



San Bernardino County Public Works Department

WATER QUALITY MANAGEMENT PLAN TEMPLATE *FOR THE MOJAVE WATERSHED*

WATER QUALITY MANAGEMENT PLAN (WQMP)

For compliance with State Water Resources Control Board

Water Quality Order No. 2003-0005-DWQ

WDID No. 6B36SM40301

for

Project Name

Prepared for:

Name of Owner

Address for Project Location

City, State, Zip for Project Location

Phone #

APN or Tract

Prepared By:

Name of Preparer/Company

Address of Preparer/Company

City, State, Zip for Preparer/Company

Phone Number of Preparer/Company

WQMP Preparation Date

Date

WATER QUALITY MANAGEMENT PLAN (WQMP)

PROJECT SITE INFORMATION

Name of Project: _____

Project Location: _____

Size of Significant Re-Development on an Already Developed Site (in feet²): _____

Size of New Development (in feet²): _____

Number of Home Subdivisions: _____

SIC Codes: _____

Erosive Site Conditions?: _____

Natural Slope More Than 25%?: _____

WATER QUALITY MANAGEMENT PLAN (WQMP)

Check the appropriate project category below:

**Check
below**

Project Categories

	1. All significant re-development projects. Significant re-development is defined as the addition or creation of 5,000 or more square feet of impervious surface on an already developed site. This includes, but is not limited to, additional buildings and/or structures, extension of existing footprint of a building, construction of parking lots, etc. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMPs, the design standards apply only to the addition, and not the entire development. When the redevelopment results in an increase of more than fifty percent of the impervious surfaces, then a WQMP is required for the entire development (new and existing).
	2. Home subdivisions of 10 units or more. This includes single family residences, multi-family residence, condominiums, apartments, etc.
	3. Industrial/commercial developments of 100,000 square feet or more. Commercial developments include non-residential developments such as hospitals, educational institutions, recreational facilities, mini-malls, hotels, office buildings, warehouses, and light industrial facilities.
	4. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532- 7534, 7536-7539).
	5. Restaurants where the land area of development is 5,000 square feet or more.
	6. Hillside developments of 10,000 square feet or more which are located on areas with known erosive soil conditions or where the natural slope is twenty-five percent or more.
	7. Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas such as areas designated in the Ocean Plan as areas of special biological significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.
	8. Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary storage of motor vehicles.
	The project does not fall into any of the categories described above. (If the project requires a precise plan of development [e.g. all commercial or industrial projects, residential projects of less than 10 dwelling units, and all other land development projects with potential for significant adverse water quality impacts] or subdivision of land, it is defined as a Non-Category Project.)

Section 1

Introduction And Project Description

1.1 Project Information

- Name of project owner.
- Address of project owner.
- Telephone for project owner.
- Project site address.

1.2 Permits

- List all tract or permit number(s), condition number(s), and any acquired waste discharge identification numbers (WDIDs) pertaining to project.

1.3 Project Description

- Provide a detailed project description include following:
 - Land-use type
 - Project size.
 - Homeowners association or property owner association formation.
- Include location map and site plan identifying storm drain facilities and structures, structural BMPs, stormwater flow (drainage), and the receiving water. The location and site plan may be shown on the same map.

1.4 Site Description

- Describe and identify the watershed(s) that the project lies within.
- Include any pre-existing water quality problems that have been identified.

Section 2

Pollutants of concern

2.1 Pollutants of Concern (NOT REQUIRED FOR NON-CATEGORY PROJECTS)

List all expected pollutants of concern for the project site as directed below:

- List all expected and potential pollutants using Table 2-1 (below).
- List any other pollutants of concern from the project site not listed in Tables 2-1.
- Identify pollutants of concern in the receiving waters as follows:
 1. For each of the proposed project discharge points, identify the proximate receiving water for each point of discharge and all downstream receiving waters, using hydrologic unit basin numbers as identified in the most recent version of the Water Quality Control

Plan for the Lahontan Basin prepared by the Lahontan Regional Water Quality Control Board (LRWQCB).

2. Identify each proximate and downstream receiving water identified above that is listed on the most recent list of Clean Water Act Section 303(d) (CWA 303(d) list) impaired water bodies (Attachment B, Table B-1). List any and all pollutants for which the receiving waters are impaired.
3. Compare the list of pollutants for which the receiving waters are impaired with the pollutants expected to be generated by the project (and listed above).
4. List all pollutants that are expected or potential from the project site, and for which the receiving waters are impaired.
5. Summarize identified pollutants of concern by checking the applicable boxes in the following table. (For identified pollutants of concern that are causing an impairment in receiving waters, the project WQMP shall incorporate one or more Treatment Control BMPs of medium or high effectiveness in reducing those pollutants.)

Pollutant of Concern Summary Table

Pollutant Type	Expected	Potential	Listed for Receiving Water
Bacteria/Virus			
Heavy Metals			
Nutrients			
Pesticides			
Organic Compounds			
Sediments			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Other—specify pollutant(s):			

Table 2-1 (adapted from OC 2003) Pollutants of Concern for Project Categories and Land Uses									
Project Categories/Land Uses	General Pollutant Categories								
	Bacteria/Virus	Heavy Metals	Nutrients	Pesticides	Organic Compounds	Sediments	Trash & Debris	Oxygen Demanding Substances	Oil & Grease
Residential Development (Detached)	E	N	E	E	N	E	E	E	E
Residential Development (Attached)	P	N	E	E	N	E	E	P ⁽¹⁾	P ⁽²⁾
Industrial/Commercial Development (>100,000 ft ²)	P ⁽³⁾	P	P ⁽¹⁾	P ⁽¹⁾	P ⁽⁵⁾	P ⁽¹⁾	E	P ⁽¹⁾	E
Automotive Repair Shops	N	P	N	N	E ^(4,5)	N	E	N	E
Restaurants (>5,000 ft ²)	E	N	N	N	N	N	E	E	E
Hillside Development (>10,000 ft ²)	E	N	E	E	N	E	E	E	E
Parking Lots (>5,000 ft ²)	P ⁽⁶⁾	E	P ⁽¹⁾	P ⁽¹⁾	E ⁽⁴⁾	P ⁽¹⁾	E	P ⁽¹⁾	E
Streets/Highways/Freeways	P ⁽⁶⁾	E	P ⁽¹⁾	P ⁽¹⁾	E ⁽⁴⁾	E	E	P ⁽¹⁾	E

KEY:

E = expected.
P = potential.
N = not expected

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

SECTION 3 BEST MANAGEMENT PRACTICE SELECTION PROCESS

3.1 SITE DESIGN BMPS

For listed Site Design BMPs, indicate in the following table whether it will be used (yes/no) and describe how used, or, if not used, provide justification/alternative. Provide detailed descriptions of planned Site Design BMPs, if applicable.

1. Minimize Stormwater Runoff, Minimize Project's Impervious Footprint, and Conserve Natural Areas		
Maximize the permeable area. This can be achieved in various ways, including but not limited to, increasing building density (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces.		
Yes	No	
Describe actions taken or justification/alternative:		
Runoff from developed areas may be reduced by using alternative materials or surfaces with a lower Coefficient of Runoff, or "C-Factor".		
Yes	No	
Describe actions taken or justification/alternative:		
Conserve natural areas. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition.		
Yes	No	
Describe actions taken or justification/alternative:		

Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.		
Yes	No	
Describe actions taken or justification/alternative:		
Construct streets, sidewalks, and parking lot aisles to the minimum widths necessary, provided that public safety and a pedestrian friendly environment are not compromised ¹ . Incorporate landscaped buffer areas between sidewalks and streets.		
Yes	No	
Describe actions taken or justification/alternative:		
Reduce widths of street where off-street parking is available ² .		
Yes	No	
Describe actions taken or justification/alternative:		
Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.		
Yes	No	
Describe actions taken or justification/alternative:		

¹ Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements.

² However, street widths must still comply with life safety requirements for fire and emergency vehicle access.

Other comparable site design options that are equally effective.		
Describe actions taken _or justification/alternative:		
Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.		
Yes	No	
Describe actions taken _or justification/alternative:		
Use natural drainage systems.		
Yes	No	
Describe actions taken or justification/alternative:		
Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration ³ .		
Yes	No	
Describe actions taken or justification/alternative:		
Construct onsite ponding areas, rain gardens, or retention facilities to increase opportunities for infiltration, while being cognizant of the need to prevent the development of vector breeding areas.		
Yes	No	
Describe actions taken or justification/alternative:		

³However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff. Infiltration areas may be subject to regulation as Class V injection wells and may require a report to the USEPA. Consult the Agency for more information on use of this type of facility.

2. Minimize Directly Connected Impervious Areas		
Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.		
Yes	No	
Describe actions taken or justification/alternative:		
Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.		
Yes	No	
Describe actions taken or justification/alternative:		
Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.		
Yes	No	
Describe actions taken or justification/alternative:		
Use one or more of the following:		
Yes	No	Design Feature
		Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings
		Urban curb/swale system; street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.
		Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to municipal storm drain systems.
		Other comparable design concepts that are equally effective.
Describe actions taken or justification/alternative:		

Use one or more of the following features for design of driveways and private residential parking areas:		
Yes	No	Design Feature
		<ul style="list-style-type: none"> ▪ Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the municipal storm drain system.
		<ul style="list-style-type: none"> ▪ Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface; or designed to drain into landscaping prior to discharging to the municipal storm drain system.
		<ul style="list-style-type: none"> ▪ Other comparable design concepts that are equally effective.
Describe actions taken_or justification/alternative:		

Use one or more of the following design concepts for the design of parking areas:		
Yes	No	Design Feature
		Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.
		Overflow parking (parking stalls provided in excess of the Agency's minimum parking requirements) may be constructed with permeable paving.
		Other comparable design concepts that are equally effective.
Describe actions taken_or justification/alternative:		

3.2 SOURCE CONTROL BMPS

Complete the following selection table for Source Control BMPs, by checking boxes that are applicable. All listed BMPs shall be implemented for the project. Where a required Source Control BMP is not applicable to the project due to project characteristics, justification and/or alternative practices for preventing pollutants must be provided. In addition to completing the following tables, provide detailed descriptions on the implementation of planned Source Control BMPs.

Project Category	Source Control BMPs																										
	Education of Property Owners	Activity Restrictions	Spill Contingency Plan	Employee Training/Education Program	Street Sweeping Private Street and Parking Lots	Common Areas Catch Basin Inspection	Landscape Planning (SD-10)	Hillside Landscaping	Roof Runoff Controls (SD-11)	Efficient Irrigation (SD-12)	Protect Slopes and Channels	Storm Drain Signage (SD-13)	Inlet Trash Racks	Energy Dissipaters	Trash Storage Areas (SD-32) and Litter Control	Fueling Areas (SD-30)	Air/Water Supply Area Drainage	Maintenance Bays and Docks (SD-31)	Vehicle Washing Areas (SD-33)	Outdoor Material Storage Areas (SD-34)	Outdoor Work Areas (SD-35)	Outdoor Processing Areas (SD-36)	Wash Water Controls for Food Preparation Areas	Pervious Pavement (SD-20)	Alternative Building Materials (SD-21)		
Significant Re-development																											
Home subdivisions of 10 or more units																											
Commercial/Industrial Development >100,000 ft ²																											
Automotive Repair Shop																											
Restaurants																											
Hillside Development >10,000 ft ²																											
Development of impervious surface >2,500 ft ²																											
Parking Lots >5,000 ft ² of exposed storm water																											
* Provide justification of each Source Control BMP that will not be incorporated in the project WQMP, or explanation of proposed equally effective alternatives in the following table.																											

Justification for Source Control BMPs not incorporated into the project WQMP			
Source Control BMP	Used in Project (yes/no)?	Justification/Alternative*	Implementation Description
Education of Property Owners			
Activity Restrictions			
Spill Contingency Plan			
Employee Training/Education Program			
Street Sweeping Private Street and Parking Lots			
Common Areas Catch Basin Inspection			
Landscape Planning (SD-10)			
Hillside Landscaping			
Roof Runoff Controls (SD-11)			
Efficient Irrigation (SD-12)			
Protect Slopes and Channels			
Storm Drain Signage (SD-13)			
Inlet Trash Racks			
Energy Dissipaters			
Trash Storage Areas (SD-32) and Litter Control			
Fueling Areas (SD-30)			
Air/Water Supply Area Drainage			
Maintenance Bays and Docks (SD-31)			
Vehicle Washing Areas (SD-33)			
Outdoor Material Storage Areas (SD-34)			
Outdoor Work Areas (SD-35)			
Outdoor Processing Areas (SD-36)			
Wash Water Controls for Food Preparation Areas			
Pervious Pavement (SD-20)			
Alternative Building Materials (SD-21)			
*Attach additional sheets if necessary for justification.			

4.1 TREATMENT CONTROL BMPS (Not required for Non-Category projects)

- Complete the following Treatment Control BMPs Selection Matrix. For each pollutant of concern enter “yes” if identified in Section 2.1, above, or “no” if not identified for the project. Check the boxes of selected BMPs that will be implemented for the project to address each pollutant of concern from the project as listed above in section 2.1. Treatment Control BMPs must be selected and installed with respect to identified pollutant characteristics and concentrations that will be discharged from the site. For any identified pollutants of concern not listed in the Treatment Control BMP Selection Matrix, provide an explanation of how they will be addressed by Treatment Control BMPs. For identified pollutants of concern that are causing an impairment in receiving waters (as identified in Section 2.1, above), the project WQMP shall incorporate one or more Treatment Control BMPs of medium or high effectiveness in reducing those pollutants. It is the responsibility of the project proponent to demonstrate, and document in the project WQMP, that all pollutants of concern will be fully addressed. The Agency may require information beyond the minimum requirements of this WQMP to demonstrate that adequate pollutant treatment is being accomplished.

- In addition to completing the Selection Matrix, provide detailed descriptions on the location, implementation, installation, and long-term O&M of planned Treatment Control BMPs.

Treatment Control BMP Selection Matrix

Pollutant of Concern	Treatment Control BMP Categories							
	Biofilters	Detention Basins ⁽²⁾	Infiltration Basins ⁽³⁾	Wet Ponds or Wetlands	Filtration	Water Quality Inlets	Hydrodynamic Separator Systems ⁽⁴⁾	Manufactured/ Proprietary Devices
Sediment/Turbidity	H/M	M	H/M	H/M	H/M	L	H/M (L for turbidity)	U
Yes/No?								
Nutrients	L	M	H/M	H/M	L/M	L	L	U
Yes/No?								
Organic Compounds	U	U	U	U	H/M	L	L	U
Yes/No?								
Trash & Debris	L	M	U	U	H/M	M	H/M	U
Yes/No?								
Oxygen Demanding Substances	L	M	H/M	H/M	H/M	L	L	U
Yes/No?								
Bacteria & Viruses	U	U	H/M	U	H/M	L	L	U
Yes/No?								
Oils & Grease	H/M	M	U	U	H/M	M	L/M	U
Yes/No?								
Pesticides (non-soil bound)	U	U	U	U	U	L	L	U
Yes/No?								
Metals	H/M	M	H	H	H	L	L	U
Yes/No?								

4.2 BMP DESIGN CRITERIA

- The following Treatment Control BMP(s) (Flow Based or Volume Based) will be implemented for this project (***check “Implemented” box, if used***):

Design Basis of Treatment Control BMPs

Implemented	Treatment Control BMP	Design Basis
	Vegetated Buffer Strips	Flow Based
	Vegetated Swale	
	Multiple Systems	
	Manufactured/Proprietary	
	Bioretention	Volume Based
	Wet Pond	
	Constructed Wetland	
	Extended Detention Basin	
	Water Quality Inlet	
	Retention/Irrigation	
	Infiltration Basin	
	Infiltration Trench	
	Media Filter	
	Manufactured/Proprietary	

4.2.1 Flow Based Design Criteria

- Calculate the BMP design flow by using the method described in Attachment D, Section A. Show calculations in detail—attach a separate sheet of calculations.

4.3.2 Volume-Based Design Criteria

- Calculate the required capture volume of the BMP using the method described in Attachment D, Section B. Show calculations in detail—attach a separate sheet of calculations.

Section 5 Operation and Maintenance

5.1 Operations and Maintenance

Operation and maintenance (O&M) requirements for all Source Control, Site Design, and Treatment Control BMPs shall be identified within the WQMP. The WQMP shall include the following:

5.1.1 O&M DESCRIPTION AND SCHEDULE THAT MUST:

- List and identify each BMP that requires O&M.
- Provide a thorough description of O&M activities (include the O&M process, and the handling and placement of any wastes).
- Include BMP start-up dates.
- Provide a schedule of the frequency of O&M for each BMP.

5.1.2 INSPECTION & MONITORING REQUIREMENTS THAT MUST:

- Provide thorough descriptions of water quality monitoring (if locally required).
- Provide self-inspections and record keeping requirements for BMPs (review local specific requirements regarding self-inspections and/or annual reporting), including identification of responsible parties for inspection and record keeping.
-

5.1.3 IDENTIFICATION OF RESPONSIBLE PARTIES THAT MUST:

- Provide the party or parties that will be responsible for each BMP O&M. For each responsible party, include the party's name, address, contact name and telephone number.

SECTION 6 FUNDING

6.1 Funding

The Permit requires that for all Treatment Control BMPs, a funding source or sources for operation and maintenance of each BMP be identified within the WQMP. Project proponents must:

- Indicate funding sources or sources for O&M for this project. For each funding source, include the responsible party's name, address, contact name and telephone number.

SECTION 7
WQMP Certification

7.1 Certification

- The applicant is required to sign and certify that the WQMP is in conformance with State Water Resources Control Board, Water Quality Order No. 2003-0005-DWQ.
- The applicant is required to sign and date the following statement ‘word-for-word’ certifying that the provisions of the WQMP have been accepted by the applicant and that the applicant will have the plan transferred to future successors (transferability statement). The certification must be signed by the property owner, unless a written designation by the owner allows a designee to sign on the owner’s behalf.

“This Water Quality Management Plan has been prepared for (Owner/Developer Name) by (Consulting /Engineering Firm Name). It is intended to comply with the County of San Bernardino requirements for Tract/Parcel Map No. _____, Condition Number(s) _____ requiring the preparation of a Water Quality Management Plan (WQMP). The undersigned is aware that Best Management Practices (BMPs) are enforceable pursuant to the County’s Water Quality Ordinance No. 3587. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with Phase II General Permit and the intent of the water quality regulations applicable to San Bernardino County areas within the Lahontan region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the current approved WQMP shall be available on the subject site in perpetuity.

“I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors.”

Applicant’s Signature

Date

Applicant’s Name

Applicant’s Telephone Number

Attachment A-1

Maintenance Mechanisms

A-1.1 The Agency shall not accept stormwater structural BMPs as meeting the WQMP requirements standard, unless an O&M Plan is prepared (see WQMP Section 2.6) and a mechanism is in place that will ensure ongoing long-term maintenance of all structural and non-structural BMPs. This mechanism can be provided by the Agency or by the project proponent. As part of project review, if a project proponent is required to include interim or permanent structural and non-structural BMPs in project plans, and if the Agency does not provide a mechanism for BMP maintenance, the Agency shall require that the applicant provide verification of maintenance requirements through such means as may be appropriate, at the discretion of the Agency, including, but not limited to covenants, legal agreements, maintenance agreements, conditional use permits and/or funding arrangements (OC 2003)

A-1.2 Maintenance Mechanisms

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

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

2. **Project proponent agreement to maintain stormwater BMPs:** The Agency may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the stormwater BMP as necessary into perpetuity. Security or a funding mechanism with a “no sunset” clause may be required.
3. **Assessment districts:** The Agency may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for stormwater

BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.

4. **Lease provisions:** In those cases where the Agency holds title to the land in question, and the land is being leased to another party for private or public use, the Agency may assure stormwater BMP maintenance, repair and replacement through conditions in the lease.
5. **Conditional use permits:** For discretionary projects only, the Agency may assure maintenance of stormwater BMPs through the inclusion of maintenance conditions in the conditional use permit. Security may be required.
6. **Alternative mechanisms:** The Agency may accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

Attachment A-2



INSTRUCTIONS FOR COMPLETING THE WATER QUALITY MANAGEMENT PLAN (WQMP) TRANSFER, ACCESS, AND MAINTENANCE AGREEMENT

1. In order for your project to receive approval, you will need to prepare a Water Quality Management Plan (WQMP) Transfer, Access and Maintenance Agreement (sample provided). This agreement should follow the format provided, and include the following information and attachments:
 - Completion of the document including signature(s)
 - Wet seal notarizing the document
 - Exhibit "B" an 8.5" x 11" or 8.5" x 14" detail BMP site map of the project illustrate the BMP features and maintenance/access points. Include cross section and detail of the onsite BMP's
2. A draft of the agreement should be submitted for review to:

Department of Public Works
Environmental Management Division
825 E. Third Street, Room 201
San Bernardino, CA 92415-0835
Phone: (909) 387-8109
3. Staff at the Environmental Management Division will review the draft Agreement to make sure it is complete, and will request any necessary changes.
4. When the draft has been cleared, the property owner must sign the Agreement and have his/her signature notarized.
5. The Agreement will then be returned to the Environmental Management Division, who will obtain the notarized signature of the Director of Public Works (this may take up to a week, depending on the Director's schedule and availability of the Notary). When ready, the Agreement can be mailed or picked-up in person.
6. The fully executed Agreement must now be recorded at the San Bernardino County Recorder's Offices at:

222 W. Hospitality Lane (behind the Souplantation restaurant)
San Bernardino, CA 92415-0018
Phone: (909) 387-8322
7. A photocopy of the final recorded Agreement should be returned to the Environmental Management Division. You will need to show the recorded agreement to the Land Development Division of the Department of Public Works in order to receive their sign-off on your project.

RECORDING REQUESTED BY:

COUNTY OF SAN BERNARDINO

AND WHEN RECORDED MAIL TO:

County of San Bernardino
Public Works Department
825 E. Third Street
San Bernardino, CA 92415

SPACE ABOVE THIS LINE FOR RECORDER'S USE

AGREEMENT

**THIS PAGE ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING
INFORMATION (Additional Recording Fees Apply)**

**Water Quality Management Plan and Stormwater Best Management Practices
Transfer, Access and Maintenance Agreement**

OWNER NAME: _____

PROPERTY ADDRESS: _____

APN: _____

THIS AGREEMENT is made and entered into in

_____, California, this _____ day of
_____, by and between
_____, herein after

referred to as Owner and the COUNTY OF SAN BERNARDINO, a municipal corporation, located in the County of San Bernardino, State of California hereinafter referred to as County;

WHEREAS, the Owner owns real property (“Property”) in the County of San Bernardino,, State of California, more specifically described in Exhibit “A” and depicted in Exhibit “B”, each of which exhibits is attached hereto and incorporated herein by this reference;

WHEREAS, at the time of initial approval of development project known as _____ within the Property described herein, the County required the project to employ Best Management Practices, hereinafter referred to as “BMPs,” to minimize pollutants in urban runoff;

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

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

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is

required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

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

1. All maintenance or replacement of BMPs proposed as part of the WQMP are the sole responsibility of the Owner in accordance with the terms of this Agreement.
2. Owner hereby provides the County of San Bernardino's designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by the Public Works Director, no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. The County shall make every effort at all times to minimize or avoid interference with Owner's use of the Property. Denial of access to any premises or facility that contains WQMP features is a violation of the County Stormwater Ordinance, County Code 3587. If there is reasonable cause to believe that an illicit discharge or breach of the WQMP operation and maintenance commitments is occurring on the premises then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction in addition to other enforcement actions.
3. Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the County, the Owner shall provide the County with documentation identifying the material(s) removed, the quantity, and disposal destination.
4. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the County, the County is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense against the property and/or to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the County Code from the date of the notice of expense until paid in full.
5. The County may require the owner to post security in form and for a time period satisfactory to the County to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the

County may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Public Works Director may withdraw any previous stormwater-related approval with respect to the property on which BMPs have been installed and/or implemented until such time as Owner repays to County its reasonable costs incurred in accordance with paragraph 3 above.

6. This agreement shall be recorded in the Office of the Recorder of San Bernardino County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the County, including interest as herein above set forth, subject to foreclosure in event of default in payment.
7. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to hold the County harmless and pay all costs incurred by the County in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.
8. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.
9. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the County at the same time such notice is provided to the successor.
10. Time is of the essence in the performance of this Agreement.
11. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.
12. The Owner its successors and assigns, hereby agrees to save and hold harmless the County, any of its departments, agencies, officers or employees, all of whom while working within their respective authority, from all cost, injury and damage incurred by any of the above, and from any other injury or damage to any person or

property whatsoever, any of which is caused by an activity, condition or event arising out of the performance, preparation for performance or nonperformance of any provision of this agreement by the Owner, its agents, or any of its independent contractors.

IF TO COUNTY :

IF TO OWNER:

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

OWNER:

Name

Title

OWNER:

Name

Title

NOTARIES ON FOLLOWING PAGE

A notary acknowledgement is required for recordation (attach appropriate acknowledgement).

ACCEPTED BY:

Public Works Director

Date: _____

Attachment: Standard Notary Acknowledgement

EXHIBIT A
(Legal Description)

EXHIBIT B
(Map/illustration)

Attachment B Tables

Attachment C Pollutants of Concern

Pollutants of Concern

- **Bacteria and Viruses** – Bacteria and Viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses, can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
- **Metals** – The primary source of metal pollution in stormwater is typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. Metals are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. At low concentrations naturally occurring in soil, metals may not be toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications (OC 2003).
- **Nutrients** – Nutrients are inorganic substances, such as nitrogen and phosphorus. Excessive discharge of nutrients to water bodies and streams causes eutrophication, where aquatic plants and algae growth can 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. Primary sources of nutrients in urban runoff are fertilizers and eroded soils.
- **Pesticides** -- Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Relatively low levels of the active component of pesticides can result in conditions of aquatic toxicity. Excessive or improper application of a pesticide may result in runoff containing toxic levels of its active ingredient (OC 2003).
- **Organic Compounds** – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to 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 (OC 2003).
- **Sediments** – Sediments are solid materials that are eroded from the land surface. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
- **Trash and Debris** – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may

have a significant impact on the recreational value of a water body and aquatic habitat. Trash impacts water quality by increasing biochemical oxygen demand.

- *Oxygen-Demanding Substances* – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions. A reduction of dissolved oxygen is detrimental to aquatic life and can generate hazardous compounds such as hydrogen sulfides.
- *Oil and Grease* – Oil and grease in water bodies decreases the aesthetic value of the water body, as well as the water quality. 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.

Attachment D

Flow- and Volume-Based BMP Design Calculations

INSTRUCTIONS FOR ESTIMATING VOLUME- AND FLOW-BASED BMP DESIGN RUNOFF QUANTITIES⁴

- 1) Identify the “BMP Drainage Area” that drains to the proposed BMP element. This includes all areas that will drain to the proposed BMP element, including pervious areas, impervious areas, and off-site areas, whether or not they are directly or indirectly connected to the BMP element. Calculate the BMP Drainage Area (A) in acres.
- 2) Outline the Drainage Area on the NOAA Atlas 14 Precipitation Depths (2-year 1-hour Rainfall) map (Figure D-1).
- 3) Determine the area-averaged 2-year 1-hour rainfall value for the Drainage Area outlined above.

A. Flow-Based BMP Design

- 1) Calculate the composite runoff coefficient, C_{BMP} , as defined in B.2.

⁴ Rainfall analysis to develop regression coefficients in Table D-1 and modifications to the NOAA Atlas 14 map were conducted by:

Hromadka II, T.V., Professor Emeritus, Department of Mathematics, California State University, Fullerton, and Adjunct Professor, Department of Mathematical Sciences, United States Military Academy, West Point, NY

Laton, W.R., Assistant Professor, Department of Geological Sciences, California State University, Fullerton

Picciuto J.A., Assistant Professor, Department of Mathematical Sciences, United States Military Academy, West Point, NY

With assistance from:

Rene Perez, M.S. Candidate, Department of Geological Sciences, California State University, Fullerton, and

Jim Friel, Ph.D. Professor Emeritus, Department of Mathematics, California State University, Fullerton

Reported as follows:

1. Hromadka II, T.V., Laton, W.R., and Picciuto J.A., 2005. Estimating Runoff Quantities for Flow and Volume-based BMP Design. Final Report to the San Bernardino County Flood Control District.
2. Laton, W.R., Hromadka II, T.V., and Picciuto J.A., 2005. Estimating Runoff Quantities for Flow and Volume-based BMP Design (submitted). Journal of the American Water Resources Association.

- 2) Determine which Region the BMP Drainage Area is located in (Valley, Mountain or Desert).
- 3) Determine BMP design rainfall intensity, I_{BMP} , by multiplying the area-averaged 2-year 1-hour value from the NOAA Atlas 14 map by the appropriate regression coefficient from Table D-1 ("I"), and then multiplying by the safety factor specified in the criteria – usually a factor of 2.
- 4) Calculate the target BMP flow rate, Q , by using the following formula (see Table D-2 below for limitations on the use of this formula):

$$Q = C_{BMP} \cdot I_{BMP} \cdot A$$

where: Q = flow in ft^3/s
 I_{BMP} = BMP design rainfall intensity, in inches/hour
 A = Drainage Area in acres
 C_{BMP} = composite runoff coefficient

Table D-1: Regression Coefficients for Intensity (I) and 6-hour mean storm rainfall (P_6).

Quantity	Valley 85% upper confidence limit	Mountain 85% upper confidence limit	Desert 85% upper confidence limit
I	0.2787	0.3614	0.3250
P₆	1.4807	1.9090	1.2371

Table D-2: Use of the flow-based formula for BMP Design (CASQA 2003).

BMP Drainage Area (Acres)	Composite Runoff Coefficient, "C"			
	0.00 to 0.25	0.26 to 0.50	0.51 to 0.75	0.76 to 1.00
0 to 25	Caution	Yes	Yes	Yes
26 to 50	High Caution	Caution	Yes	Yes
51 to 75	Not Recommended	High Caution	Caution	Yes
76 to 100	Not Recommended	High Caution	Caution	Yes

If the flow-based BMP formula use case, as determined by Table D-2, shows “Caution,” “High Caution,” or “Not Recommended,” considering the project’s characteristics, then the project proponent must calculate the BMP design flow using the unit hydrograph method, as specified in the most current version of the San Bernardino County Hydrology Manual, using the design storm pattern with rainfall return frequency such that the peak one hour rainfall depth equals the 85th-percentile 1-hour rainfall multiplied by two.

B. Volume-Based BMP Design

- 1) Calculate the “Watershed Imperviousness Ratio”, i , which is equal to the percent of impervious area in the BMP Drainage Area divided by 100.
- 2) Calculate the composite runoff coefficient C_{BMP} for the Drainage Area above using the following equation:

$$C_{BMP} = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

where: C_{BMP} = composite runoff coefficient; and,
 i = watershed imperviousness ratio.

- 3) Determine which Region the Drainage Area is located in (Valley, Mountain or Desert).
- 4) Determine the area-averaged “6-hour Mean Storm Rainfall”, P_6 , for the Drainage Area. This is calculated by multiplying the area averaged 2-year 1-hour value by the appropriate regression coefficient from Table 1.
- 5) Determine the appropriate drawdown time. Use the regression constant $a = 1.582$ for 24 hours and $a = 1.963$ for 48 hours. *Note: Regression constants are provided for both 24 hour and 48 hour drawdown times; however, 48 hour drawdown times should be used in most areas of California. Drawdown times in excess of 48 hours should be used with caution as vector breeding can be a problem after water has stood in excess of 72 hours. (Use of the 24 hour drawdown time should be limited to drainage areas with coarse soils that readily settle and to watersheds where warming may be detrimental to downstream fisheries.)*
- 6) Calculate the “Maximized Detention Volume”, P_0 , using the following equation:

$$P_0 = a \cdot C_{BMP} \cdot P_6$$

where: P_0 = Maximized Detention Volume, in inches
 $a = 1.582$ for 24 hour and $a = 1.963$ for 48 hour drawdown,
 C_{BMP} = composite runoff coefficient; and,
 P_6 = 6-hour Mean Storm Rainfall, in inches

7) Calculate the “Target Capture Volume”, V_0 , using the following equation:

$$V_0 = (P_0 \cdot A) / 12$$

where:

V_0 = Target Capture Volume, in acre-feet

P_0 = Maximized Detention Volume, in inches; and,

A = BMP Drainage Area, in acres

**Attachment D
Flow- and Volume-Based BMP Design
Calculations
Figure D-1**

