**City of Escondido**

**PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP**

**[INSERT PROJECT NAME]**

**[INSERT PROJECT ID/GRADING PERMIT NUMBER(S)]**

**[INSERT PROJECT ADDRESS]**

**[INSERT PROJECT CITY, STATE ZIP CODE]**

**ASSESSOR'S PARCEL NUMBER(S):**

**[INSERT APN(S)]**

**ENGINEER OF WORK:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**[INSERT CIVIL ENGINEER'S NAME AND PE NUMBER HERE, PROVIDE WET SIGNATURE AND STAMP ABOVE LINE]**

PREPARED FOR:

[INSERT APPLICANT NAME]

[INSERT ADDRESS]

[INSERT CITY, STATE ZIP CODE]

[INSERT TELEPHONE NUMBER]

PDP SWQMP PREPARED BY:

[INSERT COMPANY NAME]

[INSERT ADDRESS]

[INSERT CITY, STATE ZIP CODE]

[INSERT TELEPHONE NUMBER]

DATE OF SWQMP:

[INSERT MONTH, DAY, YEAR]

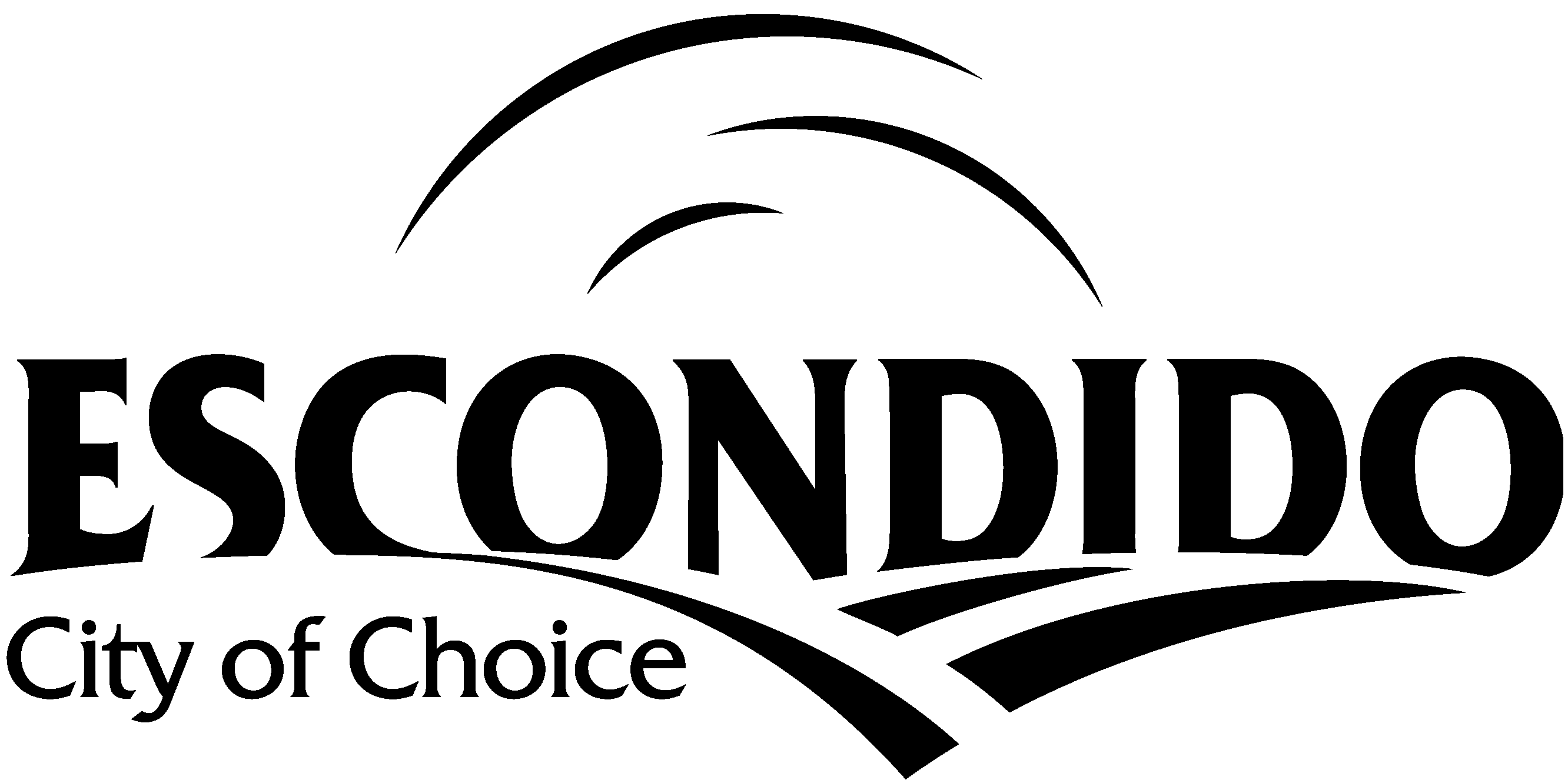
PLANS PREPARED BY: SWQMP APPROVED BY:

[INSERT CIVIL ENGINEER OR ARCHITECT] [FOR CITY STAFF ONLY]

[INSERT ADDRESS]

[INSERT CITY, STATE ZIP CODE]

[INSERT TELEPHONE NUMBER] APPROVAL DATE:



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# **ATTACHMENTS**

Attachment 1: Backup for PDP Pollutant Control BMPs

Attachment 1a: Storm Water Pollutant Control Worksheet Calculations (Applicable worksheets)

Attachment 1b: Form I-8, Categorization of Infiltration Feasibility Condition

Attachment 1c: Form I-9, Factor of Safety and Design Infiltration Rate Worksheet

Attachment 1d: Drainage Management Area (DMA) Exhibit

Attachment 1e: Individual Structural BMP DMA Mapbook

Attachment 2: Backup for PDP Hydromodification Control Measures

Attachment 2a: Flow Control Facility Design

Attachment 2b: Hydromodification Management Exhibit

Attachment 2c: Management of Critical Coarse Sediment Yield Areas

Attachment 2d: Geomorphic Assessment of Receiving Channels (optional)

Attachment 2e: Vector Control Plan (if applicable)

Attachment 3: Structural BMP Maintenance Plan

Attachment 3a: Structural BMP Maintenance Thresholds and Actions

Attachment 3b: Draft Maintenance Agreements / Notifications (when applicable)

Attachment 4: City of Escondido PDP Structural BMP Verification

Attachment 5: Copy of Plan Sheets Showing Permanent Storm Water BMPs

# ACRONYMS

ACP Alternative Compliance Project

APN Assessor's Parcel Number

BMP Best Management Practice

DMA Drainage Management Area

EOW Engineer of Work

HMP Hydromodification Management Plan

HSG Hydrologic Soil Group

MS4 Municipal Separate Storm Sewer System

N/A Not Applicable

PDP Priority Development Project

PE Professional Engineer

SC Source Control

SD Site Design

SDRWQCB San Diego Regional Water Quality Control Board

SIC Standard Industrial Classification

SWDM Storm Water Design Manual

SWQMP Storm Water Quality Management Plan

USGS US Geological Survey

WMAA Watershed Management Area Analysis

WQIP Water Quality Improvement Plan

# PDP SWQMP PREPARER'S CERTIFICATION PAGE

**Project Name: [Insert Project Name]**

**Permit Number: [Insert Project ID/Grading Permit Number(s)]**

**PREPARER'S CERTIFICATION**

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of Escondido Storm Water Design Manual, which is a design manual for compliance with the City of Escondido Municipal Code (Chapter 22, Article 2) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the City of Escondido has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by City staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Engineer of Work's Signature, PE Number & Expiration Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Print Name

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Company

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date

Engineer's Seal:

# SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

|  |  |  |
| --- | --- | --- |
| **Submittal Number** | **Date** | **Summary of Changes** |
| 1 |  | Initial Submittal |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |

Final Design

|  |  |  |
| --- | --- | --- |
| **Submittal Number** | **Date** | **Summary of Changes** |
| 1 |  | Initial Submittal |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |

Plan Changes

|  |  |  |
| --- | --- | --- |
| **Submittal Number** | **Date** | **Summary of Changes** |
| 1 |  | Initial Submittal |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |

# PROJECT VICINITY MAP

**Project Name: [Insert Project Name]**

**Permit Number: [Insert Project ID/Grading Permit Number(s)]**

[Insert Project Vicinity Map here]

# Project type determination

|  |  |  |
| --- | --- | --- |
| **Site Information Checklist for PDPs** | | **Form I-2a** |
| **Project Summary Information** | | |
| Project Name |  | |
| Project Address |  | |
| Assessor's Parcel Number(s) |  | |
| Permit Number | [Insert Project ID/Grading Permit Number(s)] | |
| Project Watershed (Hydrologic Unit) | Select One:   * Carlsbad 904 * San Dieguito 905 | |
| Parcel Area  (total area of Assessor's Parcel(s) associated with the project) | \_\_\_\_\_\_\_\_ Acres (\_\_\_\_\_\_\_\_\_\_\_\_ Square Feet) | |
| Area to be disturbed by the project  (Project Area) | \_\_\_\_\_\_\_\_ Acres (\_\_\_\_\_\_\_\_\_\_\_\_ Square Feet) | |
| Project Proposed Impervious Area  (subset of Project Area) | \_\_\_\_\_\_\_\_ Acres (\_\_\_\_\_\_\_\_\_\_\_\_ Square Feet) | |
| Project Proposed Pervious Area  (subset of Project Area) | \_\_\_\_\_\_\_\_ Acres (\_\_\_\_\_\_\_\_\_\_\_\_ Square Feet) | |
| Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project.  This may be less than the Parcel Area. | | |

## Storm Water Quality Management Plan requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Site Information Checklist for PDPs** | | | **Form I-2a** |
| **Step** | **Answer** | **Progression** | |
| Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions?  To answer this item, complete Step 1 Project Type Determination Checklist on Pages 3 and 4, and see PDP exemption information below.  For further guidance, see Section 1.4 of the Storm Water Design Manual *in its entirety*. | Standard Project | Standard Project requirements apply.  **Complete Form I-1.** | |
| PDP  PDP with ACP | Standard and PDP requirements apply, including PDP SWQMP.  **SWQMP Required.**  If participating in offsite alternative compliance, **complete Step 5.1** (Offsite Alternative Compliance Participation Form) **and an ACP SWQMP.** | |
| PDP Exemption | **Go to Step 1.2 below.** | |

## Exemption to PDP definitions

|  |  |  |
| --- | --- | --- |
| **Site Information Checklist for PDPs** | | **Form I-2a** |
| Is the project exempt from PDP definitions based on either of the following:  Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:   * 1. Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR   2. Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR   3. Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Green Streets Infrastructure; | If so:  Standard Project requirements apply, AND any additional requirements specific to the type of project. City concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.* | |
| Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Green Streets Infrastructure; | **PDP Exempt.** | |
| Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable: | | |
|  | | |

## Confirmation of PDP Determination

| **Site Information Checklist for PDPs** | | | | | **Form I-2a** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| The project is (select one):  New Development  Redevelopment[[1]](#footnote-1) | | | | | | | |
| The total proposed newly created or replaced impervious area is: \_\_\_\_\_\_\_\_\_\_\_\_ ft2 | | | | | | | |
| The project meets the following categories, (a) through (f): [select all that apply] | | | | | | | |
| Yes | No | (a) | New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. | | | | |
| Yes | No | (b) | Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. | | | | |
| Yes | No | (c) | New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:   1. Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812).   *Information and an SIC search function are available at* [*www.osha.gov/pls/imis/sicsearch.html.*](http://www.osha.gov/pls/imis/sicsearch.html.)   1. Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. 2. Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. 3. Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles. | | | | |
| Yes | No | (d) | New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). “Discharging directly to” includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).  *Note: ESAs are 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 Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.*  *For projects adjacent to an ESA, but not discharging to an ESA, the 2,500 square foot threshold does not apply as long as the project does not physically disturb the ESA and the ESA is upstream of the project.* | | | | |
| Yes | No | (e) | New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:   1. Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.   *Information and an SIC search function are available at* [*www.osha.gov/pls/imis/sicsearch.html*](http://www.osha.gov/pls/imis/sicsearch.html)*.*   1. Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. | | | | |
| Yes | No | (f) | New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.    Note: See Storm Water Design Manual Section 1.4.2 for additional guidance. | | | | |
| **The following is for redevelopment PDPs only:** | | | | | | | |
| The area of existing (pre-project) impervious area at the project site is: | | | | A | | \_\_\_\_\_ | ft2 |
| The total proposed newly created or replaced impervious area is: | | | | B | | \_\_\_\_\_ | ft2 |
| Percent impervious surface created or replaced: | | | | (B/A)\*100 | | \_\_\_\_\_ | % |
| The percent impervious surface created or replaced is (select one based on the above calculation):  **less than or equal to fifty percent (50%)** – only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements  OR  **greater than fifty percent (50%)** – the entire project site is considered a PDP and subject to stormwater requirements | | | | | | | |

# City of Escondido PDP SWQMP Site Information Checklist

## Description of Existing Site Condition and Drainage Patterns

|  |  |
| --- | --- |
| **Site Information Checklist for PDPs** | **Form I-2a** |
| Current Status of the Site (select all that apply):  Existing development  Previously graded but not built out  Demolition completed without new construction  Agricultural or other non-impervious use  Vacant, undeveloped/natural  Description / Additional Information: | |
|  | |
| Existing Land Cover Includes (select all that apply and provide each area on site):  Vegetative Cover \_\_\_\_\_\_\_\_ Acres (\_\_\_\_\_\_\_\_\_\_\_\_ Square Feet)  Non-Vegetated Pervious Areas \_\_\_\_\_\_\_\_ Acres (\_\_\_\_\_\_\_\_\_\_\_\_ Square Feet)  Impervious Areas \_\_\_\_\_\_\_\_ Acres (\_\_\_\_\_\_\_\_\_\_\_\_ Square Feet)  Description / Additional Information: | |
|  | |
| Underlying Soil belongs to Hydrologic Soil Group (select all that apply):  NRCS Type A  NRCS Type B  NRCS Type C  NRCS Type D | |
| Approximate Depth to Groundwater (GW) (or N/A for no infiltration BMPs):  Groundwater Depth < 5 feet  5 feet < Groundwater Depth < 10 feet  10 feet < Groundwater Depth < 20 feet  Groundwater Depth > 20 feet | |
| Existing Natural Hydrologic Features (select all that apply):  Watercourses  Seeps  Springs  Wetlands  None  Other  Description / Additional Information: | |
|  | |

## Description of Existing Site Drainage Patterns

|  |  |
| --- | --- |
| **Site Information Checklist for PDPs** | **Form I-2a** |
| How is storm water runoff conveyed from the site? At a minimum, this description should answer (1) whether existing drainage conveyance is natural or urban; (2) describe existing constructed storm water conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe: | |
|  | |

## Description of Proposed Site Development

| **Site Information Checklist for PDPs** | | | | **Form I-2a** |
| --- | --- | --- | --- | --- |
| Project Description / Proposed Land Use and/or Activities: | | | | |
|  | | | | |
| List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): | | | | |
|  | | | | |
| List/describe proposed pervious features of the project (e.g., landscape areas): | | | | |
|  | | | | |
| Does the project include grading and changes to site topography?  Yes  No  Description / Additional Information: | | | | |
|  | | | | |
| **Insert acreage or square feet for the different land cover types in the table below:** | | | | |
| Change in Land Cover Type Summary | | | | |
| Land Cover Type | Existing (acres or ft2) | Proposed (acres or ft2) | Percent Change | |
| Vegetation |  |  |  | |
| Pervious (non-vegetated) |  |  |  | |
| Impervious |  |  |  | |
| *total* |  |  | Sum Existing must equal Sum Proposed | |

## Description of Proposed Site Drainage Patterns

| **Site Information Checklist for PDPs** | **Form I-2a** |
| --- | --- |
| Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?  ☐ Yes  ☐ No  If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.  Describe proposed site drainage patterns: | |
|  | |

## Potential Pollutant Source Areas

| **Site Information Checklist for PDPs** | **Form I-2a** |
| --- | --- |
| Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply).  On-site storm drain inlets  Interior floor drains and elevator shaft sump pumps  Interior parking garages  Need for future indoor & structural pest control  Landscape/Outdoor Pesticide Use  Pools, spas, ponds, decorative fountains, and other water features  Food service  Refuse areas  Industrial processes  Outdoor storage of equipment or materials  Vehicle and Equipment Cleaning  Vehicle/Equipment Repair and Maintenance  Fuel Dispensing Areas  Loading Docks  Fire Sprinkler Test Water  Miscellaneous Drain or Wash Water  Plazas, sidewalks, and parking lots  Large Trash Generating Facilities  Animal Facilities  Nurseries and Garden Centers  Automotive Facilities  Other (provide description)  Description / Additional Information: | |
|  | |

## Identification of Receiving Water and Pollutants of Concern

| **Site Information Checklist for PDPs** | | | | | | **Form I-2a** |
| --- | --- | --- | --- | --- | --- | --- |
| Describe path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable): | | | | | | |
|  | | | | | | |
| List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs for the impaired water bodies: | | | | | | |
| **303(d) Impaired Water Body** | | **Pollutant(s)/Stressor(s)** | | **TMDLs / WQIP Highest Priority Pollutant** | | |
|  | |  | |  | | |
|  | |  | |  | | |
|  | |  | |  | | |
| **Identification of Project Site Pollutants\*** | | | | | | |
| \*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated). | | | | | | |
| Identify pollutants expected from the project site based on all proposed use(s) of the site (see Storm Water Design Manual Appendix B.6): | | | | | | |
| **Pollutant** | **Not Applicable to the Project Site** | | **Anticipated from the Project Site** | | **Also a Receiving Water Pollutant of Concern** | |
| Sediment |  | |  | |  | |
| Nutrients |  | |  | |  | |
| Heavy Metals |  | |  | |  | |
| Organic Compounds |  | |  | |  | |
| Trash & Debris |  | |  | |  | |
| Oxygen Demanding Substances |  | |  | |  | |
| Oil & Grease |  | |  | |  | |
| Bacteria & Viruses |  | |  | |  | |
| Pesticides |  | |  | |  | |

## Hydromodification Management Requirements

| **Site Information Checklist for PDPs** | **Form I-2a** |
| --- | --- |
| Do hydromodification management requirements apply (see Section 1.6 of the Storm Water Design Manual)?  Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.  No, the project will discharge runoff directly to the exempt portion of Escondido Creek as detailed in the Carlsbad Watershed WQIP (May 2018 Update). Direct discharge is defined in section 1.6 of the Escondido Storm Water Design Manual.  No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Refer to HMP Exhibit in Attachment 2.  No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Refer to HMP Exhibit in Attachment 2.  *Note: Direct Discharge refers to an uninterrupted hardened conveyance system. Projects claiming the Direct Discharge exemption must satisfy the applicable criteria (energy dissipation, invert elevation, etc.) included in Section 1.6 of the Escondido Storm Water Design Manual*. | |
| Description / Additional Information (to be provided if a 'No' answer has been selected above): | |
|  | |
| **HMP Exemption Exhibit**  Attach an HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to the HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information, and exempt waterbody.  Reference applicable drawing number(s). | |
|  | |

### Critical Coarse Sediment Yield Areas

|  |  |
| --- | --- |
| **Site Information Checklist for PDPs** | **Form I-2a** |
| **N/A - This Section only required if hydromodification management requirements apply** | |
| Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?  Yes  No, no critical coarse sediment yield areas to be protected based on WMAA maps  If yes, have any of the optional analyses presented in Appendix H of the manual been performed?  H.6.1 Site-Specific GLU Analysis  H.7 Downstream Systems Sensitivity to Coarse Sediment   * + H.7.1 Depositional Analysis,   + H.7.2 Threshold Channel Analysis, or   + H.7.3 Course Sediment Source Area Verification Analysis   No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps  If optional analyses were performed, what is the final result?  No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.  Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 8 of the SWQMP.  Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections H.2, H.3, and H.4 as applicable, and the areas are identified on the SWQMP Exhibit. | |
| Discussion / Additional Information: | |
|  | |

### Flow Control for Post-Project Runoff

| **Site Information Checklist for PDPs** | **Form I-2a** |
| --- | --- |
| **N/A - This Section only required if hydromodification management requirements apply** | |
| List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. | |
|  | |
| Has a geomorphic assessment been performed for the receiving channel(s)?  No, the low flow threshold is 0.1Q2 (default low flow threshold)  Yes, the result is the low flow threshold is 0.1Q2  Yes, the result is the low flow threshold is 0.3Q2  Yes, the result is the low flow threshold is 0.5Q2  If a geomorphic assessment has been performed, provide title, date, and preparer: | |
|  | |
| Discussion / Additional Information: (optional) | |
|  | |
| Select method used to determine low flow threshold:  Sizing Factor Method  US Geological Survey (USGS) Equation  Continuous Simulation Modeling | |

## Other Site Requirements and Constraints

| **Site Information Checklist for PDPs** | **Form I-2a** |
| --- | --- |
| When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements. | |
|  | |
| **Optional Additional Information or Continuation of Previous Sections As Needed** | |
| This space provided for additional information or continuation of information from previous sections as needed. | |
|  | |

# Source Control BMP Checklist

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source Control BMP Checklist for PDPs** | **Form I-2b** | | | |
| All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the City Storm Water Design Manual for information to implement source control BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project.  Answer each category below pursuant to the following:   * "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required. * "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. * "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided. | | | | |
| **Source Control Requirement** | | **Applied?** | | |
| **4.2.1** Prevention of Illicit Discharges into the MS4 | | Yes | No | N/A |
| Discussion / justification if 4.2.1 not implemented: | | | | |
|  | | | | |
| **4.2.2** Storm Drain Stenciling or Signage | | Yes | No | N/A |
| Discussion / justification if 4.2.2 not implemented: | | | | |
|  | | | | |
| **4.2.3** Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | | Yes | No | N/A |
| Discussion / justification if 4.2.3 not implemented: | | | | |
|  | | | | |
| **4.2.4** Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | | Yes | No | N/A |
| Discussion / justification if 4.2.4 not implemented: | | | | |
|  | | | | |
| **4.2.5** Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | | Yes | No | N/A |
| Discussion / justification if 4.2.5 not implemented: | | | | |
|  | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Form I-2b Page 2 of 2** | | | |
| **Source Control Requirement** | **Applied?** | | |
| **4.2.6** Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below): |  |  |  |
| Onsite storm drain inlets | Yes | No | N/A |
| Interior floor drains and elevator shaft sump pumps | Yes | No | N/A |
| Interior parking garages | Yes | No | N/A |
| Need for future indoor & structural pest control | Yes | No | N/A |
| Landscape/outdoor pesticide use | Yes | No | N/A |
| Pools, spas, ponds, decorative fountains, and other water features | Yes | No | N/A |
| Food service | Yes | No | N/A |
| Refuse areas | Yes | No | N/A |
| Industrial processes | Yes | No | N/A |
| Outdoor storage of equipment or materials | Yes | No | N/A |
| Vehicle and equipment cleaning | Yes | No | N/A |
| Vehicle/equipment repair and maintenance | Yes | No | N/A |
| Fuel dispensing areas | Yes | No | N/A |
| Loading docks | Yes | No | N/A |
| Fire sprinkler test water | Yes | No | N/A |
| Miscellaneous drain or wash water | Yes | No | N/A |
| Plazas, sidewalks, and parking lots | Yes | No | N/A |
| Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above. | | | |
|  | | | |

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

# Site Design BMP Checklist

|  |  |  |  |
| --- | --- | --- | --- |
| **Site Design BMP Checklist for PDPs** | **Form I-2c** | | |
| All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.  Answer each category below pursuant to the following.   * "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required. * "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. * "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided. | | | |
| **Site Design Requirement** | **Applied?** | | |
| **4.3.1** Maintain Natural Drainage Pathways and Hydrologic Features | Yes | No | N/A |
| Discussion / justification if 4.3.1 not implemented: | | | |
|  | | | |
| 1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map? | Yes | No | N/A |
| 1-2 Are trees implemented? If yes, are they shown on the site map? | Yes | No | N/A |
| 1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)? | Yes | No | N/A |
| 1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E? | Yes | No | N/A |
| **4.3.2** Conserve Natural Areas, Soils, and Vegetation | Yes | No | N/A |
| Discussion / justification if 4.3.2 not implemented: | | | |
|  | | | |
| **4.3.3** Minimize Impervious Area | Yes | No | N/A |
| Discussion / justification if 4.3.3 not implemented: | | | |
|  | | | |
| **4.3.4** Minimize Soil Compaction | Yes | No | N/A |
| Discussion / justification if 4.3.4 not implemented: | | | |
|  | | | |
| **Form I-2c Page 2 of 2** | | | |
| **Site Design Requirement** | **Applied?** | | |
| **4.3.5** Impervious Area Dispersion | Yes | No | N/A |
| Discussion / justification if 4.3.5 not implemented: | | | |
|  | | | |
| 5-1 Is the pervious area receiving runon from impervious area identified on the site map? | Yes | No | N/A |
| 5-2 Does the pervious area satisfy the design criteria in 4.3.5. Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.) | Yes | No | N/A |
| 5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E? | Yes | No | N/A |
| **4.3.6** Runoff Collection | Yes | No | N/A |
| Discussion / justification if 4.3.6 not implemented: | | | |
|  | | | |
| 6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map? | Yes | No | N/A |
| 6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E? | Yes | No | N/A |
| 6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map? | Yes | No | N/A |
| 6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E? | Yes | No | N/A |
| **4.3.7** Landscaping with Native or Drought Tolerant Species | Yes | No | N/A |
| Discussion / justification if 4.3.7 not implemented: | | | |
|  | | | |
| **4.3.8** Harvesting and Using Precipitation | Yes | No | N/A |
| Discussion / justification if 4.3.8 not implemented: | | | |
|  | | | |
| 8-1 Are rain barrels implemented in accordance with design  criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map? | Yes | No | N/A |
| 8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E? | Yes | No | N/A |

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

# Summary of Structural BMPs

|  |  |
| --- | --- |
| **Summary of Structural BMPs** | **Form I-3** |
| **PDP Structural BMPs** | |
| All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).  PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative to certify construction of the structural BMPs (see Section 1.12 of the manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the manual).  Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP). | |
| **Description of Structural BMP Strategy**  Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. | |
| (Continue on page 2 as necessary.) | |

|  |
| --- |
| **Form I-3 Page 2 of 3** |
| **(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)** |
| (Continued from page 1) |

|  |  |
| --- | --- |
| **Form I-3 Page 3 of 3** | |
| **Structural BMP Summary Information**  **(Copy this page as needed to provide information for each individual proposed structural BMP)** | |
| Structural BMP ID No. | |
| Construction Plan Sheet No. | |
| Type of structural BMP:  Retention by harvest and use (HU-1)  Retention by infiltration basin (INF-1)  Retention by bioretention (INF-2)  Retention by permeable pavement (INF-3)  Retention by dry wells (INF-4)  Partial retention by biofiltration with partial retention (PR-1)  Biofiltration (BF-1)  Biofiltration with Nutrient Sensitive Media Design (BF-2)  Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F  Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)  Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)  Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)  Detention pond or vault for hydromodification management  Other (describe in discussion section below) | |
| Purpose:  Pollutant control only  Hydromodification control only  Combined pollutant control and hydromodification control  Pre-treatment/forebay for another structural BMP  Other (describe in discussion section below) | |
| Who will certify construction of this BMP?  Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual) |  |
| Who will be the final owner of this BMP? | HOA Property Owner City  Other (describe) |
| Who will maintain this BMP into perpetuity? | HOA Property Owner City  Other (describe) |
| Discussion (as needed): | |
|  | |

## Offsite Alternative Compliance Participation Form

|  |  |
| --- | --- |
| **THIS FORM IS NOT APPLICABLE AT THIS TIME: An Alternative Compliance Program is under consideration by the City of Escondido.** | |
| **PDP INFORMATION** | |
| Record ID: |  |
| Assessor's Parcel Number(s) [APN(s)] |  |
| What are your PDP Pollutant Control Debits?  \*See Attachment 1 of the PDP SWQMP |  |
| What are your PDP HMP Debits? (if applicable)  \*See Attachment 2 of the PDP SWQMP |  |
| **ACP Information** | |
| Record ID: |  |
| Assessor's Parcel Number(s) [APN(s)] |  |
| Project Owner/Address |  |
| What are your ACP Pollutant Control Credits?  \*See Attachment 1 of the ACP SWQMP |  |
| What are your ACP HMP Debits? (if applicable)  \*See Attachment 2 of the ACP SWQMP |  |
|  | |
| Is your ACP in the same watershed as your PDP?  Yes  No | Will your ACP project be completed prior to the completion of the PDP?  Yes  No |
| Does your ACP account for all Deficits generated by the PDP?  Yes  No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.) | What is the difference between your PDP debits and ACP Credits?  \*(ACP Credits -Total PDP Debits = Total Earned Credits)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

# ATTACHMENT 1

## BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

**Indicate which Items are Included behind this cover sheet:**

|  |  |  |
| --- | --- | --- |
| **Attachment Sequence** | **Contents** | **Checklist** |
| Attachment 1a | Storm Water Pollutant Control Worksheet Calculations  -Worksheet B.1-DMA Summary (Optional)  -Worksheet B.2-1- DCV (Required)  -Worksheet B.3-1- H&U Checklist (Required)  -Worksheet B.4-1-Simple Sizing Inf. (if applicable)  -Worksheet B.5-1-Biofilt. Sizing (Pollutant)(if applicable)  -Worksheet B.5-2-Biofilt. Sizing (Volume) (if applicable)  -Worksheet B.5-3-Biofilt. Volume Ret. (if applicable)  -Worksheet B.5-4-Biofilt. Alt. Min. Footprint(if applicable)  -Worksheet B.5-5-Biofilt. w/Upstream Stor. (if applicable)  -Worksheet B.5-6-Biofilt. Ret. No Inf. (if applicable)  -Worksheet B.5-7-Vol. Ret. Amended Soils (if applicable)  -Worksheet B.6-1-Flow-Thru Design Flow (if applicable)  -Form I-10-Compact Biofilt. Checklist (if applicable)  -Summary Worksheet (optional) | Worksheet B.1 (Optional)  Worksheet B.2-1 (Required)  Worksheet B.3-1 (Required)  Worksheet B.4-1 (if applicable)  Worksheet B.5-1 (if applicable)  Worksheet B.5-2 (if applicable)  Worksheet B.5-3 (if applicable)  Worksheet B.5-4 (if applicable)  Worksheet B.5-5 (if applicable)  Worksheet B.5-6 (if applicable)  Worksheet B.5-7 (if applicable)  Worksheet B.6-1 (if applicable)  Form I-10 (if applicable)  Summary Worksheet (optional) |
| Attachment 1b | -Worksheet C.4-1 (Form I-8A), Categorization of Infiltration Feasibility Condition Based on Geotechnical Conditions  -Worksheet C.4-2 (Form I-8B), Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions  (Required unless the project will use harvest and use BMPs, or an Infiltration Feasibility Condition Letter is submitted)  Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-8. | Included  Not included because the entire project will use harvest and use BMPs  Not included because an Infiltration Feasibility Condition Letter is submitted |
| Attachment 1c | Form I-9, Factor of Safety and Design Infiltration Rate Worksheet (Required unless the project will use harvest and use BMPs, or an Infiltration Feasibility Condition Letter is submitted)  Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-9. | Included  Not included because the entire project will use harvest and use BMPs  Not included because an Infiltration Feasibility Condition Letter is submitted |
| Attachment 1d | DMA Exhibit (Required)  See DMA Exhibit Checklist on the back of this Attachment cover sheet. | Included |
| Attachment 1e | Individual Structural BMP DMA Mapbook (Required)  -Place each map on 8.5”x11” paper.  -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA. | Included |

**Use this checklist to ensure the required information has been included on the DMA Exhibit:**

The DMA Exhibit must identify:

Proposed design features and surface treatments used to minimize imperviousness

Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)

Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)

Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

Flow direction arrows

Site Design BMPs used for volume reduction credits

Existing and proposed site drainage network and connections to drainage offsite

Trash Enclosure(s), if available

Roof downspouts

Additionally, it is generally best practice (and the City may require) that these additional features listed below be included on the DMA Exhibit:

Approximate depth to groundwater

Existing natural hydrologic features (watercourses, seeps, springs, wetlands)

Critical coarse sediment yield areas to be protected

Existing topography and impervious areas

Proposed grading

Proposed impervious features

Worksheet B.2‑1. BMP Design Capture Volume

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Design Capture Volume** | | **Worksheet B-2.1** | | |
| 1 | 85th percentile 24-hr storm depth from Figure B.1-1 | d= |  | inches |
| 2 | Area tributary to BMP (s) | A= |  | acres |
| 3 | Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1) | C= |  | unitless |
| 4 | Tree well volume reduction | TCV= |  | cubic-feet |
| 5 | Rain barrels volume reduction | RCV= |  | cubic-feet |
| 6 | Calculate DCV =  (3630 x C x d x A) – TCV - RCV | DCV= |  | cubic-feet |

Worksheet B.3-1. Harvest and Use Feasibility Checklist (Form I-7)

|  |  |  |  |
| --- | --- | --- | --- |
| **Harvest and Use Feasibility Checklist** | | **Worsksheet B.3-1** | |
| 1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?  Toilet and urinal flushing  Landscape irrigation  Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| 2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.  [Provide a summary of calculations here] | | | |
| 3. Calculate the DCV using worksheet B-2.1.  [Provide a results here] | | | |
| 3a. Is the 36-hour demand greater than or equal to the DCV?  Yes / No | 3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?  Yes / No | | 3c. Is the 36-hour demand less than 0.25DCV?  Yes |
| Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria. | Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours. | | Harvest and use is considered to be infeasible. |

Note: 36-hour demand calculations are for feasibility analysis only. Once feasibility analysis is complete the applicant may be allowed to use a different drawdown time provided they meet the 80% annual capture standard (refer to B.4.2) and 96-hour vector control drawdown requirement.

Worksheet B.4-1: Simple Sizing Method for Infiltration BMPs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Simple Sizing Method for Infiltration BMPs** | | **Worksheet B.4-1** | | |
| 1 | DCV (Worksheet B-2.1) | DCV= |  | cubic-feet |
| 2 | Estimated design infiltration rate | Kdesign= |  | in/hr |
| 3 | Available BMP surface area | ABMP= |  | sq-ft |
| 4 | Average effective depth in the BMP footprint (DCV/ABMP) | Davg= |  | feet |
| 5 | Drawdown time, T (Davg \*12/Kdesign) | T= |  | hours |
| 6 | Provide alternative calculation of drawdown time, if needed. | | | |
| 7 | Provide calculations for effective depth provided in the BMP:  Effective Depth = Surface ponding (below the overflow elevation) + gravel storage thickness x gravel porosity (0.4) | | | |

Worksheet B.5-1: Sizing Method for Pollutant Removal Criteria

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sizing Method for Pollutant Removal Criteria** | | | **Worksheet B.5-1** | |
| 1 | Area draining to the BMP |  | | sq. ft. |
| 2 | Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2) |  | |  |
| 3 | 85th percentile 24-hour rainfall depth |  | | inches |
| 4 | Design capture volume [Line 1 x Line 2 x (Line 3/12)] |  | | cu. ft. |
| **BMP Parameters** | | | | |
| 5 | Surface ponding [6 inch minimum, 12 inch maximum] |  | | inches |
| 6 | Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations |  | | inches |
| 7 | Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area |  | | inches |
| 8 | Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area |  | | inches |
| 9 | Freely drained pore storage of the media | 0.2 | | in/in |
| 10 | Porosity of aggregate storage | 0.4 | | in/in |
| 11 | Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.) |  | | in/hr. |
| **Baseline Calculations** | | | | |
| 12 | Allowable routing time for sizing | 6 | | hours |
| 13 | Depth filtered during storm [ Line 11 x Line 12] |  | | inches |
| 14 | Depth of Detention Storage  [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)] |  | | inches |
| 15 | Total Depth Treated [Line 13 + Line 14] |  | | inches |
| **Option 1 – Biofilter 1.5 times the DCV** | | | | |
| 16 | Required biofiltered volume [1.5 x Line 4] |  | | cu. ft. |
| 17 | Required Footprint [Line 16/ Line 15] x 12 |  | | sq. ft. |
| **Option 2 - Store 0.75 of remaining DCV in pores and ponding** | | | | |
| 18 | Required Storage (surface + pores) Volume [0.75 x Line 4] |  | | cu. ft. |
| 19 | Required Footprint [Line 18/ Line 14] x 12 |  | | sq. ft. |
| **Footprint of the BMP** | | | | |
| 20 | BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4) |  | |  |
| 21 | Minimum BMP Footprint [Line 1 x Line 2 x Line 20] |  | | sq. ft. |
| 22 | Footprint of the BMP = Maximum (Minimum (Line 17, Line 19), Line 21) |  | | sq. ft. |
| 23 | Provided BMP Footprint |  | | sq. ft. |
| 24 | Is Line 23 ≥ Line 22?  If Yes, then footprint criterion is met.  If No, increase the footprint of the BMP. | Yes  No | | |

Worksheet B.5-2: Sizing Method for Volume Retention Criteria

|  |  |  |  |
| --- | --- | --- | --- |
| **Sizing Method for Volume Retention Criteria** | | **Worksheet B.5-2** | |
| 1 | Area draining to the BMP |  | sq. ft. |
| 2 | Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2) |  |  |
| 3 | 85th percentile 24-hour rainfall depth |  | inches |
| 4 | Design capture volume [Line 1 x Line 2 x (Line 3/12)] |  | cu. ft. |
| **Volume Retention Requirement** | | | |
| 5 | Measured infiltration rate in the DMA  Note:  When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30  When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05 |  | in/hr. |
| 6 | Factor of safety | 2 |  |
| 7 | Reliable infiltration rate, for biofiltration BMP sizing [Line 5/ Line 6] |  | in/hr. |
| 8 | Average annual volume reduction target (Figure B.5-2)  When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62)  When Line 7 ≤ 0.01 in/hr. = 3.5% |  | % |
| 9 | Fraction of DCV to be retained (Figure B.5-3)  When Line 8 > 8% =  0.0000013 x Line 83 - 0.000057 x Line 82 + 0.0086 x Line 8 - 0.014  When Line 8 ≤ 8% = 0.023 |  |  |
| 10 | Target volume retention [Line 9 x Line 4] |  | cu. ft. |

Worksheet B.5-3: Volume Retention from Biofiltration with Partial Retention BMPs

| **Volume Retention from Biofiltration with Partial Retention BMPs** | | **Worksheet B.5-3** | |
| --- | --- | --- | --- |
| 1 | Area draining to the BMP |  | sq. ft. |
| 2 | Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2) |  |  |
| 3 | 85th percentile 24-hour rainfall depth |  | inches |
| 4 | Design capture volume [Line 1 x Line 2 x (Line 3/12)] |  | cu. ft. |
| **BMP Parameters** | | | |
| 5 | Footprint of the BMP |  | sq. ft. |
| 6 | Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations |  | inches |
| 7 | Media retained pore space [50% of (Field Capacity-Wilting Point)] | 0.05 | in/in |
| 8 | Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area |  | inches |
| 9 | Porosity of aggregate storage | 0.4 | in/in |
| 10 | Measured infiltration rate in the DMA  Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 |  | in/hr. |
| 11 | Factor of safety | 2 |  |
| 12 | Reliable infiltration rate, for biofiltration BMP sizing [Line 10/ Line 11] |  | in/hr. |
| **Evapotranspiration: Average Annual Volume Retention** | | | |
| 13 | Effective evapotranspiration depth [Line 6 x Line 7] |  | inches |
| 14 | Retained pore volume [(Line 13 x Line 5)/12] |  | cu. ft. |
| 15 | Fraction of DCV retained in pore spaces [Line 14/Line 4] |  |  |
| 16 | Evapotranspiration average annual capture [use ET Nomographs in Figure B.5-5, Refer to Appendix B.5.4] |  | % |
| **Infiltration: Average Annual Volume Retention** | | | |
| 17 | Drawdown for infiltration storage [(Line 8 x Line 9)/Line 12] |  | hours |
| 18 | Equivalent DCV fraction from evapotranspiration  (use Line 16 and Line 17 in Figure B.4-1; Refer to Appendix B.4.2.2) |  |  |
| 19 | Infiltration volume storage [(Line 5 x Line 8 x Line 9)/12] |  | cu. ft. |
| 20 | Infiltration storage: Fraction of DCV [Line 19 /Line 4] |  |  |
| 21 | Total Equivalent Fraction of DCV [Line 18 + Line 20] |  |  |
| 22 | Biofiltration BMP average annual capture  [use Line 21 and 17 in Figure B.4-1] |  | % |
| 23 | Fraction of DCV retained (Figure B.5-3)  0.0000013 x Line 223 - 0.000057 x Line 222 + 0.0086 x Line 22- 0.014 |  |  |
| 24 | Volume retention achieved by biofiltration BMP  [Line 23 x Line 4] |  | cu. ft. |

Worksheet B.5-4: Calculation of Alternative Minimum Footprint Sizing Factor for Non-Standard Biofiltration

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Alternative Minimum Footprint Sizing Factor for Non-Standard Biofiltration** | | | | **Worksheet B.5-4** | | |
| 1 | Area draining to the BMP | | | |  | sq. ft. |
| 2 | Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2) | | | |  |  |
| 3 | Load to Clog (default value when using Appendix E fact sheets is 2.0) | | | |  | lb/sq. ft. |
| 4 | Allowable Period to Accumulate Clogging Load (TL) (default value is 10) | | | |  | years |
| **Volume Weighted EMC Calculation** | | | | | | |
| **Land Use** | | **Fraction of Total DCV** | **TSS EMC (mg/L)** | | **Product** | |
| Single Family Residential | |  | 123 | |  | |
| Commercial | |  | 128 | |  | |
| Industrial | |  | 125 | |  | |
| Education (Municipal) | |  | 132 | |  | |
| Transportation | |  | 78 | |  | |
| Multi-family Residential | |  | 40 | |  | |
| Roof Runoff | |  | 14 | |  | |
| Low Traffic Areas | |  | 50 | |  | |
| Open Space | |  | 216 | |  | |
| Other, specify: | |  |  | |  | |
| Other, specify: | |  |  | |  | |
| Other, specify: | |  |  | |  | |
| 5 | Volume Weighted EMC (sum of all products) | | | |  | mg/L |
| **Sizing Factor for Clogging** | | | | | | |
| 6 | Adjustment for pretreatment measures  Where: Line 6 = 0 if no pretreatment; Line 6 = 0.25 when pretreatment is included; Line 6 = 0.5 if the pretreatment has an active Washington State TAPE approval rating for “pre-treatment.” | | | |  |  |
| 7 | Average Annual Precipitation [Provide documentation of the data source in the discussion box; SanGIS has a GIS layer for average annual precipitation] | | | |  | inches |
| 8 | Calculate the Average Annual Runoff (Line 7/12) x Line 1 x Line2 | | | | 1 | cu-ft/yr |
| 9 | Calculate the Average Annual TSS Load  (Line 8 x 62.4 x Line 5 x (1 – Line 6))/106 | | | |  | lb/yr |
| 10 | Calculate the BMP Footprint Needed (Line 9 x Line 4)/Line 3 | | | |  | sq. ft. |
| 11 | Calculate the Minimum Footprint Sizing Factor for Clogging  [ Line 10/ (Line 1 x Line 2)] | | | |  |  |
| Discussion: | | | | | | |

Worksheet B.5-5: Optimized Biofiltration BMP Footprint when Downstream of a Storage Unit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Optimized Biofiltration BMP Footprint when**  **Downstream of a Storage Unit** | | **Worksheet B.5-5** | | |
| 1 | Area draining to the storage unit and biofiltration BMP | |  | sq. ft. |
| 2 | Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2) | |  |  |
| 3 | Effective impervious area draining to the storage unit and biofiltration BMP [Line 1 x Line 2] | |  | sq. ft. |
| 4 | Remaining DCV after implementing retention BMPs | |  | cu. ft. |
| 5 | Design infiltration rate (measured infiltration rate / 2) | |  | ft./hr. |
| 6 | Media Thickness [1.5 feet minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations | |  | ft. |
| 7 | Media filtration rate to be used for sizing (0.42 ft/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate) | |  | ft./hr. |
| 8 | Media retained pore space | | 0.05 | in./in. |
| **Storage Unit Requirement** | | | | |
| 9 | Drawdown time of the storage unit, minimum (from the elevation that bypasses the biofiltration BMP, overflow elevation) | |  | hours |
| 10 | Storage required to achieve greater than 92 percent capture (see Table B.5-5) | |  | fraction |
| 11 | Storage required in cubic feet (Line 4 x Line 10) | |  | cu. ft. |
| 12 | Storage provided in the design, minimum (from the elevation that bypasses the biofiltration BMP, overflow elevation) | |  | cu. ft. |
| 13 | Is Line 12 ≥ Line 11. If no increase storage provided until this criteria is met | | Yes  No | |
| **Criteria 1: BMP Footprint Biofiltration Capacity** | | | | |
| 14 | Peak flow from the storage unit to the biofiltration BMP (using the elevation used to evaluate the percent capture) | |  | cfs |
| 15 | Required biofiltration footprint [(3,600 x Line 14)/Line 7] | |  | sq. ft. |
| **Criteria 2: Alternative Minimum Sizing Factor (Clogging)** | | | | |
| 16 | Alternative Minimum Footprint Sizing Factor [Line 11 of Worksheet B.5-4] | |  | Fraction |
| 17 | Required biofiltration footprint [Line 3 x Line 16] | |  | sq. ft. |
| **Criteria 3: Retention requirement [Not applicable for No Infiltration Condition]** | | | | |
| 18 | Retention Target (Line 10 in Worksheet B.5-2) | |  | cu. ft. |
| 19 | Average discharge rate from the storage unit to the biofiltration BMP | |  | cfs |
| 20 | Depth retained in the optimized biofiltration BMP  {Line 6 x Line 8} + {[(Line 4)/(2400 x Line 19)] x Line 5} | |  | ft. |
| 21 | Required optimized biofiltration footprint (Line 18/Line 20) | |  | sq. ft. |
| **Optimized Biofiltration Footprint** | | | | |
| 22 | Optimized biofiltration footprint, maximum (Line 15, Line 17, Line 21) | |  | sq. ft. |

Worksheet B.5-6: Volume Retention for No Infiltration Condition

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Volume Retention for No Infiltration Condition** | | | | | **Worksheet B.5-6** | | | | | |
| 1 | Area draining to the biofiltration BMP | | | | | | |  | | sq. ft. |
| 2 | Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2) | | | | | | |  | |  |
| 3 | Effective impervious area draining to the BMP [Line 1 x Line 2] | | | | | | |  | | sq. ft. |
| 4 | Required area for Evapotranspiration [Line 3 x 0.03] | | | | | | |  | | sq. ft. |
| 5 | Biofiltration BMP Footprint | | | | | | |  | | sq. ft. |
| **Landscape Area (must be identified on DS-3247)** | | | | | | | | | | |
|  | **Identification** | | **A** | **B** | | **C** | | | **D** | **E** |
| 6 | Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.) | |  |  | |  | | |  |  |
| 7 | Impervious area draining to the landscape area (sq. ft.) | |  |  | |  | | |  |  |
| 8 | Impervious to Pervious Area ratio  [Line 7/Line 6] | |  |  | |  | | |  |  |
| 9 | Effective Credit Area  If Line 8 >1.5, use Line 6; if not use Line 7/1.5 | |  |  | |  | | |  |  |
| 10 | Sum of Landscape area [sum of Lines 9A-9E] | | | | | |  | | | sq. ft. |
| 11 | Provided footprint for evapotranspiration [Line 5 + Line 10] | | | | | |  | | | sq. ft. |
| **Volume Retention Performance Standard** | | | | | | | | | | |
| 12 | Is Line 11 ≥ Line 4?  If yes, then volume retention performance standard for no infiltration condition is met. If no, proceed to Line 13 | | | | | | | Yes  No | | |
| 13 | Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4] | | | | | | |  | |  |
| 14 | Target Volume Retention [Line 10 from Worksheet B.5.2] | | | | | | |  | | cu. ft. |
| 15 | Volume retention required from other site design BMPs  [(1-Line 13) x Line 14] | | | | | | |  | | cu. ft. |
| **Site Design BMP** | | | | | | | | | | |
|  | **Identification** | **Site Design Type** | | | | | | **Credit** | |  |
| 16 | **A** |  | | | | | |  | | cu. ft. |
| **B** |  | | | | | |  | | cu. ft. |
| **C** |  | | | | | |  | | cu. ft. |
| **D** |  | | | | | |  | | cu. ft. |
| **E** |  | | | | | |  | | cu. ft. |
| Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Lines 16A-16E]  Provide documentation of how the site design credit is calculated in the PDP SWQMP. | | | | | | |  | | cu. ft. |
| 17 | Is Line 16 ≥ Line 15?  If yes, then volume retention performance standard for no infiltration condition is met. If no, implement additional site design BMPs. | | | | | | | Yes  No | | |

Worksheet B.5-7: Volume Retention from Amended Soils

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Volume Retention From Amended Soils** | | **Worksheet B.5-7** | | |
| 1 | Impervious area draining to the pervious area | |  | sq. ft. |
| 2 | Pervious area (must meet the requirements in SD-B and SD-F Fact Sheets) | |  | sq. ft. |
| 3 | Dispersion Ratio [Line 1/Line 2]  Note: This worksheet is not applicable when Line 3 > 50 or Line 3 < 0.25 | |  |  |
| 4 | Adjusted runoff factor [(Line 1 \* 0.9 + Line 2 \* 0.1) / (Line 1 + Line 2)] | |  |  |
| 5 | 85th percentile 24-hour rainfall depth | |  | inches |
| 6 | Design capture volume [(Line 1 + Line 2) x Line 4 x (Line 5/12)] | |  | cu. ft. |
| 7 | Amendment Depth (Choose from 3”, 6”, 9”, 12”, 15” and 18”) | |  | inches |
| 8 | Storage [(porosity – field capacity) + 0.5 \* (field capacity – wilting point)] | | 0.25 | in./in. |
| 9 | Pervious Storage [Line 2 \* (Line 7/12) \* Line 8] | |  | cu. ft. |
| 10 | Fraction of DCV [Line 9 / Line 6] | |  |  |
| 11 | Measured Infiltration Rate  When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30  When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05 | |  | in/hr. |
| 12 | Factor of Safety | | 2 |  |
| 13 | Reliable Infiltration Rate [Line 11/Line 12] | |  | in/hr. |
| 14 | Dispersion Credit (Based on Figures B.5.6 to B.5.11; Line 10 and Line 13) | |  |  |
| 15 | Volume retention due to amendment [Line 1 \* (Line 5/12) \* Line 14] | |  | cu. ft. |

Worksheet B.6-1: Flow-Thru Design Flows

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Flow-thru Design Flows** | | **Worksheet B.6-1** | | |
| 1 | DCV | DCV |  | cubic-feet |
| 2 | DCV retained | DCVretained |  | cubic-feet |
| 3 | DCV biofiltered | DCVbiofiltered |  | cubic-feet |
| 4 | DCV requiring flow-thru  (Line 1 – Line 2 – 0.67\*Line 3) | DCVflow-thru |  | cubic-feet |
| 5 | Adjustment factor (Line 4 / Line 1)\* | AF= |  | unitless |
| 6 | Design rainfall intensity | i= | 0.20 | in/hr |
| 7 | Area tributary to BMP (s) | A= |  | acres |
| 8 | Area-weighted runoff factor (estimate using Appendix B.2) | C= |  | unitless |
| 9 | Calculate Flow Rate = AF x (C x i x A) | Q= |  | cfs |
| *10* | ***For Proprietary Biofiltration Only:*** *QBio=1.5 x Q* | *QBio=* |  | *cfs* |

**Form I-10: Compact (high rate) Biofiltration BMP Checklist**

| **Compact (high rate) Biofiltration BMP Checklist** | | | | **Form I-10** |
| --- | --- | --- | --- | --- |
| Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.  A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in  some cases. This depends on the characteristics of the DMA and the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.  An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant’s determination, Section 2 of this form will be completed by the City and returned to the applicant. | | | | |
| **Section 1: Biofiltration Criteria Checklist (Appendix F)** | | | | |
| Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F. | | | | |
| **Criteria** | **Answer** | | **Progression** | |
| **Criteria 1 and 3**:  What is the infiltration condition of the DMA?  Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.  Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination:   * Infiltration Feasibility Condition Letter; or * Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I- 8B.   Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal |  | Full Infiltration Condition | **Stop**. Compact biofiltration BMP is not allowed. | |
|  | Partial Infiltration Condition | Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5- 2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction).  If the required volume reduction is achieved  **proceed to Criteria 2**.  If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. **Stop**. | |
|  | No Infiltration Condition | Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP.  If the criteria in Table B.5-1 is met **proceed to Criteria 2**.  If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. **Stop**. | |
| **Provide basis for Criteria 1 and 3:** | | | | |
|  | | | | |
| **Feasibility Analysis:**  Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal. | | | | |
|  | | | | |
| **If Partial Infiltration Condition:**  Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas. | | | | |
|  | | | | |
| **If No Infiltration Condition:**  Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met. | | | | |
|  | | | | |
| **Criteria** | **Answer** | | **Progression** | |
| **Criteria 2:**  Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit?  Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. |  | Meets Flow Based Criteria | Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP.  Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.)  **Proceed to Criteria 4.** | |
|  | Meets Volume Based Criteria | Provide documentation that the compact biofiltration BMP has a total static (i.e. non- routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite.  **Proceed to Criteria 4.** | |
|  | Does not Meet either | **Stop**. Compact biofiltration BMP is not allowed. | |
| **Provide basis for Criteria 2:**  Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable). | | | | |
|  | | | | |
| **Criteria** | **Answer** | | **Progression** | |
| **Criteria 4:**  Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern?  Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. |  | Yes, meets the TAPE certification. | Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern.  **Proceed to Criteria 5.** | |
|  | Yes, through other third-party documentation. | Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2.  **Proceed to Criteria 5.** | |
|  | No | **Stop**. Compact biofiltration BMP is not allowed. | |
| **Provide basis for Criteria 4:**  Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern. | | | | |
|  | | | | |
| **Criteria** | **Answer** | | **Progression** | |
| **Criteria 5:**  Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process?  Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. |  | Yes | Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance.  **Proceed to Criteria 6.** | |
|  | No | **Stop**. Compact biofiltration BMP is not allowed. | |
| **Provide basis for Criteria 5:**  Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process. | | | | |
|  | | | | |
| **Criteria** | **Answer** | | **Progression** | |
| **Criteria 6:**  Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP? |  | Yes | Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification.  **Proceed to Criteria 7.** | |
|  | No | **Stop**. Compact biofiltration BMP is not allowed. | |
| **Provide basis for Criteria 6:**  Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable). | | | | |
|  | | | | |
| **Criteria** | **Answer** | | **Progression** | |
| **Criteria 7:**  Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)? |  | Yes, and the compact BMP is privately owned, operated and not in the public right of way. | Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.  **Stop**. The compact biofiltration BMP meets the required criteria. | |
|  | Yes, and the BMP is either owned or operated by the City or in the public right of way. | Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination.  **Stop**. Consult the City Engineer for a determination. | |
|  | No | **Stop**. Compact biofiltration BMP is not allowed. | |
| **Provide basis for Criteria 7:**  Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. | | | | |
|  | | | | |
| **Section 1: Biofiltration Criteria Checklist (Appendix F)** | | | | |
| Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA? | | | Yes  No, See explanation below | |
| Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance: | | | | |
|  | | | | |

Worksheet C.4‑12 (Form I-8A): Categorization of Infiltration Feasibility Condition Based on Geotechnical Conditions[[2]](#footnote-2)

| **Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions** | | **Worksheet C.4-1: Form I-8A[[3]](#footnote-3)** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Part 1 - Full Infiltration Feasibility Screening Criteria** | | | | | | | | |
| **DMA(s) Being Analyzed:** | | **Project Phase:** | | | | | | |
|  | |  | | | | | | |
| **Criteria 1: Infiltration Rate Screening** | | | | | | | | |
| 1A | Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[[4]](#footnote-4)?  ☐ Yes; the DMA may feasibly support full infiltration. Answer “Yes” to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing.  ☐ No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B).  ☐ No; the mapped soil types are C, D, or “urban/unclassified” and is corroborated by available site soil data. Answer “No” to Criteria 1 Result.  ☐ No; the mapped soil types are C, D, or “urban/unclassified” but is not corroborated by available site soil data (continue to Step 1B). | | | | | | | |
| 1B | Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1?  ☐ Yes; Continue to Step 1C.  ☐ No; Skip to Step 1D. | | | | | | | |
| 1C | Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour?  ☐ Yes; the DMA may feasibly support full infiltration. Answer “Yes” to Criteria 1 Result.  ☐ No; full infiltration is not required. Answer “No” to Criteria 1 Result. | | | | | | | |
| 1D | **Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation.  ☐ ☐ Yes; continue to Step 1E.  ☐ No; select an appropriate infiltration testing method. | | | | | | | |
| 1E | **Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2?  ☐ ☐ Yes; continue to Step 1F.  ☐ No; conduct appropriate number of tests. | | | | | | | |
| IF | **Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9).  ☐ ☐ Yes; continue to Step 1G.  ☐ No; select appropriate factor of safety. | | | | | | | |
| 1G | **Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour?  ☐ ☐ Yes; answer “Yes” to Criteria 1 Result.  ☐ No; answer “No” to Criteria 1 Result. | | | | | | | |
| Criteria 1 Result | Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP?  ☐ Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2.  ☐ No; full infiltration is not required. Skip to Part 1 Result. | | | | | | | |
| Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report. | | | | | | | | |
|  | | | | | | | | |
| **Criteria 2: Geologic/Geotechnical Screening** | | | | | | | | |
| 2A | If all questions in Step 2A are answered “Yes,” continue to Step 2B.  For any “No” answer in Step 2A answer “No” to Criteria 2, and submit an “Infiltration Feasibility Condition Letter” that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP. | | | | | | | |
| 2A-1 | Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface? | | | | ☐ Yes | | ☐ No | |
| 2A-2 | Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls? | | | | ☐ Yes | | ☐ No | |
| 2A-3 | Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope? | | | | ☐ Yes | | ☐ No | |
| 2B | When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1.  If all questions in Step 2B are answered “Yes,” then answer “Yes” to Criteria 2 Result.  If there are “No” answers continue to Step 2C. | | | | | | | |
| 2B-1 | **Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP.  Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks? | | | | ☐ Yes | | ☐ No | |
| 2B-2 | **Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs.  Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks? | | | | ☐ Yes | | ☐ No | |
| 2B-3 | **Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities.  Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks? | | | | ☐ Yes | | ☐ No | |
| 2B-4 | **Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required.  Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks? | | | | ☐ Yes | | ☐ No | |
| 2B-5 | **Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1).  Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned? | | | | ☐ Yes | | ☐ No | |
| 2B-6 | **Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report.  Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls? | | | | ☐ Yes | | ☐ No | |
| 2C | **Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures.  Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered “Yes,” then answer “Yes” to Criteria 2 Result.  If the question in Step 2C is answered “No,” then answer “No” to Criteria 2 Result. | | | | | ☐ Yes | ☐ No | |
| Criteria 2 Result | Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level? | | | | | ☐ Yes | ☐ No | |
| Summarize findings and basis; provide references to related reports or exhibits. | | | | | | | | |
|  | | | | | | | | |
| **Part 1 Result – Full Infiltration Geotechnical Screening [[5]](#footnote-5)** | | **Result** | | | | | | |
| If answers to both Criteria 1 and Criteria 2 are “Yes”, a full infiltration design is potentially feasible based on Geotechnical conditions only.  If either answer to Criteria 1 or Criteria 2 is “No”, a full infiltration design is not required. | | ☐ Full infiltration Condition  ☐ Complete Part 2 | | | | | | |
| **Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria** | | | | | | | | |
| **DMA(s) Being Analyzed:** | | **Project Phase:** | | | | | | |
|  | |  | | | | | | |
| **Criteria 3: Infiltration Rate Screening** | | | | | | | | |
| 3A | **NRCS Type C, D, or “urban/unclassified”:** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or “urban/unclassified” and corroborated by available site soil data?  ☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer “Yes” to Criteria 3 Result.  ☐ Yes; the site is mapped as D soils or “urban/unclassified” and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer “Yes” to Criteria 3 Result.  ☐ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B. | | | | | | | |
| 3B | **Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr?  ☐ Yes; the site may support partial infiltration. Answer “Yes” to Criteria 3 Result.  ☐ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer “No” to Criteria 3 Result. | | | | | | | |
| Criteria 3 Result | Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP?  ☐ Yes; Continue to Criteria 4.  ☐ No: Skip to Part 2 Result. | | | | | | | |
| Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate). | | | | | | | | |
|  | | | | | | | | |
| **Criteria 4: Geologic/Geotechnical Screening** | | | | | | | | |
| 4A | If all questions in Step 4A are answered “Yes,” continue to Step 2B.  For any “No” answer in Step 4A answer “No” to Criteria 4 Result, and submit an “Infiltration Feasibility Condition Letter” that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP. | | | | | | | |
| 4A-1 | Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick? | | | ☐ Yes | | | | ☐ No |
| 4A-2 | Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls? | | | ☐ Yes | | | | ☐ No |
| 4A-3 | Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope? | | | ☐ Yes | | | | ☐ No |
| 4B | When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1  If all questions in Step 4B are answered “Yes,” then answer “Yes” to Criteria 4 Result.  If there are any “No” answers continue to Step 4C. | | | | | | | |
| 4B-1 | **Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP.  Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks? | | | ☐ Yes | | | | ☐ No |
| 4B-2 | **Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs.  Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks? | | | ☐ Yes | | | | ☐ No |
| 4B-3 | **Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities.  Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks? | | | ☐ Yes | | | | ☐ No |
| 4B-4 | **Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required.  Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks? | | | ☐ Yes | | | | ☐ No |
| 4B-5 | **Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1).  Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned? | | | ☐ Yes | | | | ☐ No |
| 4B-6 | **Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report.  Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls? | | | ☐ Yes | | | | ☐ No |
| 4C | **Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures.  Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered “Yes,” then answer “Yes” to Criteria 4 Result.  If the question in Step 4C is answered “No,” then answer “No” to Criteria 4 Result. | | | ☐ Yes | | | | ☐ No |
| Criteria 4 Result | Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level? | | | ☐ Yes | | | | ☐ No |
| Summarize findings and basis; provide references to related reports or exhibits | | | | | | | | |
|  | | | | | | | | |
| **Part 2 – Partial Infiltration Geotechnical Screening Result[[6]](#footnote-6)** | | | **Result** | | | | | |
| If answers to both Criteria 3 and Criteria 4 are “Yes”, a partial infiltration design is potentially feasible based on geotechnical conditions only.  If answers to either Criteria 3 or Criteria 4 is “No”, then infiltration of any volume is considered to be infeasible within the site. | | | ☐ Partial Infiltration Condition  ☐ No Infiltration Condition | | | | | |

Worksheet C.4-2: Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions[[7]](#footnote-7)

| **Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions** | | | **Worksheet C.4-2: Form I-8B[[8]](#footnote-8)** | | |
| --- | --- | --- | --- | --- | --- |
| **Part 1 - Full Infiltration Feasibility Screening Criteria** | | | | | |
| **DMA(s) Being Analyzed:** | | | **Project Phase:** | | |
|  | | |  | | |
| **Criteria 1: Groundwater Screening** | | | | | |
| 1A | **Groundwater Depth.** Is the depth to seasonally high groundwater tables (normal high depth during the wet season) beneath the base of any full infiltration BMP greater than 10 feet?  ☐ Yes; continue to Step 1B.  ☐ No; The depth to groundwater is less than or equal to 10 feet, but site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to step 1B.  ☐ ☐ No; The depth to groundwater is less than or equal to 10 feet and site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer “No” for Criteria 1 Result. | | | | |
| 1B | **Contaminated Soil/Groundwater.** Are proposed full infiltration BMPs at least 250 feet away from contaminated soil or groundwater sites? This can be confirmed using GeoTracker (geotracker.waterboards.ca.gov) to identify open contaminated sites. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.  ☐ ☐ Yes; continue to Step 1C.  ☐ No; However, site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to Step 1C.  ☐ No; Site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer “No” to Criteria 1 Result. | | | | |
| 1C | **Inadequate Soil Treatment Capacity.** Are full infiltration BMPs proposed in DMA soils that have adequate soil treatment capacity?  The DMA has adequate soil treatment capacity if **ALL** of the following criteria (detailed in C.2.2.1) for all soil layers beneath the infiltrating surface are met:   * USDA texture class is sandy loam or loam or silt loam or silt or sandy clay loam or clay loam or silty clay loam or sandy clay or silty clay or clay; and * Cation Exchange Capacity (CEC) greater than 5 milliequivalents/100g; and * Soil organic matter is greater than 1%; and * Groundwater table is equal to or greater than 10 feet beneath the base of the full infiltration BMP.   ☐ ☐ Yes; continue to Step 1D.  ☐ No; However, site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to Step 1D.  ☐ No; Site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer “No” to Criteria 1 Result. | | | | |
| 1D | **Other Groundwater Contamination Hazards.** Are there site-specific groundwater contamination hazards not already mentioned (refer to Appendix C.2.2) that can be reasonably mitigated to support full infiltration BMPs?  ☐ ☐ Yes; there are other contamination hazards identified that can be mitigated. Answer “Yes” to Criteria 1 Result.  ☐ No; there are other contamination hazards identified that cannot be mitigated. Answer “No” to Criteria 1 Result.  ☐ N/A; no contamination hazards are identified. Answer “Yes” to Criteria 1 Result. | | | | |
| Criteria 1 Result | Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination that cannot be reasonably mitigated to an acceptable level? See Appendix C.2.2.8 for a list of typically reasonable and typically unreasonable mitigation measures.  ☐ Yes; Continue to Part 1, Criteria 2.  ☐ No; Continue to Part 1 Result. | | | | |
| Summarize groundwater quality and any mitigation measures proposed. Documentation should focus on groundwater table, mapped soil types and contaminated site locations. | | | | | |
|  | | | | | |
| **Criteria 2: Water Balance Screening** | | | | | |
| 2A | **Ephemeral Stream Setback.** Does the proposed full infiltration BMP meet both the following?   * The full infiltration BMP is located at least 250 feet away from an ephemeral stream; **AND** * The bottom surface of the full infiltration BMP is at a depth 20 feet or greater from seasonally high groundwater tables.   ☐ ☐ Yes; Answer “Yes” to Criteria 2 Result.  ☐ No; Continue to Step 2B. | | | | |
| 2B | **Mitigation Measures.** Can site layout changes be proposed to support full infiltration BMPs?  ☐ Yes; the site can be reconfigured to mitigate potential water balance issues. Answer “Yes” to Criteria 2 Result.  ☐ No; the site cannot be reconfigured to mitigate potential water balance issues. Continue to Step 2C and provide discussion. | | | | |
| 2C | **Additional studies.** Do additional studies support full infiltration BMPs?  In the event that water balance effects are used to reject full infiltration (anticipated to be rare), additional analysis shall be completed and documented by a qualified professional indicating the site-specific information evaluated and the technical basis for this finding.  ☐ Yes; Answer “Yes” to Criteria 2 Result.  ☐ No; Answer “No” to Criteria 2 Result. | | | | |
| Criteria 2 Result | Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams?  ☐ Yes; Continue to Part 1 Result.  ☐ No; Continue to Part 1 Result. | | | | |
| Summarize potential water balance effects. Documentation should focus on mapping and soil data regarding proximity to ephemeral streams and groundwater depth. | | | | | |
|  | | | | | |
| **Part 1 – Full Infiltration Groundwater and Water Balance Screening Result[[9]](#footnote-9)** | | | | **Result** | |
| If answers to Criteria 1 and 2 are “Yes”, a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration based on groundwater conditions.  If answer to Criteria 1 or Criteria 2 is “No”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design based on groundwater conditions. Proceed to Part 2. | | | | ☐ Full Infiltration  ☐ Complete Part 2 | |
| **Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria** | | | | | |
| **DMA(s) Being Analyzed:** | | **Project Phase:** | | | |
|  | |  | | | |
| **Criteria 3: Groundwater Screening** | | | | | |
| **Contaminated Soil/Groundwater.** Are partial infiltration BMPs proposed at least 100 feet away from contaminated soil or groundwater sites? This can be confirmed using GeoTracker (geotracker.waterboards.ca.gov) to identify open contaminated sites. This criterion is intentionally a smaller radius than full infiltration, as the potential quantity of infiltration from partial infiltration BMPs is smaller.  ☐ ☐ Yes; Answer “Yes” to Criteria 3 Result.  ☐ No; However, site layout changes can be proposed to avoid contaminated soils or soils that lack adequate treatment capacity. Select “Yes” to Criteria 3 Result. It is a requirement for the SWQMP preparer to identify potential mitigation measures.  ☐ No; Contaminated soils or soils that lack adequate treatment capacity cannot be avoided and partial infiltration BMPs are not feasible. Select “No” to Criteria 3 Result. | | | | | |
| Criteria 3 Result: Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing risk of groundwater contamination that cannot be reasonably mitigated to an acceptable level?  ☐ Yes; Continue to Part 2, Criteria 4.  If ☐ No; Skip to Part 2 Result. | | | | | |
| Summarize findings and basis. Documentation should focus on mapped soil types and contaminated site locations. | | | | | |
|  | | | | | |
| **Criteria 4: Water Balance Screening** | | | | | |
| **Additional studies.** In the event that water balance effects are used to reject partial infiltration (anticipated to be rare), a qualified professional must provide an analysis of the incremental effects of partial infiltration BMPs on the water balance compared to incidental infiltration under a no infiltration scenario (e.g. precipitation, irrigation, etc.). | | | | | |
| Criteria 4 Result: Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams?  ☐ Yes: Continue to Part 2 Result.  If ☐ No: Continue to Part 2 Result. | | | | | |
| Summarize potential water balance effects. Documentation should focus on mapping and soil data regarding proximity to ephemeral streams and groundwater depth | | | | | |
|  | | | | | |
| **Part 2 – Partial Infiltration Groundwater and Water Balance Screening Result[[10]](#footnote-10)** | | | | | **Result** |
| If answers to Criteria 3 and Criteria 4 are “Yes”, a partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration based on groundwater and water balance conditions.  If answer to Criteria 3 or Criteria 4 is “No”, then infiltration of any volume is considered to be infeasible within the site. The feasibility screening category is No Infiltration based on groundwater or water balance condition. | | | | | ☐ Partial Infiltration Condition  ☐ No Infiltration Condition |

| **Factor of Safety and Design Infiltration Rate Worksheet** | | | | **Form I-9** | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Factor Category** | | **Factor Description** | **Assigned Weight (w)** | **Factor Value (v)** | | **Product (p)**  **p = w x v** |
| A | Suitability Assessment | Soil assessment methods | 0.25 |  | |  |
| Predominant soil texture | 0.25 |  | |  |
| Site soil variability | 0.25 |  | |  |
| Depth to groundwater or impervious layer | 0.25 |  | |  |
| Suitability Assessment Safety Factor, SA = Σp | | | |  |
| B | Design | Level of pretreatment/ expected sediment loads | 0.5 |  | |  |
| Redundancy/resiliency | 0.25 |  | |  |
| Compaction during construction | 0.25 |  | |  |
| Design Safety Factor, SB = Σp | | | |  |
| Combined Safety Factor, Stotal= SA x SB | | | | |  | |
| Observed Infiltration Rate, inch/hr, Kobserved  (corrected for test-specific bias) | | | | |  | |
| Design Infiltration Rate, in/hr, Kdesign = Kobserved / Stotal | | | | |  | |
| **Supporting Data** | | | | | | |
| Briefly describe infiltration test and provide reference to test forms: | | | | | | |
|  | | | | | | |
| **The Geotechnical Engineer certifies they completed Form I-9 (see Appendix C.4.3).**  Professional Geotechnical Engineer's Printed Name:  [SEAL]  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Professional Geotechnical Engineer's Signed Name:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | |

# ATTACHMENT 2

## BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

**Indicate which Items are Included behind this cover sheet:**

|  |  |  |
| --- | --- | --- |
| **Attachment Sequence** | **Contents** | **Checklist** |
| Attachment 2a | Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required)  See Chapter 6 and Appendix G of the Storm Water Design Manual | Included  Submitted as separate stand-alone document |
| Attachment 2b | Hydromodification Management Exhibit (Required) | Included  See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet. |
| Attachment 2c | Management of Critical Coarse Sediment Yield Areas  See Section 6.2 and Appendix H of the Storm Water Design Manual. | Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped in the WMAA AND,  Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment OR,  Demonstration that the downstream system is not sensitive to preservation of Coarse Sediment Supply (Form I-11).  Demonstration that project does not generate a net impact on the receiving water. |
| Attachment 2d | Geomorphic Assessment of Receiving Channels (Optional)  See Section 6.3.4 of the Storm Water Design Manual. | Not performed  Included  Submitted as separate stand-alone document |
| Attachment 2e | Vector Control Plan (Required when structural BMPs will not drain in 96 hours) | Included  Not required because BMPs will drain in less than 96 hours |

**Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:**

The Hydromodification Management Exhibit must identify:

Underlying hydrologic soil group

Approximate depth to groundwater

Existing natural hydrologic features (watercourses, seeps, springs, wetlands)

Critical coarse sediment yield areas to be protected

Existing topography

Existing and proposed site drainage network and connections to drainage offsite

Proposed grading

Proposed impervious features

Proposed design features and surface treatments used to minimize imperviousness

Point(s) of Compliance (POC) for Hydromodification Management

Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)

Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Downstream Systems Requirements for Preservation of Coarse Sediment Supply** | | | **Form I-11** | |
| When it has been determined that potential critical coarse sediment yield areas exist within the project site, the next step is to determine whether downstream systems would be sensitive to reduction of coarse sediment yield from the project site. Use this form to document the evaluation of downstream systems requirements for preservation of coarse sediment supply. | | | | |
| Project Name: | | | | |
| Project Tracking Number / Permit Application Number: | | | | |
| 1 | Will the project discharge runoff to a hardened MS4 system (pipe or lined channel) or an un-lined channel? | Hardened MS4 system | | Go to 2 |
| Un-lined channel | | Go to 4 |
| 2 | Will the hardened MS4 system convey sediment (e.g., a concrete-lined channel with steep slope and cleansing velocity) or sink sediment (e.g., flat slopes, constrictions, treatment BMPs, or ponds with restricted outlets within the system will trap sediment and not allow conveyance of coarse sediment from the project site to an un-lined system). | Convey | | Go to 3 |
| Sink | | Go to 7 |
| 3 | What kind of receiving water will the hardened MS4 system convey the sediment to? | Un-lined channel | | Go to 4 |
| Lake  Reservoir  Bay | | Go to 7 |
| Lagoon  Ocean | | Go to 6 |
| 4 | Is the un-lined channel impacted by deposition of sediment? This condition must be documented by the local agency. | Yes | | Go to 7 |
| No | | Go to 5 |
| 5 | End – Preserve coarse sediment supply to protect un-lined channels from accelerated erosion due to reduction of coarse sediment yield from the project site unless further investigation determines the sediment is not critical to the receiving stream. Sediment that is critical to receiving streams is the sediment that is a significant source of bed material to the receiving stream (bed sediment supply) (see Section 6.2.3 and Appendix H.2 of the manual). | | | | |
| 6 | End – Provide management measures for preservation of coarse sediment supply (protect beach sand supply). | | | | |
| 7 | End – Downstream system does not warrant preservation of coarse sediment supply, no measures for protection of critical coarse sediment yield areas onsite are necessary. Use the space below to describe the basis for this finding for the project. | | | | |

# ATTACHMENT 3

## Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

**Indicate which Items are Included behind this cover sheet:**

|  |  |  |
| --- | --- | --- |
| **Attachment Sequence** | **Contents** | **Checklist** |
| Attachment 3a | Structural BMP Maintenance Plan (Required) | Included  See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet. |
| Attachment 3b | Draft Storm Water Control Facilities Maintenance Agreement (SWCFMA) (when applicable) | Included  Not Applicable |

**Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:**

**Attachment 3a must identify:**

Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 and Appendix E of the Storm Water Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)

How to access the structural BMP(s) to inspect and perform maintenance

Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)

Manufacturer and part number for proprietary parts of structural BMP(s) when applicable

Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)

Recommended equipment to perform maintenance

When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

**Attachment 3b:** For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the City’s standard format (PDP applicant to contact City staff to obtain the current maintenance agreement forms or download from City’s website).

# ATTACHMENT 4

## City of Escondido PDP Structural BMP Verification for Permitted Land Development Projects

This is the cover sheet for Attachment 4.

|  |  |
| --- | --- |
| **City of Escondido Storm Water Structural BMP Verification Form Page 1 of 3** | |
| **Project Summary Information** | |
| Project Name |  |
| Permit Number (e.g., grading/improvement plan number) |  |
| Project Address |  |
| Assessor's Parcel Number(s) (APN(s)) |  |
| Project Watershed  (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier) |  |
| Maintenance Notification / Agreement No. |  |
| **Responsible Party for Construction Phase** | |
| Developer's Name |  |
| Address |  |
| Email Address |  |
| Phone Number |  |
| Engineer of Work |  |
| Engineer's Phone Number |  |
| **Responsible Party for Ongoing Maintenance** | |
| Owner's Name(s)\* |  |
| Address |  |
| Email Address |  |
| Phone Number |  |
| \*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout. | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **City of Escondido Storm Water Structural BMP Verification Form Page 2 of 3** | | | | |
| **Stormwater Structural Pollutant Control & Hydromodification Control BMPs\***  **(List all from SWQMP)** | | | | |
| **Description/Type of Structural BMP** | **Plan Sheet #** | **Structural**  **BMP ID#** | **Maintenance Agreement Recorded Doc #** | **Revisions** |
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| \*All Priority Development Projects (PDPs) require a Structural BMP | | | | |

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

|  |
| --- |
| **City of Escondido Storm Structural BMP Verification Form Page 3 of 3** |

**Checklist for Engineer of Work (EOW) to submit to Field Engineering:**

Copy of the final accepted SWQMP and any accepted addendum.

Copy of the most current plan showing the Storm Water Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.

Photograph of each Structural BMP.

Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.

Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the City reserves the right to inspect the above BMPs to verify compliance with the approved plans and Storm Water Ordinance. Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

[SEAL]

Professional Engineer's Printed Name:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Professional Engineer's Signed Name:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

# ATTACHMENT 5

## Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design BMPs

This is the cover sheet for Attachment 5.

**Use this checklist to ensure the required information has been included on the plans:**

**The plans must identify:**

Structural BMP(s) with ID numbers matching Step 5 Summary of PDP Structural BMPs

The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit

Details and specifications for construction of structural BMP(s)

Signage indicating the location and boundary of structural BMP(s) as required by City staff

How to access the structural BMP(s) to inspect and perform maintenance

Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)

Manufacturer and part number for proprietary parts of structural BMP(s) when applicable

Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)

Recommended equipment to perform maintenance

When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)

All BMPs must be fully dimensioned on the plans

When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.

Include all source control and site design measures described in Steps 3 and 4 of the SWQMP. Can be included as a separate exhibit as necessary.

**\*Note: Plan sheets included in this attachment can be full size or half size.**

1. Redevelopment is defined as: The creation 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. 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 routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; sidewalks; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair. [↑](#footnote-ref-1)
2. Note that it is not required to investigate each and every criterion in the worksheet, a single “no” answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition. [↑](#footnote-ref-2)
3. This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design. [↑](#footnote-ref-3)
4. Available data includes site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements. [↑](#footnote-ref-4)
5. To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings. [↑](#footnote-ref-5)
6. To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings. [↑](#footnote-ref-6)
7. Note that it is not required to investigate each and every criterion in the worksheet, a single “no” answer in Part 1, Part 2, part 3, or Part 4 determines a full, partial, or no infiltration condition. [↑](#footnote-ref-7)
8. This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design. [↑](#footnote-ref-8)
9. To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings. [↑](#footnote-ref-9)
10. To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings. [↑](#footnote-ref-10)