)	2.2.2		
Minimize Impervious Surfaces (e.g., preserve existing vegetation; permeable pavement for walkways, excess parking/driveway areas, exterior exposed slabs, etc.)	2.2.3		
Disconnect Impervious Surfaces (e.g., disconnect continuously paved areas with landscaping; direct roof runoff to permeable areas)	2.2.3		
Minimize Soil Compaction (e.g., protect native soil & vegetation from construction equipment; avoid compaction in planned landscaping areas)	2.2.4		
Drain Runoff from Impervious Surfaces to Pervious Areas (e.g., direct runoff from rooftops, patio slabs, walkways, parking lots, etc. to landscaped areas)	2.2.5		
<b>LID Management Practices (Reference Section 3 of the County LID Handbook) (Choose at least one)</b>			
Hydrologic Design (e.g., infiltration trench or basin; depression area in a lawn for infiltration; bio-filters such as vegetated or rock swales)	3.1		
Permeable Pavement Design (e.g., pervious concrete; permeable asphalt concrete/pavers; granular materials)	3.2		
LID Road Design for Developments (e.g., reduce overall road coverage; direct surface flow to vegetated swales)	3.3		
LID Parking Lot Design for Commercial Projects (e.g., use permeable materials for overflow parking; perimeter landscaping)	3.4		
LID Driveway, Sidewalk and Bike Path Design (e.g., single lane driveway flared at multi-car garage; slope driveways 2% to adjacent vegetated area)	3.5		
LID Building Design (e.g., dry-well; roof downspout to landscaped area or swale; cisterns and rain barrels)	3.6		
LID Landscaping Design (e.g., concave area of lawn; save and reuse native topsoil for landscaped areas; protect areas of native vegetation; street trees adjacent to sidewalks and driveways)	3.7		

#### STEP 4: IDENTIFY POST-CONSTRUCTION (PERMANENT) BMPs

WPO Section 67.806 (c)(1) requires development projects with the potential to add pollutants to stormwater or to affect the flow rate or velocity of stormwater runoff after construction is completed to employ post-construction (permanent) BMPs, as feasible, to ensure that pollutants and runoff from the development are reduced to the maximum extent practicable. Using Table III below, select the post-construction BMPs that will be implemented on your project.

**TABLE III. POST-CONSTRUCTION (PERMANENT) BMPs**

Best Management Practices (BMPs)	CASQA Stormwater Handbook	✓ BMP Selected	<i>Each selected BMP must be shown on the Plan.</i> If No BMP is selected, an explanation must be provided.
<b>Source Control BMPs (Select all that apply)</b>			
Implementation of Efficient Irrigation Systems	SD-12		
Storm Drain Stenciling and Posting of Signage	SD-13		
Proper Design of Trash Storage Areas	SD-32		
Proper Design of Outdoor Material Storage Areas	SD-34		
<b>Buffer Zones</b>			
Design project to include a buffer zone for natural water bodies. Where buffer zones are not feasible, other equally serving methods may be implemented such as trees or access restrictions.	N/A		
<b>Additional Permanent Stormwater BMPs</b>			
Protection of Channel Banks/Manufactured Slopes	SD-10		
Outlet Protection (Velocity Dissipation Devices)	EC-10		
Flat Pad Area Coverage (Permanent Landscaping / Groundcover)	SD-10		
Underground Infiltration Trench	TC-10		

#### STEP 5: CERTIFICATION

***The applicant must sign the following certification before a permit will be issued.***

I have read and understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including stormwater, from construction and land development activities. I certify that the BMPs selected on this form will be implemented to minimize the potentially negative impacts of this project's construction and land development activities on water quality. I further agree to install, monitor, maintain, or revise the selected BMPs to ensure their effectiveness. I also understand that non-compliance with the County's WPO and Grading Ordinance may result in enforcement by the County, including fines, cease and desist orders, or other actions.

Applicant: \_\_\_\_\_

Date: \_\_\_\_\_



## Notes

1. Discretionary Permits that may be eligible to use this form include Tentative Parcel Maps, Construction Right of Way Permits, Encroachment Permits or Minor Use Permits. Please be aware that if it is determined during the review process that the permit has the potential to significantly impact water quality after construction, a Major Stormwater Management Plan shall be required.
2. In accordance with the Municipal Stormwater Permit that is issued by the Regional Water Quality Control Board, each construction site with construction stormwater BMP requirements must be designated with a "priority" to determine inspection frequency. The criteria used to determine the stormwater inspection frequency is outlined below. Please note that the County reserves the right to adjust the priority of the projects both before and during construction. Further, the construction priority only establishes the required inspection frequency and does NOT change construction BMP requirements that apply to projects.
  - High Priority – Bi-Weekly inspections during the rainy season (October 1<sup>st</sup> through April 30<sup>th</sup>)
    - a) The project is a single family dwelling located in a new residential subdivision (1014 permit); or,
    - b) The project disturbs one acre or more of soil; AND
      - Is located within a watershed that is listed as 303(d) impaired for sediment (904.21, 904.31, 904.61) or,
      - Is located within 200 feet of lands designated with the RARE beneficial use; or,
      - Is located within 200 feet of lands designated as Areas of Significant Biological Concern (ASBC); or,
      - Is located within 200 feet of lands designated Multiple Species Conservation Program (MSCP)
  - Medium Priority – Monthly inspections during the rainy season (October 1<sup>st</sup> through April 30<sup>th</sup>)
    - a) The project is a DPLU Minor grading permit; or
    - b) The project disturbs an area greater than one acre;
  - Low Priority – At least two inspections during the rainy season (October 1<sup>st</sup> through April 30<sup>th</sup>)
    - a) The project will disturb soil, and none of the above criteria apply
- Stormwater inspections during the dry season are conducted as part of the regular inspection process (e.g. foundation, frame, lath/drywall, etc.).
3. If Vegetation Stabilization (Planting or Hydroseeding) is proposed for erosion control it may be installed between May 1<sup>st</sup> and August 15<sup>th</sup> Slope irrigation is in place and to be operable for slopes >3'. Vegetation must be watered and established prior to October 1<sup>st</sup>. The owner shall implement a contingency physical BMP by August 15<sup>th</sup> if vegetation establishment does not occur by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation shall have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.
4. All slopes over three feet must have established vegetative cover prior to final permit approval.
5. Regional Standard Drawing D-40 - Rip Rap Energy Dissipater is also acceptable for velocity reduction.
6. Not all projects will have every waste identified. The applicant is responsible for identifying wastes that will- be on-site and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 must be selected.

## **APPENDIX E**

### **POLLUTANT SOURCES AND SOURCE CONTROL CHECKLIST**

## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions on pages \_\_\_\_ of the *Countywide Model SUSMP*):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Project-Specific SUSMP drawings.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your Project-Specific SUSMP. Use the format shown in Table 3-1 on page \_\_\_\_ of the *Countywide Model SUSMP*. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on SUSMP Drawings	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> A. On-site storm drain inlets	<input type="checkbox"/> Locations of inlets.	<input type="checkbox"/> Mark all inlets with the words “No Dumping! Flows to Bay” or similar.	<input type="checkbox"/> Maintain and periodically repaint or replace inlet markings. <input type="checkbox"/> Provide stormwater pollution prevention information to new site owners, lessees, or operators. <input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-44, “Drainage System Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> <input type="checkbox"/> Include the following in lease agreements: “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains.”
<input type="checkbox"/> B. Interior floor drains and elevator shaft sump pumps		<input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	<input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.

# APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on SUSMP Drawings	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> C. Interior parking garages		<input type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.	<input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.
<input type="checkbox"/> D1. Need for future indoor & structural pest control		<input type="checkbox"/> Note building design features that discourage entry of pests.	<input type="checkbox"/> Provide Integrated Pest Management information to owners, lessees, and operators.
<input type="checkbox"/> D2. Landscape/ Outdoor Pesticide Use	<input type="checkbox"/> Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. <input type="checkbox"/> Show self-retaining landscape areas, if any. <input type="checkbox"/> Show stormwater treatment facilities.	State that final landscape plans will accomplish all of the following. <input type="checkbox"/> Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. <input type="checkbox"/> Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. <input type="checkbox"/> Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. <input type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape. <input type="checkbox"/> To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	<input type="checkbox"/> Maintain landscaping using minimum or no pesticides. <input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> <input type="checkbox"/> Provide IPM information to new owners, lessees and operators.

## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on SUSMP Drawings	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> E. Pools, spas, ponds, decorative fountains, and other water features.	<input type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	<input type="checkbox"/> If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	<input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-72, “Fountain and Pool Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
<input type="checkbox"/> F. Food service	<input type="checkbox"/> For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.  <input type="checkbox"/> On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	<input type="checkbox"/> Describe the location and features of the designated cleaning area.  <input type="checkbox"/> Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	<input type="checkbox"/>

# APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on SUSMP Drawings	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> G. Refuse areas	<input type="checkbox"/> Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.  <input type="checkbox"/> If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.  <input type="checkbox"/> Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	<input type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans.  <input type="checkbox"/> State that signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.	<input type="checkbox"/> State how the following will be implemented:  Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post “no hazardous materials” signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, “Waste Handling and Disposal” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
<input type="checkbox"/> H. Industrial processes.	<input type="checkbox"/> Show process area.	<input type="checkbox"/> If industrial processes are to be located on site, state: “All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.”	<input type="checkbox"/> See Fact Sheet SC-10, “Non-Stormwater Discharges” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>

## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on SUSMP Drawings	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
<input type="checkbox"/> I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	<input type="checkbox"/> Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.  <input type="checkbox"/> Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.  <input type="checkbox"/> Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	<input type="checkbox"/> Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: <ul style="list-style-type: none"> <li>▪ Hazardous Waste Generation</li> <li>▪ Hazardous Materials Release Response and Inventory</li> <li>▪ California Accidental Release (CalARP)</li> <li>▪ Aboveground Storage Tank</li> <li>▪ Uniform Fire Code Article 80 Section 103(b) &amp; (c) 1991</li> <li>▪ Underground Storage Tank</li> </ul>	<input type="checkbox"/> See the Fact Sheets SC-31, “Outdoor Liquid Container Storage” and SC-33, “Outdoor Storage of Raw Materials” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>

## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p><input type="checkbox"/> J. Vehicle and Equipment Cleaning</p>	<p><input type="checkbox"/> Show on drawings as appropriate:</p> <p>(1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.</p> <p>(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).</p> <p>(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.</p> <p>(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.</p>	<p><input type="checkbox"/> If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.</p>	<p>Describe operational measures to implement the following (if applicable):</p> <p><input type="checkbox"/> Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.</p> <p><input type="checkbox"/> Car dealerships and similar may rinse cars with water only.</p> <p><input type="checkbox"/> See Fact Sheet SC-21, “Vehicle and Equipment Cleaning,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a></p>
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## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<input type="checkbox"/> <b>K. Vehicle/Equipment Repair and Maintenance</b>	<input type="checkbox"/> Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.  <input type="checkbox"/> Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.  <input type="checkbox"/> Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	<input type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.  <input type="checkbox"/> State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.  <input type="checkbox"/> State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	<p>In the SUSMP report, note that all of the following restrictions apply to use the site:</p> <input type="checkbox"/> No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.  No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.  <input type="checkbox"/> No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.
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## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<input type="checkbox"/> L. Fuel Dispensing Areas	<input type="checkbox"/> Fueling areas <sup>1</sup> shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.  <input type="checkbox"/> Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area <sup>1</sup> .] The canopy [or cover] shall not drain onto the fueling area.		<input type="checkbox"/> The property owner shall dry sweep the fueling area routinely.  <input type="checkbox"/> See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
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<sup>1</sup> The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<input type="checkbox"/> M. Loading Docks	<input type="checkbox"/> Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited.  <input type="checkbox"/> Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.  <input type="checkbox"/> Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		<input type="checkbox"/> Move loaded and unloaded items indoors as soon as possible.  <input type="checkbox"/> See Fact Sheet SC-30, “Outdoor Loading and Unloading,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>
<input type="checkbox"/> N. Fire Sprinkler Test Water		<input type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer.	<input type="checkbox"/> See the note in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>

## APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p>O. Miscellaneous Drain or Wash Water</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Boiler drain lines</li> <li><input type="checkbox"/> Condensate drain lines</li> <li><input type="checkbox"/> Rooftop equipment</li> <li><input type="checkbox"/> Drainage sumps</li> <li><input type="checkbox"/> Roofing, gutters, and trim.</li> </ul>		<ul style="list-style-type: none"> <li><input type="checkbox"/> Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.</li> <li><input type="checkbox"/> Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.</li> <li>Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment.</li> <li><input type="checkbox"/> Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.</li> <li><input type="checkbox"/> Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.</li> </ul>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> P. Plazas, sidewalks, and parking lots.</li> </ul>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.</li> </ul>

**APPENDIX F**

**SELF VERIFICATION FORMS**

## PRIVATELY OWNED STORMWATER TREATMENT CONTROL BEST MANAGEMENT PRACTICES: OPERATION AND MAINTENANCE VERIFICATION

On January 24, 2007, the California Regional Water Quality Control Board, San Diego Region, re-issued the Municipal Storm Water Permit to the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority. As a requirement of the Municipal Storm Water Permit, the County of San Diego must obtain annual verification of effective operation and maintenance of each approved Treatment Control Best Management Practice (BMP) located on properties within the County of San Diego jurisdiction. This compliance action will be done through (1) the self-verification documentation described below and (2) inspections conducted by the County.

The annual verification of effective operation and maintenance is a requirement that must be provided by the party responsible for the treatment control BMP maintenance. The County of San Diego is implementing this requirement through Section 67.813 of the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (the "WPO"). The attached Private Treatment Control BMP Operation and Maintenance Verification Forms may be used for this purpose. These forms will need to be submitted to the County each year--no later than July 1-- for each treatment control BMP on your site.

The County of San Diego will also be conducting scheduled and unscheduled inspections of privately owned Treatment Control BMPs to verify whether they have been maintained and are operating effectively.

Provided below are Self-Verification Operation and Maintenance Form templates which can be tailored to your project specific Treatment Control BMPs and Low Impact Development (LID) Facilities:

- BIOFILTERS
- DETENTION BASINS AND WET PONDS
- DRAINAGE INSERTS
- FILTRATION
- HYDRODYNAMIC DEVICES
- INFILTRATION FACILITIES
- PLANTER BOXES

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
BIOFILTER**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party      Print Name      Date

# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM BIOFILTER

Biofilters Include:

☐ **Vegetated Filter Strip**

☐ **Vegetated Swale**

☐ **Bioretention Facility**

Routine maintenance is needed to ensure that flow is unobstructed, that erosion is prevented, and that soils are held together by plant roots and are biologically active. Typical maintenance consists of the following:

<b>Bioretention BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Examine the vegetation to ensure that it is healthy and dense enough to provide filtering and to protect soils from erosion. Replenish mulch as necessary, remove fallen leaves and debris, prune large shrubs or trees, and mow turf areas.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation (typically 4-6 inches for grass). Confirm that irrigation is adequate and not excessive and that sprays do not directly enter overflow grates. Replace dead plants and remove noxious and invasive vegetation.
Erosion due to concentrated irrigation flow	Repair/re-seed eroded areas and adjust the irrigation system.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or re-grading where necessary.
Standing water (BMP not draining)	Abate any potential vectors by filling holes in the ground in and around the biofilter facility and by insuring that there are no areas where water stands longer than 48 hours following a storm. If mosquito larvae are present and persistent, contact the San Diego County Vector Control Program at (858) 694-2888. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet, or outlet structures	Repair or replace as applicable.



# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM DETENTION BASINS AND WET PONDS

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

Number                      Street Name & Suffix                      City/Zip

☐ Check here for Address Change

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to: County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

**Signature of Responsible Party**                      **Print Name**                      **Date**

# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM DETENTION – SIDE 2

These larger-scale facilities remove pollutants by detaining runoff in a quiescent pool long enough for some of the particulates to settle to the bottom. The following list of typical maintenance indicators and maintenance activities for detention basins and wet ponds is provided for your reference.

<b>Detention BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Poor vegetation establishment	Re-seed, re-establish vegetation.
Overgrown vegetation and invasive plants	Mow or trim as appropriate and remove invasive plants.
Erosion due to concentrated irrigation flow	Repair/re-seed eroded areas and adjust the irrigation system.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or re-grading where necessary.
Gopher holes	Repair/re-seed holes and make appropriate corrective measures to prevent rodent activity.
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation. Dredge accumulated sediment. This may be required every five to 15 years, and more frequently if there are excess sources of sediment (as may occur on newly constructed sites where soils are not yet stabilized). Dredging is usually a major project requiring mechanized equipment. The work will include an initial survey of depths and elevations; sediment sampling and testing; removal, transport, and disposal of accumulated sediment, and reestablishment of original design grades and sections.
Standing water (BMP not draining)	Abate any potential vectors by filling holes in the ground in and around the pond and by insuring that there are no areas where water stands longer than 48 hours following a storm. If mosquito larvae are present and persistent, contact the San Diego County Vector Control Program at (858) 694-2888. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet, or outlet structures	Remove any debris or sediment that could plug the outlets. Identify and correct any sources of sediment and debris. Check rocks or other armoring and replace as necessary.

# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM DRAINAGE INSERTS

1. Transcribe the following information from your notification letter and make corrections as necessary:

Permit No.: \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       )                      ☐ *Check here for Phone Number Change*

**Responsible Party Address:**

☐ *Check here for Address Change*

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. *Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).*

4. Sign the bottom of the form and return to: County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

**Signature of Responsible Party**

Print Name \_\_\_\_\_

Date \_\_\_\_\_

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
DRAINAGE INSERTS – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for drainage inserts is provided for your reference.

<b>Drainage Insert BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Spent or clogged sorbent material or media pack	Remove and properly dispose of sorbent material or media pack, and replace with fresh material. These materials/media are potentially hazardous and must be handled by a properly trained contractor.
Damage to components of the drainage insert	Repair or replace as applicable.

Maintenance of drainage inserts involves handling of potentially hazardous material (oil sorbent material), which requires special disposal. Additionally, maintenance may involve entry into the storm drain inlet underground. Therefore the maintenance operator must be trained in handling and disposal of hazardous waste, and must also be certified for confined space entry if the maintenance will require entry into the storm drain inlet. Therefore it is recommended that private BMP owners obtain a maintenance contract with a qualified contractor to provide inspection and maintenance. There are several storm drain cleaning service providers who are able to inspect and/or maintain drainage inserts. Contact the manufacturer of the drainage insert to find qualified service providers.

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
FILTRATION DEVICES**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party      Print Name      Date

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
FILTRATION – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for filtration BMPs is provided for your reference.

<b>Filtration BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Accumulation of floating oil and grease	Remove and properly dispose of oil and grease.
Clogged filter media	Remove and properly dispose of filter media, and replace with fresh media.
Damage to components of the filtration system	Repair or replace as applicable.

Maintenance of filtration BMPs involves handling of potentially hazardous material (oil and/or oil sorbent material), which requires special disposal. Additionally, maintenance may involve entry into the filtration BMP underground. Therefore the maintenance operator must be trained in handling and disposal of hazardous waste, and must also be certified for confined space entry if the maintenance will require entry into the filtration BMP. Therefore it is recommended that private BMP owners obtain a maintenance contract with a qualified contractor to provide inspection and maintenance. There are several storm drain cleaning service providers who are able to inspect and/or maintain filtration BMPs. Contact the manufacturer of the filtration system to find qualified service providers.

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
HYDRODYNAMIC SEPARATORS**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party      Print Name      Date

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
HYDRODYNAMIC SEPARATORS – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for hydrodynamic separators is provided for your reference.

<b>Hydrodynamic Separator BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Accumulation of floating oil and grease	Remove and properly dispose of oil and grease.
Spent or clogged sorbent material or media pack	Remove and properly dispose of sorbent material or media pack, and replace with fresh material. These materials/media are potentially hazardous and must be handled by a properly trained contractor.
Damage to components of the hydrodynamic separator	Repair or replace as applicable.

Maintenance of hydrodynamic separators involves handling of potentially hazardous material (oil and/or oil sorbent material), which requires special disposal. Additionally, maintenance may involve entry into the hydrodynamic separator underground. Therefore the maintenance operator must be trained in handling and disposal of hazardous waste, and must also be certified for confined space entry if the maintenance will require entry into the hydrodynamic separator. Therefore it is recommended that private BMP owners obtain a maintenance contract with a qualified contractor to provide inspection and maintenance. There are several storm drain cleaning service providers who are able to inspect and/or maintain hydrodynamic separators. Contact the manufacturer of the hydrodynamic separator to find qualified service providers.



**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
INFILTRATION SYSTEM**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party

Print Name

Date

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
INFILTRATION – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for infiltration BMPs is provided for your reference. There are many types of infiltration BMPs including basins that store storm water runoff in above-ground ponding areas until it infiltrates into the surrounding soils, and gravel-filled trenches or wells that store storm water runoff in the gravel reservoir until it infiltrates into the surrounding soils. This BMP category also includes permeable paving areas that store storm water runoff in a gravel reservoir under the permeable paving surface.

<b>Infiltration BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris in infiltration basin, pre-treatment device, or on surface of porous pavement, as applicable	Remove and properly dispose of accumulated materials.
Standing water in infiltration basin	Remove and replace clogged surface soils.
Standing water in infiltration trench, dry well, or subsurface reservoir bed	Flush fine sediment from gravel storage area.
Standing water in permeable paving area	Flush fine sediment from paving and subsurface gravel.
Damage to permeable paving surface resulting in reduced storm water intake capacity	Repair or replace damaged surface as appropriate.

When inspection or maintenance indicates sediment is accumulating in an infiltration BMP, the watershed draining to the infiltration BMP should be examined to determine the source of the sediment, and corrective measures should be made as applicable to minimize the sediment supply.

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
PLANTER BOXES**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party      Print Name      Date

# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM PLANTER BOXES

Planter boxes capture runoff from downspouts or sheet flow from plazas and paved areas. The runoff briefly floods the surface of the box and then percolates through an active soil layer to drain rock below. Typical maintenance consists of the following:

Planter Box BMP Inspection and Maintenance Checklist	
Typical Maintenance Indicators	Typical Maintenance Actions
Accumulation of sediment, litter, or debris	Check that the soil is at the appropriate depth to allow a reservoir above the soil surface and is sufficient to effectively filter stormwater. Remove any accumulations of sediment, litter, and debris. Till or replace soil as necessary. Confirm that soil is not clogging and that the planter will drain within 3-4 hours after a storm event.
Poor vegetation establishment	Determine whether the vegetation is dense and healthy. Replace dead plants. Prune or remove any overgrown plants or shrubs that may interfere with planter operation. Clean up fallen leaves or debris and replenish mulch. Remove any nuisance or invasive vegetation.
Standing water (BMP not draining)	Check the underdrain piping to make sure it is intact and unobstructed. If mosquito larvae are present and persistent, contact the San Diego County Vector Control Program at (858) 694-2888. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.
Erosion due to concentrated stormwater runoff flow	Examine downspouts from rooftops or sheet flow from paving to ensure that flow to the planter is unimpeded. Remove any debris and repair any damaged pipes. Check splash blocks or rocks and repair, replace, or replenish as necessary.
Damage to structural components such as the box, inlet, or outlet structures	Observe the structure of the box and fix any holes, cracks, rotting, or failure.
Obstructed inlet or outlet structure	Clear obstructions. Examine the overflow pipe to make sure that it can safely convey excess flows to a storm drain. Repair or replace any damaged or disconnected piping.

**Attachment 4.2 – CEQA Initial Study-Environmental  
Checklist Form for Hydrology and Water Quality**  
Updated June 3, 2008

ATTACHMENT 4.2  
CEQA – INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

***Excerpt from DPLU's CEQA Review for Discretionary Projects***  
**CEQA Initial Study - Environmental Checklist Form**  
**(Based on the State CEQA Guidelines, Appendix G Rev. 10/04)**

**VIII. HYDROLOGY AND WATER QUALITY** -- Would the project:

**a) Violate any waste discharge requirements?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**b) Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, could the project result in an increase in any pollutant for which the water body is already impaired?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**c) Could the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

ATTACHMENT 4.2  
CEQA – INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

- d) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

- e) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

- f) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

- g) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems?**

ATTACHMENT 4.2  
CEQA – INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**h) Provide substantial additional sources of polluted runoff?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**i) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, including County Floodplain Maps?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**j) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**k) Expose people or structures to a significant risk of loss, injury or death involving flooding?**



ATTACHMENT 4.2  
CEQA – INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**l) Expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a levee or dam?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**m) Inundation by seiche, tsunami, or mudflow?**

- |   |   |
|---|---|
| <input type="checkbox"/> Potentially Significant Impact                     | <input type="checkbox"/> Less than Significant Impact |
| <input type="checkbox"/> Less Than Significant With Mitigation Incorporated | <input type="checkbox"/> No Impact                    |

Discussion/Explanation:

**Attachment 4.3 – Treatment Control BMP Inventory**  
Updated June 3, 2008

### Attachment 4.3 - Treatment Control BMPs

ADDRESS			CITY/ZIP	APN	HSU	CATEGORY (1,2, 3. OR	BMPS IMPLEMENTED	RESPONSIBLE PARTY FOR MAINTENANCE
NUMBER	STREET NAME	SUFFIX						
5749	CAMINO DEL CIELO		FALLBROOK 92028	127-380-04-00	903.12	2	FOSSIL FILTER INSERT	MICHAEL J. HALL, PRESIDENT AND SECRETARY; HALL INVESTMENT CO., INC.
	JAMACHA	ROAD		502-040-58-00	909.21	2	STORM DRAIN INLET FILT	MICHAEL J. FLYNN, PRESIDENT; BRUCE M. KAUDERER, VICE PRESIDENT; K&S EL CAJON 1028, INC., A DELAWARE CORPORATION
16199	RANCHO VALENCIA	DRIVE		303-090-47-00	905.11	2	CLEARWATER BMPS	RVR PARTNERS LTD.
25067	JACK RABBIT ACRES			224-290-13-00	904.62	2	DETENTION BASIN & CURB INLET FILTER	RUSS EARNSHAW, VICE PRESIDENT; COUNTRY GROVE DEVELOPMENT CO, L.L.C
9655	PINO	DRIVE	LAKESIDE 92040		907.12	4	DETENTION BASIN	FLOOD CONTROL
4610	RANCHO REPOSO		DEL MAR 92014	302-210-58-00	905.11	4	DETENTION BASIN	FLOOD CONTROL
11967	WOODSIDE	AVENUE	LAKESIDE 92040	382-071-06-00	907.12	4	DETENTION BASIN (WQ)	FLOOD CONTROL
1545	OLIVEWOOD	LANE	ALPINE 91901	403-360-53-00	907.33	4	DETENTION BASIN	FLOOD CONTROL
509	CATARINA	DRIVE	BORREGO SPRINGS 9	141-080-25-00	722.13	4	DETENTION BASIN	FLOOD CONTROL
	1167-J4 (TB)			268-010-18-00	904.61			EDWARD NEFF,
1470	MARSHALL	ROAD	EL CAJON	403-271-05-00	907.33			RP COMMUNITIES LLC
949	CHIMNEY ROCK	LANE	ALPINE91901	395-240-05-00	907.14			CHIMNEY ROCK LLP
101917	RAYFORD	DRIVE	ESCONDIDO 92026	187-342-22-00	904.62			HERITAGE OAKS LLC
2363	LAS ARDILLAS		ESCONDIDO 92026	224-291-01-00+	904.62			CHRIS MCCOMIC
16170	RAMBLA DE LAS FLORES		RANCHO SANTA FE 92	268-090-34-00	904.61			LAWRENCE & LORI CAREY
16930	BING CROSBY	BLVD	RANCHO SANTA FE 92	267-050-41-00	905.11			STARWOOD DEVELOPMENT
9804	NORTH VIEW	CT	ESCONDIDO 92026	185-030-51-00	903.13			ROBERT CAMPBELL
1627	109-391-02-00	DRIVE	VISTA 92083	183-320-16-00	904.32			RCM PROPERTIES LLC
3012	VIA VIEJAS OESTE		ALPINE 91901	520-222-19-00	909.26			WILLIAM GRANDE
10333	E. MEADOW GLEN	WAY	ESCONDIDO 92026	186-500-61-00+	903.13			GREYSTONE HIDDEN MEADOWS LLC
16573	VIA LAGO AZUL		RANCHO SANTA FE 92	269-151-35-00	905.11			SG CONSTRUCTION
8228	VIA DORA		RANCHO SANTA FE 92	265-492-45-00	905.11			CAPSTONES ENCLAVE LLC
	1148-G4 (TB)			264-111-03-00+	904.61			LENNAR BRIDGES LLC

### Attachment 4.3 - Treatment Control BMPs

ADDRESS			CITY/ZIP	APN	HSU	CATEGORY (1,2, 3. OR	BMPS IMPLEMENTED	RESPONSIBLE PARTY FOR MAINTENANCE
NUMBER	STREET NAME	SUFFIX						
715	VISTA	AVENUE	ESCONDIDO 92026	227-010-57-00	904.62			PHAP VUONG MONSATERY
16415	HIGHLAND TRAILS		RAMONA 92065	276-100-45-00	905.32			GUY & JOAN MOPPEL
			ESCONDIDO 92025	187-520-12-00	904.62			CRV ESCONDIDO 68 LP
5904	MONTE	ROAD	BONSALL 92003	127-460-02-00	903.12			LARRY LUSHANKO
6064	AVA CUATRO VIENTOS		RANCHO SANTA FE 92026	269-173-37-00	905.12			SG CONSTRUCTION
29432	WELK HIGHLAND	DRIVE	ESCONDIDO 92026	185-460-29-00+	903.13			VEVE INVESTORS LLC
7337	SAN MIGUEL	ROAD	BONITA 91902	585-120-29-00	909.21			ELAINE JACOBS
501	JOSH	WAY	ALPINE 91901	402-281-06-00	907.31			BYRON PERRY
200	PUERTA DE LOMAS		FALLBROOK 92028	121-221-01-00+	903.12			PRESTIGE HOMES LP
5107	MESA TRAIL		LA MESA 91941	495-110-70-00	909.21			KEVIN RANDALL
18178	SR-76		PAUMA VALLEY 92061	132-230-06-00	903.22			JOSEPH ELLIS
12312	SUNBRITE	LANE	LAKESIDE 92040	394-242-32-00+	907.12			VIE LLC
27765	VALLEY CENTER	ROAD	VALLEY CENTER 92088	189-012-18-00+	903.14			NEWLAND COMMUNITIES
8137	WINTER GARDENS	BLVD	LAKESIDE 92040	388-423-09-00	907.13			GA DEVELOPMENT LLC
				395-151-06-00+	907.12			GREEN HILLS RANCH DEV. CO. LLC
980	SANTA FE HIGHLAND	DRIVE	RAMONA 92065	280-140-37-00	905.41			LARRY TRUESDALE
11738	RANCHO HEIGHTS	ROAD	FALLBROOK 92028	109-391-02-00	903.21			JESSIE WYATT
10483	GARDEN WALK	CT	SAN DIEGO 92127	678-050-44-00	905.21			4-S KELWOOD GEN. PARTNERSHIP
1211	DE LUZ	ROAD	FALLBROOK 92028	103-020-04-00	902.21			AL BARTLETT
5444	VISTA DE FORTUNA		RANCHO SANTA FE 92026	265-110-27-00	904.61			S & G CONSTRUCTION LLC
4374	HIGHLAND OAKS	STREET	FALLBROOK 92028	121-351-01-00+	903.12			PRESTIGE HOMES LP
30913	VALLEY CENTER	ROAD	VALLEY CENTER 92088	189-031-03-00	903.16			MICHAEL CREWS DEV. II LLC
13176	MAPLEVIEW	STREET	LAKESIDE 92040	392-140-25-00	903.12			MAPLEVIEW BAPTIST CHURCH
1405	VIA DEL CORVO		SAN MARCOS 92069	222-030-41-00+	904.51			LAKE SAN MARCOS ESTATES
13127	ORCHARD VISTA	ROAD		186-140-47-00	903.14			MIKE HAGG
5510	SAN MIGUEL	ROAD	BONITA 91902	590-190-34-00	909.12			AMES RANCH LLC
1110	SAN MARINO	DRIVE	SAN MARCOS 92069	221-500-10-00	904.52			1ST NAT'L BANK OF N. COUNTY
15202	LA PLATA	COURT	RAMONA 92065	288-672-25-00	907.23			PERVEZ E. VIRJEE
16900	CAMINO SAN BERNARDO		SAN DIEGO 92127	678-242-11-00+	905.11			4-S KELWOOD GEN. PARTNERSHIP

### Attachment 4.3 - Treatment Control BMPs

ADDRESS			CITY/ZIP	APN	HSU	CATEGORY (1, 2, 3, OR	BMPS IMPLEMENTED	RESPONSIBLE PARTY FOR MAINTENANCE
NUMBER	STREET NAME	SUFFIX						
2353	ETHEL WYN	WAY	JULIAN 92036	250-180-37-00	722.40			CHURCH OF JC LDS
29737	MARGALE	LANE	VISTA 92084	172-012-26-00	903.12			LANTEC ENGINEERING
2602	HONEY SPRINGS	ROAD	JAMUL 91935	599-230-15-00	910.36			SUSAN C. HARO
928	SIXTEENTH	STREET	RAMONA 92065	282-273-07-00	905.41			MICHAEL & JANIS YOUNG
6311	SAN MIGUEL	ROAD	BONITA 91902	585-100-15-00	909.12			SWEETWATER AUTHORITY
16722	RANCHO BERNARDO	ROAD	SAN DIEGO 92127	678-241-06-00	905.11			REGENCY CENTERS
14958	HIGHLAND VALLEY	ROAD	ESCONDIDO 92025	276-070-29-00	905.31			PATRICK & ANN CALLAHAN
3582	SR-78		JULIAN 92036	248-190-22-00	907.42			OLD GROVE PROPERTIES
25274	CAMINO DE TIERRA		DESCANSO 91916	407-100-48-00	909.34			MOSS FAMILY TRUST
218	ETCHEVERRY	STREET	RAMONA 92065	282-191-27-00	905.41			DONALD WOOD
16001	VIA DE SANTA FE		RANCHO SANTA FE 92026	269-171-19-00	905.11			RESIDENTIAL CONSTR. FUNDING INC
	MARILLA	DRIVE	LAKESIDE 92040	382-210-32-00+	907.12			WESTERN PACIFIC HOUSING INC
16767	CHRISTOPHER	LANE	JAMUL 91935	599-111-10-00	910.36			MICHAEL A. MCCARTHY
7099	EL CAMINO DEL NORTE		RANCHO SANTA FE 92026	265-231-06-00	905.11			SCOTT & PAMELA JORDAN TRUST
2013	COLINA GRANDE		EL CAJON 92019	515-190-12-00	909.22			CLYNT TAYLOR
17585	RANCHITO DEL RIO		RANCHO SANTA FE 92026	266-041-13-00	904.61			LANCE WAITE
4668	LA NORIA		RANCHO SANTA FE 92026	266-041-14-00	904.61			KACHAY HOMES
3843	BLUEBIRD CANYON	COURT	VISTA 92084	181-181-44-00	904.32			RUSS & JUSTIN WENDT
621	DEHESA MOUNTAIN	LANE	EL CAJON 92021	513-130-23-00+	909.23			ALFRED T. BARRACK, JR.
2090	LAPIS	LANE	RAMONA 92065	279-121-41-00+	905.41			DECA GROUP, INC
	1130-G7 (TB)			241-100-36-00	905.32			PAUL & BONNIE BLANTON
30351	BELLA LINDA	DRIVE	VALLEY CENTER 92088	129-350-40-00	903.12			JOHN JOHNSTON
2365	BUENA CREEK TRAIL		VISTA 92084	181-122-59-00	904.32			GARY GLAZIER, INC
2377	BUENA CREEK TRAIL		VISTA 92084	181-122-60-00	904.32			BLACK MCBRIDE LLC
25445	JESMOND DENE	ROAD	ESCONDIDO 92026	187-280-16-00	904.62			NICK MILLER
5449	LA GRANADA		RANCHO SANTA FE 92026	266-140-19-00	904.61			MONICA HAYNES-FRASER
4055	CONCORDIA	LANE	FALLBROOK 92028	121-061-75-00	903.12			VICENTE RIVAS
3311	VISTA DE LA CRESTA		ESCONDIDO 92029	270-361-47-00	905.21			WILLIAM JUNGMAN
6625	LAGO LINDO		RANCHO SANTA FE 92026	265-220-29-00	902.11			BLUMEN REALTY
26523	TRANQUILITY	LANE	RAMONA 92065	288-641-38-00	907.41			ERICH & CHRISTIE VERHEIJEN
2442	STIRRUP	ROAD	BORREGO SPRINGS 92016	141-192-07-00	722.13			ANSON-ENGLER BUILDERS

### Attachment 4.3 - Treatment Control BMPs

ADDRESS			CITY/ZIP	APN	HSU	CATEGORY (1, 2, 3, OR	BMPs IMPLEMENTED	RESPONSIBLE PARTY FOR MAINTENANCE
NUMBER	STREET NAME	SUFFIX						
				519-093-76-00	910.33			NATHER RABBAN
4374	HIGHLAND OAKS	STREET	FALLBROOK 92028	121-351-01-00	903.12			CHRIS THORESON
20302	LAKE	DRIVE	ESCONDIDO 92029	238-050-02-00	905.21			T-MOBILE USA
40697	DEL LUZ MURRIETA	ROAD	FALLBROOK 92028	101-572-05-00	902.21			PAUL MCGRAW
20409	SR-76			135-230-08-00+	903.22			HIPPOCRATES TRUST
1625	RANCHO JUDITH	ROAD		404-251-58-00	907.33			CHRISTOPHER GRASSA
2555	HUFFSTATLER	STREET		102-412-09-00+	902.23			MIKE GUTIERREZ
3033	VIA ASOLEADO		ALPINE 91901	520-302-03-00	909.31			DAVID WAITLEY
9349	FLINN CREST	STREET	EL CAJON 92021	396-080-42-00	907.14			REGINALD & KAREEN DUQUETTE
4834	BRAM	AVENUE	BONITA 91902	589-120-20-00	909.12			WEI BIN CHEN & SAM MAXIM
11728	JOHNSON LAKE	ROAD	LAKESIDE 92040	375-140-64-00	907.12			FREIHEIT FAMILY TRUST
2883	RUE MONTREUX		ESCONDIDO 92026	187-280-76-00	904.62			CRV ESCONDIDO 68 LP
321	ROCKHILL	DRIVE	VISTA 92084	177-091-11-00	904.22			DAVID & ELIZABETH SPENCE
1315	WEST GRANITE MOUNTAIN	ROAD	JULIAN 92036	251-120-49-00	722.40			DAVID HUHN
16562	HIGHLAND VALLEY	ROAD	RAMONA 92065	277-042-19-00	905.41			RICHARD KUBISCHTA
2543	VALERIE	DRIVE	FALLBROOK 92028	107-240-74-00	903.12			WILLIAM PAKOSTA
4633	OLIVE HILL	ROAD	FALLBROOK 92028	121-352-21-00	903.12			MARK DERRIGO
1412	LA CRESTA	BLVD	EL CAJON 92021	509-131-02-00	909.23			JOE HART
9115	MOUNT ISRAEL	ROAD	ESCONDIDO 92029	264-130-45-00	904.61			RICHARD BRADY
36549	OLD HIGHWAY 80		PINE VALLEY 91962	609-040-09-00	911.83			LEVEL (3) COMMUNICATIONS
31392	LAKE VISTA TRAIL		BONSALL 92003	126-443-05-00	903.12			RON ARESTAD
14843	EL MONTE	ROAD	LAKESIDE 92040	393-011-06-00	907.15			CLARENCE FOSTER
5315	VALLE VISTA	DRIVE	LA MESA 91941	491-471-03-00	909.12			CHARLIE MCROBERTS
1381	LAS VISTAS	ROAD	FALLBROOK 92028	105-680-66-00	909.22			STEVE HERR
2294	JOHNS VIEW	WAY	SPRING VALLEY 91977	578-031-83-00+	909.12			KOSTAS LITHOPOULOS
3254	RESERVOIR	DRIVE	JAMUL 91935	596-061-10-00	909.21			TERRY PETERSON
6748	LAS COLINAS		RANCHO SANTA FE 92026	267-080-13-00	905.11			CRAIG & JAN CLARK
15102	TOMBSTONE CREEK	ROAD	EL CAJON 92021	393-142-08-00	907.14			STEPHEN DAVIS
14821	RANCHO VALENCIA VISTA		RANCHO SANTA FE 92026	303-014-16-00	905.11			CHRISTOPHER COLLINS
29524	WEST MEADOW GLEN	WAY	ESCONDIDO 92026	185-412-31-00+	903.13			RIMROCK DEVELOPMENT
17576	RANCHO LA NORIA		RANCHO SANTA FE 92026	266-040-26-00	904.61			BT SACR INC
20424	FORTUNA DEL SUR			223-331-05-00	904.61			KIMCEE MCANALLY TRUST

### Attachment 4.3 - Treatment Control BMPs

ADDRESS			CITY/ZIP	APN	HSU	CATEGORY (1,2, 3, OR	BMPS IMPLEMENTED	RESPONSIBLE PARTY FOR MAINTENANCE
NUMBER	STREET NAME	SUFFIX						
16838	GOING MY WAY		SAN DIEGO 92127	267-180-70-00+	905.11			CALIFORNIA COVE COMMUNITIES, INC
1696	CAMINO DE NOG(ALES?)		FALLBROOK 92028	106-200-80-00	903.12			AL BARTLETT
				133-391-10-00	903.16			MARK & MARY MILLER
1574	CHANDELLE	LANE	FALLBROOK 92028	105-491-20-00	902.22			MARK KIRK
1972	WILLOW GLEN	DRIVE	EL CAJON 92019	517-031-12-00	909.21			BRIAN SHAEFFER
	1048-E4 (TB)			124-351-52-00	903.12			DIMITRI & KIRK DIFFENDALE LLC
	1048-E4 (TB)			124-351-54-00	903.12			DIMITRI & KIRK DIFFENDALE LLC
421	PASO DEL NORTE		ESCONDIDO 92026	187-181-08-00	904.62			MATTHEW HEINTSCHEL
14086	LAS PALMAS	ROAD	JAMUL 91935	597-041-53-00	910.33			JAMES O'KREY
2002	CLOVERDALE	ROAD	ESCONDIDO 92027	241-120-10-00+	905.32			GREGORY KRAUSE
17137	CAMINO ACAMPO		RANCHO SANTA FE 92026	269-161-19-00	905.11			FRANK SEGLER
16722	RANCHO BERNARDO	ROAD	SAN DIEGO 92127	678-241-06-00	905.11			REGENCY CENTERS, ZEP PULCHALSKI
	1048-E4 (TB)			124-351-53-00	903.12			DIMITRI & KIRK DIFFENDALE LLC
39028	MAGEE	ROAD	PALA 92059	109-401-38-00	903.21			BRYAN SHAW
6833	LAS COLINAS		RANCHO SANTA FE 92026	267-080-24-00	905.11			DARIUSH & MARIA RAZAVI
16212	PARAGON MESA	ROAD	POWAY 92064	323-110-47-00	906.20			BRIAN ZUBLIN, FUNG MING
1110	SAN MARINO	DRIVE	SAN MARCOS 92069	221-500-10-00	904.52			1ST NAT'L BANK OF N. COUNTY
17475	LOS MORROS		RANCHO SANTA FE 92026	266-091-17-00	904.61			PER & KAREN PETERSON TRUST
2013	OLD BEND	ROAD	EL CAJON 92021	508-180-12-00	907.13			DDH LLC
848	CANYON RIM	DRIVE	EL CAJON 92021	510-021-06-00+	909.23			DANA FERRELL
4403	ASTRA	WAY	LA MESA 91941	497-190-69-00	909.21			TIM DOUDNA
880	TAVERN	ROAD	ALPINE 91901	403-380-65-00+	907.33			TOM DYKE
4347	CITRUS	LANE	FALLBROOK 92028	107-080-64-00	903.12			JOHN DILEVA
3021	SKYCREST	DRIVE	FALLBROOK 92029	124-210-25-00	903.12			STEVEN & PHYLLIS ZENZ
9910	SAGE HILL	WAY	ESCONDIDO 92026	186-410-24-00	903.13			MICHAEL STEPIEN
9504	WELK VIEW	COURT	ESCONDIDO 92026	185-460-18-00	903.13			RIMROCK DEVELOPMENT

**Attachment 4.4 – Self Verification Documents**  
Updated June 30, 2010



# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM BIOFILTERS

1. Transcribe the following information from your notification letter and make corrections as necessary:

Permit No.: \_\_\_\_\_

**BMP Location:**

**Responsible Party:** \_\_\_\_\_

**Phone Number:**   (         )                      ☐ Check here for Phone Number Change

**Responsible Party Address:**

☐ *Check here for Address Change*

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. *Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).*

4. Sign the bottom of the form and return to: County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

**Signature of Responsible Party**

---

**Print Name**

Date \_\_\_\_\_

# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM BIOFILTERS – SIDE 2

The following list of typical maintenance indicators and maintenance activities for biofilters is provided for your reference.

<b>Biofilter BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-establish vegetation.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation (typically 4-6 inches for grass).
Erosion due to concentrated irrigation flow	Repair/re-seed eroded areas and adjust the irrigation system.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or re-grading where necessary.
Standing water (BMP not draining)	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet, or outlet structures	Repair or replace as applicable.

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
INFILTRATION SYSTEM**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party      Print Name      Date

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
INFILTRATION – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for infiltration BMPs is provided for your reference. There are many types of infiltration BMPs including basins that store storm water runoff in above-ground ponding areas until it infiltrates into the surrounding soils, and gravel-filled trenches or wells that store storm water runoff in the gravel reservoir until it infiltrates into the surrounding soils. This BMP category also includes permeable paving areas that store storm water runoff in a gravel reservoir under the permeable paving surface.

<b>Infiltration BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris in infiltration basin, pre-treatment device, or on surface of porous pavement, as applicable	Remove and properly dispose of accumulated materials.
Standing water in infiltration basin	Remove and replace clogged surface soils.
Standing water in infiltration trench, dry well, or subsurface reservoir bed	Flush fine sediment from gravel storage area.
Standing water in permeable paving area	Flush fine sediment from paving and subsurface gravel.
Damage to permeable paving surface resulting in reduced storm water intake capacity	Repair or replace damaged surface as appropriate.

When inspection or maintenance indicates sediment is accumulating in an infiltration BMP, the watershed draining to the infiltration BMP should be examined to determine the source of the sediment, and corrective measures should be made as applicable to minimize the sediment supply.

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
HYDRODYNAMIC SEPARATORS**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party      Print Name      Date

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
HYDRODYNAMIC SEPARATORS – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for hydrodynamic separators is provided for your reference.

<b>Hydrodynamic Separator BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Accumulation of floating oil and grease	Remove and properly dispose of oil and grease.
Spent or clogged sorbent material or media pack	Remove and properly dispose of sorbent material or media pack, and replace with fresh material. These materials/media are potentially hazardous and must be handled by a properly trained contractor.
Damage to components of the hydrodynamic separator	Repair or replace as applicable.

Maintenance of hydrodynamic separators involves handling of potentially hazardous material (oil and/or oil sorbent material), which requires special disposal. Additionally, maintenance may involve entry into the hydrodynamic separator underground. Therefore the maintenance operator must be trained in handling and disposal of hazardous waste, and must also be certified for confined space entry if the maintenance will require entry into the hydrodynamic separator. Therefore it is recommended that private BMP owners obtain a maintenance contract with a qualified contractor to provide inspection and maintenance. There are several storm drain cleaning service providers who are able to inspect and/or maintain hydrodynamic separators. Contact the manufacturer of the hydrodynamic separator to find qualified service providers.

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
FILTRATION DEVICES**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (       ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change      Number      Street Name & Suffix      City/Zip

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:      County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

Signature of Responsible Party      Print Name      Date

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
FILTRATION – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for filtration BMPs is provided for your reference.

<b>Filtration BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Accumulation of floating oil and grease	Remove and properly dispose of oil and grease.
Clogged filter media	Remove and properly dispose of filter media, and replace with fresh media.
Damage to components of the filtration system	Repair or replace as applicable.

Maintenance of filtration BMPs involves handling of potentially hazardous material (oil and/or oil sorbent material), which requires special disposal. Additionally, maintenance may involve entry into the filtration BMP underground. Therefore the maintenance operator must be trained in handling and disposal of hazardous waste, and must also be certified for confined space entry if the maintenance will require entry into the filtration BMP. Therefore it is recommended that private BMP owners obtain a maintenance contract with a qualified contractor to provide inspection and maintenance. There are several storm drain cleaning service providers who are able to inspect and/or maintain filtration BMPs. Contact the manufacturer of the filtration system to find qualified service providers.



**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
DRAINAGE INSERTS**

1. Transcribe the following information from your notification letter and make corrections as necessary:

**Permit No.:** \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:** (     ) \_\_\_\_\_ ☐ Check here for Phone Number Change

**Responsible Party Address:** \_\_\_\_\_

☐ Check here for Address Change

Number	Street Name & Suffix	City/Zip
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2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:

County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

**Signature of Responsible Party**

**Print Name**

**Date**

**PRIVATE TREATMENT CONTROL BMP  
OPERATION AND MAINTENANCE VERIFICATION FORM  
DRAINAGE INSERTS – SIDE 2**

The following list of typical maintenance indicators and maintenance activities for drainage inserts is provided for your reference.

<b>Drainage Insert BMPs Inspection and Maintenance Checklist</b>	
<b>Typical Maintenance Indicators</b>	<b>Typical Maintenance Actions</b>
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Spent or clogged sorbent material or media pack	Remove and properly dispose of sorbent material or media pack, and replace with fresh material. These materials/media are potentially hazardous and must be handled by a properly trained contractor.
Damage to components of the drainage insert	Repair or replace as applicable.

Maintenance of drainage inserts involves handling of potentially hazardous material (oil sorbent material), which requires special disposal. Additionally, maintenance may involve entry into the storm drain inlet underground. Therefore the maintenance operator must be trained in handling and disposal of hazardous waste, and must also be certified for confined space entry if the maintenance will require entry into the storm drain inlet. Therefore it is recommended that private BMP owners obtain a maintenance contract with a qualified contractor to provide inspection and maintenance. There are several storm drain cleaning service providers who are able to inspect and/or maintain drainage inserts. Contact the manufacturer of the drainage insert to find qualified service providers.

# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM DETENTION SYSTEM

1. Transcribe the following information from your notification letter and make corrections as necessary:

Permit No.: \_\_\_\_\_

**BMP Location:** \_\_\_\_\_

**Responsible Party:** \_\_\_\_\_

**Phone Number:**    (       )                      ☐ Check here for Phone Number Change

**Responsible Party Address:**

☐ *Check here for Address Change*

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. *Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).*

4. Sign the bottom of the form and return to: County of San Diego Watershed Protection Program  
Treatment Control BMP Tracking  
5201 Ruffin Road, Suite P, MS 0326  
San Diego, CA 92123

**Signature of Responsible Party**

Print Name \_\_\_\_\_

Date \_\_\_\_\_

# PRIVATE TREATMENT CONTROL BMP OPERATION AND MAINTENANCE VERIFICATION FORM DETENTION – SIDE 2

The following list of typical maintenance indicators and maintenance activities for detention basins is provided for your reference.

Detention BMPs Inspection and Maintenance Checklist	
Typical Maintenance Indicators	Typical Maintenance Actions
Poor vegetation establishment	Re-seed, re-establish vegetation.
Overgrown vegetation	Mow or trim as appropriate.
Erosion due to concentrated irrigation flow	Repair/re-seed eroded areas and adjust the irrigation system.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or re-grading where necessary.
Gopher holes	Repair/re-seed holes and make appropriate corrective measures to prevent rodent activity.
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Standing water (BMP not draining)	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, or re-grading for proper drainage.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet, or outlet structures	Repair or replace as applicable.