Appendix H1

Stormwater Quality Management Plan

[City of San Marcos]

PRIORITY DEVELOPMENT PROJECT (PDP)
STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)
FOR
Sunrise

PERMIT APPLICATION #:

ASSESSOR'S PARCEL NUMBER(S):

ENGINEER OF WORK:

_____

William Lundstrom, RCE 61630

PREPARED FOR:
The Sunrise Gardens Project Owner, LLC
160 Industrial Street, #200
San Marcos, CA 92078

PDP SWQMP PREPARED BY:
Lundstrom Engineering & Surveying, Inc.
5333 Mission Center Road
San Diego, CA 92108
619-814-1220

DATE OF SWQMP:
January 2, 2017
Revised: April 10, 2017

PLANS PREPARED BY:
Lundstrom Engineering & Surveying, Inc.

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ACRONYMS

APN	Assessor's Parcel Number
BMP	Best Management Practice
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
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
SWQMP	Storm Water Quality Management Plan

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: Sunrise
Permit Application Number:

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 [INSERT AGENCY NAME] BMP Design Manual, which is a design manual for compliance with local [INSERT AGENCY NAME] and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

I have read and understand that the [City Engineer] has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP 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 the [City Engineer] 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

_____
William Lundstrom

_____
Lundstrom Engineering & Surveying, Inc.

_____
Date

Engineer's Seal:

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PDP SWQMP PROJECT OWNER'S CERTIFICATION PAGE

Project Name: Sunrise
Permit Application Number:

PROJECT OWNER'S CERTIFICATION

This PDP SWQMP has been prepared for Sunrise Garden Project Owner by Lundstrom Engineering & Surveying, Inc. The PDP SWQMP is intended to comply with the PDP requirements of the City of San Marcos BMP Design Manual, which is a design manual for compliance with local [INSERT AGENCY NAME] and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.

_____
Project Owner's Signature

_____
Print Name

_____
Company

_____
Date

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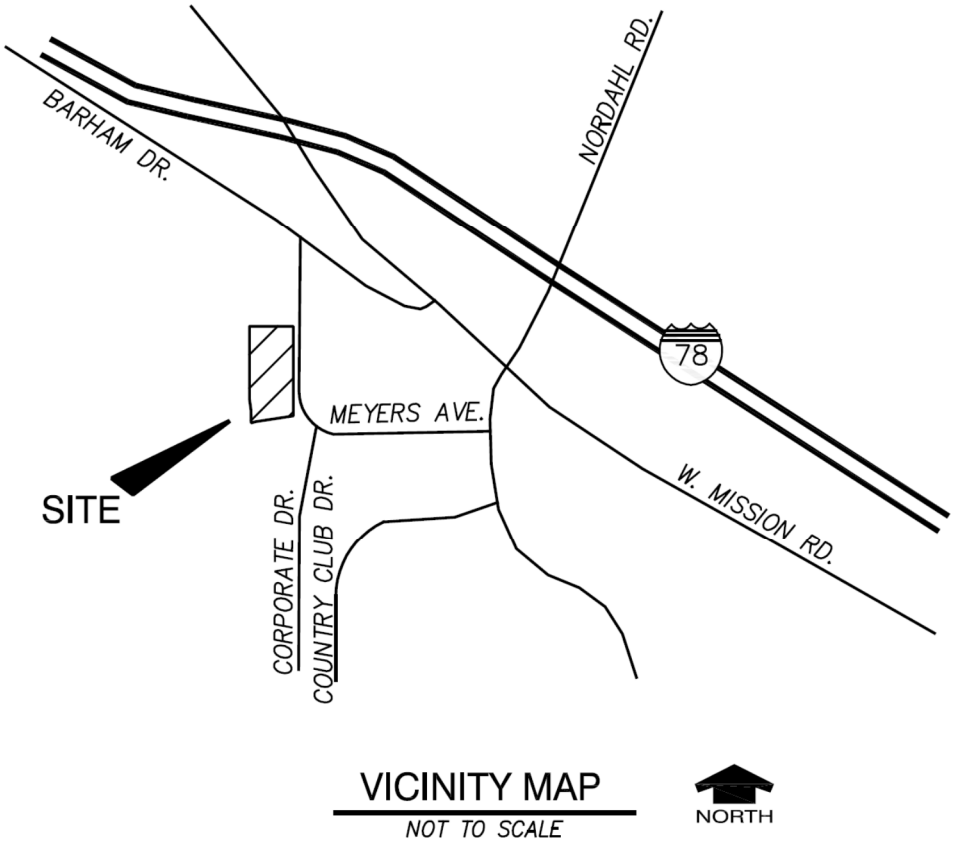
SUBMITTAL RECORD

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.

Submittal Number	Date	Project Status	Summary of Changes
1	04/02/2018	☑ Preliminary Design / Planning/ CEQA ☐ Final Design	Initial Submittal
2		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
3		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
4		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	

PROJECT VICINITY MAP

Project Name: Sunrise
Permit Application Number:



Applicability of Storm Water Best Management Practices (BMP) Requirements **(Storm Water Intake Form for all Development Permit Applications)** **For detailed information please visit:** **http://www.san-marcos.net/departments/development-services/stormwater/development-planning**	**Form I-1** [March 15, 2016]

Project Identification

Project Name: Sunrise

Description: The 14.40 acre property is undeveloped land bordered by a mobile home park to the north and west; and commercial development to the south and east. See Existing Condition Exhibit in Appendix B.

In the existing undeveloped condition, runoff generated on-site surface flows to the southeast corner of the site and to the northeast corner from two drainage basins. An existing concrete ditch located at the southeast corner of the site, collects and conveys site runoff to an existing storm drain inlet in Corporate Drive. Site runoff that is convey to the northeast surface flows across an existing undeveloped commercial lot onto Meyers Avenue. Runoff from the project site flows 500–feet north along Meyers Avenue to existing public curb inlets located at Meyers Avenue and Barham Drive.

The project proposes a 14.40 acre multifamily development consisting of approximately 35 apartment buildings, private roads and private storm drain systems.

Permit Application Number (if applicable):	Date:

Project Address: **Barham Drive,**
San Marcos, CA 92078

Determination of Requirements

This form is required as part of the City's application process. The purpose of this form is to identify potential land development planning storm water requirements that apply to development projects.

Development projects are defined as construction, rehabilitation, redevelopment, or reconstruction of any public or private projects. In addition, the identification of a development project, as it relates to storm water regulations, would truly apply to development and redevelopment activities that have the potential to contact storm water and contribute a source of pollutants, or reduce the natural absorption and infiltration abilities of the land.

To access the BMP Design Manual, Storm Water Quality Management Plan (SWQMP) templates, and other pertinent information related to this program please refer to:
http://www.san-marcos.net/departments/development-services/stormwater/development-planning

Please answer each of the following steps below, starting with Step 1 and progressing through each step until reaching "Stop".

Step	Answer	Progression
Step 1: Based on the above, Is the project a "development project" (See definition above)? See Section 1.3 of the BMP Design Manual for further guidance if necessary.	☑Yes	Go to Step 2.
	☐ No	Permanent BMP requirements do not apply. No SWQMP will be required. Provide brief discussion below. **STOP.**

Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):

Step 2: Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? **To answer this item, complete Form I-2, Project Type Determination. See Section 1.4 of the BMP Design Manual *in its entirety* for guidance.** **In addition to Section 1.4, please refer to the City's SWQMP Submittal Requirements form.**	☐ Standard Project	Only Standard Project requirements apply, including Standard Project SWQMP. **STOP.**
	☑ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Go to Step 3 on the following page.**
	☐ Exception to PDP definitions	Standard Project requirements apply, and any additional requirements specific to the type of project. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP. **STOP.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Form I-1 Page 2, Form Date: March 15, 2016

Step 3 (PDPs only). Please answer the list of questions in this section to determine if hydromodification requirements reply to the proposed PDP. Does the project:

Step 3a. Discharge storm water runoff directly to the Pacific Ocean?	☐ Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Continue to Step 3b.
Step 3b. Discharge storm water runoff directly to an enclosed embayment, not within protected areas?	Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Continue to Step 3c.
Step 3c. Discharge storm water runoff directly to a water storage reservoir or lake, below spillway or normal operating level?	☐ Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Continue to Step 3d.
Step 3d. Discharge storm water runoff directly to an area identified in WMAA?	☐ Yes	**STOP**. Hydromodification requirements do not apply.
	☑ No	Hydromodification requirements apply to the project. Go to Step 4.
Discussion / justification if hydromodification control requirements do not apply:		

Step 4 (PDPs subject to hydromodification control requirements only). Does protection of critical coarse sediment yield areas apply based on review of WMAA Potential Critical Coarse Sediment Yield Area Map? See Section 6.2 of the BMP Design Manual for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	☑ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.

Project Type Determination Checklist			Form I-2 [March 15, 2016]
Project Information			
Project Name/Description:			
Permit Application Number (if applicable):			Date:
Project Address:			
Project Type Determination: Standard Project or Priority Development Project (PDP)			
The project is (select one): ☑ New Development Redevelopment			
The total proposed newly created or replaced impervious area is: _____ ft^2 (_____) acres			
Is the project in any of the following categories, (a) through (f)?			
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: (i) 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). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) 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. (iv) 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.

Form I-2 Page 2, Form Date: March 15, 2016			
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. See BMP Design Manual Section 1.4.2 for additional guidance.*
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: (i) 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. (ii) 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 BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

No – the project is not a Priority Development Project (Standard Project).

☑ Yes – the project is a Priority Development Project (PDP).

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is: 0 ft^2 (A)

The total proposed newly created or replaced impervious area is 58,820 ft^2 (B)

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 new impervious areas are considered PDP

OR

greater than fifty percent (50%) – the entire project site is a PDP

Site Information Checklist For PDPs	Form I-3B (PDPs) [March 15, 2016]
Project Summary Information	
Project Name	Sunrise Garddens
Project Address	Barham Drive
Assessor's Parcel Number(s) (APN(s))	
Permit Application Number	
Project Hydrologic Unit	Select One: ☐ Santa Margarita 902 ☐ San Luis Rey 903 ☑ Carlsbad 904 ☐ San Dieguito 905 ☐ Penasquitos 906 ☐ San Diego 907 ☐ Pueblo San Diego 908 ☐ Sweetwater 909 ☐ Otay 910 ☐ Tijuana 911
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	San Marcos Creek HAS 904.52
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	14.43 Acres
Area to be Disturbed by the Project (Project Area)	14.43 Acres
Project Proposed Impervious Area (subset of Project Area)	10.10 Acres
Project Proposed Pervious Area (subset of Project Area)	4.33 Acres
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Description of Existing Site Condition

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):

- ☑ Vegetative Cover
- ☑ Non-Vegetated Pervious Areas
- ☐ Impervious Areas

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):

- ☐ GW Depth < 5 feet
- ☐ 5 feet < GW Depth < 10 feet
- ☐ 10 feet < GW Depth < 20 feet
- ☑ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):

- ☐ Watercourses
- ☐ Seeps
- ☐ Springs
- ☐ Wetlands
- ☑ None

Description / Additional Information:

Description of Existing Site Drainage Patterns

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) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3)Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

In the existing undeveloped condition, runoff generated on-site surface flows to the southeast corner of the site and to the northeast corner from two drainage basins. An existing concrete ditch located at the southeast corner of the site, collects and conveys site runoff to an existing storm drain inlet in Corporate Drive. Site runoff that is convey to the northeast surface flows across an existing undeveloped commercial lot onto Meyers Avenue. Runoff from the project site flows 500–feet north along Meyers Avenue to existing public curb inlets located at Meyers Avenue and Barham Drive.

Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:

The project proposes a 14.40 acre multifamily development consisting of approximately 35 apartment buildings, private roads and private storm drain systems.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

The proposed site will consist of approximately 10.10 acres of impervious area in the form of a paved road, paved driveways and roof areas.

List/describe proposed pervious features of the project (e.g., landscape areas):

The proposed site will consist of approximately 4.34 acres of pervious area in the form of landscaped yards and common use areas.

Does the project include grading and changes to site topography?

☑ Yes

☐ No

Description / Additional Information:

Description of Proposed Site Drainage Patterns

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:

The project proposes a 14.40 acre multifamily development consisting of approximately 35 apartment buildings, private roads and private storm drain systems.

The proposed private storm drain system on-site will collect and convey stormwater runoff to two biofiltration basins with hydromodification storage and flow control.

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

Description / Additional Information:

Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable): Project runoff in both existing and proposed conditions enter the existing public storm drain in La Moree Road and is conveyed approximately 1,500-feet downstream into Jacks Pond. It is assumed that Jacks Pond overflows into an existing public conveyance system into San Marcos Creek and then into Lake San Marcos.

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 and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
Sam Marcos Creek	DDE, Phosphorus, Sediment Toxicity, Selenium, Ammonia as Nitrogen, Nutrients	

Identification of Project Site Pollutants*

***Identification of project site pollutants 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 BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Expected from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment		X	X
Nutrients		X	X
Heavy Metals		X	
Organic Compounds			
Trash & Debris		X	
Oxygen Demanding Substances			
Oil & Grease		X	
Bacteria & Viruses		X	
Pesticides		X	X

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☑ Yes, hydromodification management flow control structural BMPs required.

☐ 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.

☐ 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.

☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Critical Coarse Sediment Yield Areas*

***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 Section 6.2 of the BMP Design Manual been performed?

☐ 6.2.1 Verification of Geomorphic Landscape Units (GLUs) Onsite

☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment

☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite

☐ 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 2.b of the SWQMP.

☐ Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Flow Control for Post-Project Runoff*

***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.

The Point of Compliance is located at the existing public storm drain system in La Moree Road.

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)

Other Site Requirements and Constraints

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 for All Development Projects (Standard Projects and Priority Development Projects)	Form I-4 [March 15, 2016]

Project Identification

Project Name

Permit Application Number

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the Model BMP Design Manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the Model BMP 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 may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☑Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☑Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑N/A
Discussion / justification if SC-3 not implemented:			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑N/A
Discussion / justification if SC-4 not implemented:			

Form I-4 Page 2 of 2, Form Date: March 15, 2016			
Source Control Requirement	**Applied?**		
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☑On-site 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 SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Site Design BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects)	Form I-5 [March 15, 2016]

Project Identification

Project Name
Permit Application Number

Site Design BMPs

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 Model BMP Design 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 Model BMP 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 site has no existing natural areas to conserve). Discussion / justification may be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-1 not implemented:			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-2 not implemented:			
SD-3 Minimize Impervious Area	☑Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	☑Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			
SD-5 Impervious Area Dispersion	☑Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			

Form I-5 Page 2 of 2, Form Date: March 15, 2016			
Site Design Requirement	**Applied?**		
SD-6 Runoff Collection	☑Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	☑Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☐ No	☑N/A
Discussion / justification if SD-8 not implemented:			

Summary of PDP Structural BMPs	Form I-6 (PDPs) [March 15, 2016]

Project Identification

Project Name

Permit Application Number

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design 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 BMP Design 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 and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the BMP Design 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).

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 BMP Design 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.

The proposed private storm drain system on-site will collect and convey stormwater runoff to two biofiltration basins with hydromodification storage and flow control.

(Continue on page 2 as necessary.)

(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from page 1)

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)
- ☐ 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 if required by the [City Engineer] (See Section 1.12 of the BMP Design Manual)	William Lundstrom
Who will be the final owner of this BMP?	Property Management/Owner
Who will maintain this BMP into perpetuity?	Property Management/Owner
What is the funding mechanism for maintenance?	

Form I-6 Page 4 of X (Copy as many as needed) , Form Date: March 15, 2016
Structural BMP ID No.
Construction Plan Sheet No.
Discussion (as needed):

ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

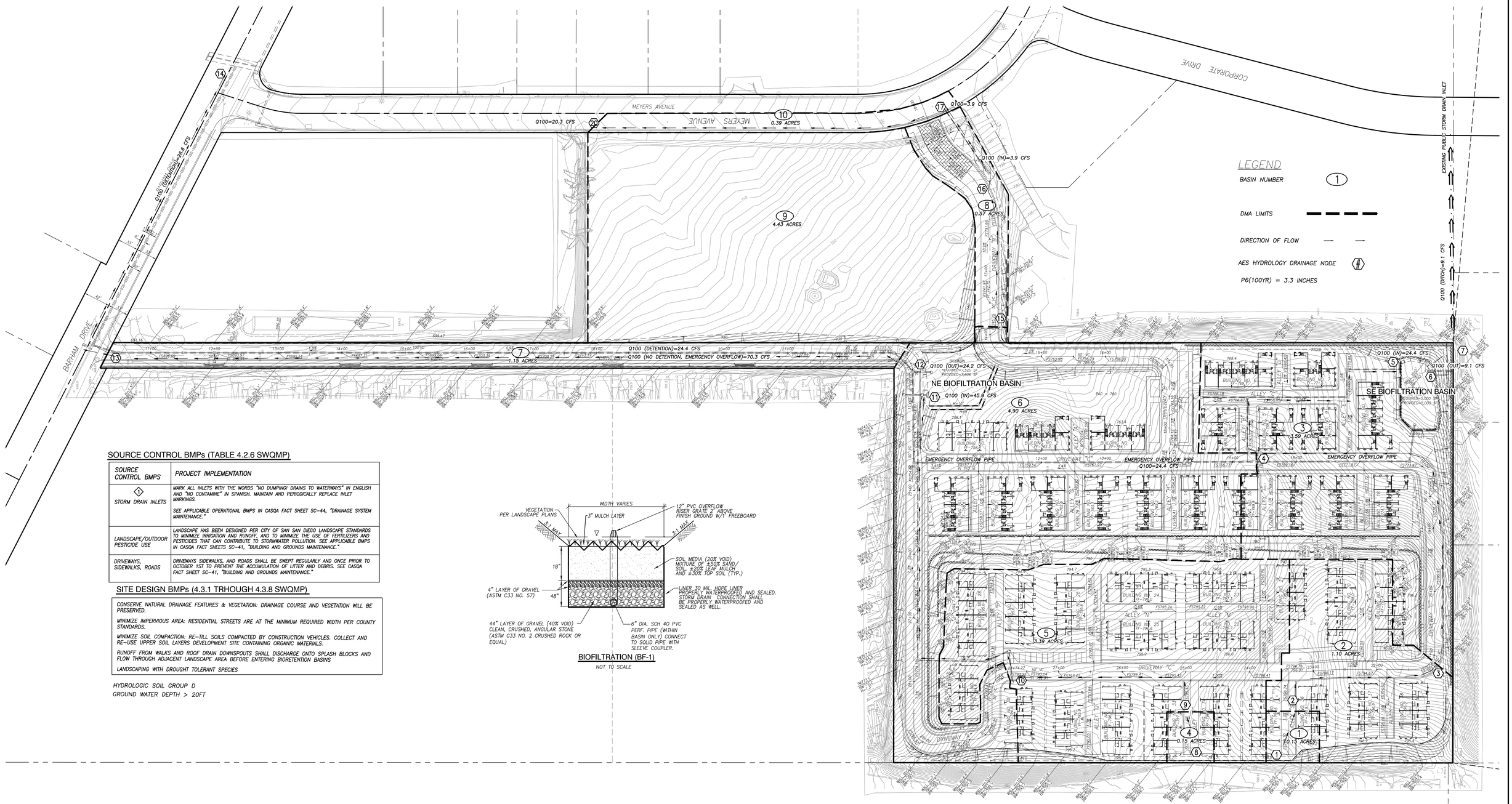
Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☐ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☐ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☐ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☐ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines	☐ Included

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

The DMA 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 and impervious areas
- ☐ Existing and proposed site drainage network and connections to drainage offsite
- ☐ Proposed demolition
- ☐ Proposed grading
- ☐ Proposed impervious features
- ☐ 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 Form I-3B)
- ☐ Structural BMPs (identify location, type of BMP, and size/detail)



SOURCE CONTROL BMPs (TABLE 4.2.6 SWQMP)

SOURCE CONTROL BMPS	PROJECT IMPLEMENTATION
① STORM DRAIN INLETS	MARK ALL INLETS WITH THE WORDS "NO DUMPING! DRAINS TO WATERWAYS" IN ENGLISH AND "NO CONTAMINE" IN SPANISH. MAINTAIN AND PERIODICALLY REPLACE INLET MARKINGS. SEE APPLICABLE OPERATIONAL BMPS IN CASQA FACT SHEET SC-44, "DRAINAGE SYSTEM MAINTENANCE."
LANDSCAPE/OUTDOOR PESTICIDE USE	LANDSCAPE HAS BEEN DESIGNED PER CITY OF SAN SAN DIEGO LANDSCAPE STANDARDS TO MINIMIZE IRRIGATION AND RUNOFF, AND TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES THAT CAN CONTRIBUTE TO STORMWATER POLLUTION. SEE APPLICABLE BMPS IN CASQA FACT SHEETS SC-41, "BUILDING AND GROUNDS MAINTENANCE."
DRIVEWAYS, SIDEWALKS, ROADS	DRIVEWAYS SIDEWALKS, AND ROADS SHALL BE SWEPT REGULARLY AND ONCE PRIOR TO OCTOBER 1ST TO PREVENT THE ACCUMULATION OF LITTER AND DEBRIS. SEE CASQA FACT SHEET SC-41, "BUILDING AND GROUNDS MAINTENANCE."

SITE DESIGN BMPs (4.3.1 TRHOUGH 4.3.8 SWQMP)

CONSERVE NATURAL DRAINAGE FEATURES & VEGETATION: DRAINAGE COURSE AND VEGETATION WILL BE PRESERVED.

MINIMIZE IMPERVIOUS AREA: RESIDENTIAL STREETS ARE AT THE MINIMUM REQUIRED WIDTH PER COUNTY STANDARDS.

MINIMIZE SOIL COMPACTION: RE-TILL SOILS COMPACTED BY CONSTRUCTION VEHICLES. COLLECT AND RE-USE UPPER SOIL LAYERS DEVELOPMENT SITE CONTAINING ORGANIC MATERIALS.

RUNOFF FROM WALKS AND ROOF DRAIN DOWNSPOUTS SHALL DISCHARGE ONTO SPLASH BLOCKS AND FLOW THROUGH ADJACENT LANDSCAPE AREA BEFORE ENTERING BIORETENTION BASINS

LANDSCAPING WITH DROUGHT TOLERANT SPECIES

HYDROLOGIC SOIL GROUP D

GROUND WATER DEPTH > 20FT

BIOFILTRATION (BF-1)

NOT TO SCALE

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

SUNRISE – ORIX
PROPOSED SITE CONDITION

JOB NO.: L300-09 | SCALE: 1"=60' | SHEET: 1 OF 1

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
General Info	0	Drainage Basin ID or Name	BMP #1	BMP#2	-	-	-	-	-	-	-	-	unitless
	1	85th Percentile Storm Depth	0.78	0.78	-	-	-	-	-	-	-	-	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	-	-	-	-	-	-	-	-	in/hr
	3	Total Tributary Area	205,915	360,200	-	-	-	-	-	-	-	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	13,384	23,413	-	-	-	-	-	-	-	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.70	0.73	-	-	-	-	-	-	-	-	unitless
	6	Initial Design Capture Volume	9,369	17,091	-	-	-	-	-	-	-	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	-	-	-	-	-	-	-	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	-	-	-	-	-	-	-	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	144,141	262,946	-	-	-	-	-	-	-	-	square feet
	10	Final Design Capture Volume Tributary to BMP	9,369	17,091	-	-	-	-	-	-	-	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	-	-	-	-	-	-	-	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	187	171	-	-	-	-	-	-	-	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.02	0.01	-	-	-	-	-	-	-	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	3.0%	1.5%	-	-	-	-	-	-	-	-	%
	15	Percent of Average Annual Runoff Retention Required	1.5%	1.5%	-	-	-	-	-	-	-	-	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	4.0%	-	-	-	-	-	-	-	-	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	280,476	-	-	-	-	-	-	-	-	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	-16,407	-	-	-	-	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summairzed in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

Attention!

-Performance standards for onsite pollutant control are not satisfied. The applicant must implement onsite flow-thru BMPs per Worksheet B.6-1 and an offsite alternative compliance project to mitigate for the deficit of effectively treated stormwater.

Automated Worksheet B.5-1: Sizing Lined or Unlined Biofiltration BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	BMP #1	BMP#2	-	-	-	-	-	-	-	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	-	-	-	-	-	-	-	-	in/hr
	2	Effective Tributary Area	144,141	262,946	-	-	-	-	-	-	-	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	-	-	-	-	-	-	-	-	ratio
	4	Design Capture Volume Tributary to BMP	9,369	17,091	-	-	-	-	-	-	-	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	Lined									unitless
	6	Provided Biofiltration BMP Surface Area	5,000	7,900									sq-ft
	7	Provided Surface Ponding Depth	12	12									inches
	8	Provided Soil Media Thickness	18	18									inches
	9	Provided Depth of Gravel Above Underdrain Invert	48	48									inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	1.00	1.10									inches
	11	Provided Depth of Gravel Below the Underdrain	3	3									inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	0.90	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	120	0	0	0	0	0	0	0	0	hours
	17	Volume Retained by BMP	375	593	0	0	0	0	0	0	0	0	cubic-feet
	18	Fraction of DCV Retained	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	9,182	16,920	0	0	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.0667	0.0807	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.58	0.44	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	0.58	0.44	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	3.46	2.65	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	34.80	34.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	29	Drawdown Time for Surface Ponding	21	27	0	0	0	0	0	0	0	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	60	79	0	0	0	0	0	0	0	0	hours
	31	Total Depth Biofiltered	38.26	37.45	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	13,773	25,380	0	0	0	0	0	0	0	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	13,773	24,654	0	0	0	0	0	0	0	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	6,887	12,690	0	0	0	0	0	0	0	0	cubic-feet
	35	Option 2 - Provided Storage Volume	6,887	12,690	0	0	0	0	0	0	0	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	-	-	-	-	-	-	-	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	**-16,407**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined or Unlined Biofiltration BMPs (BF-1, PR-1) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Attention!

-Vegetated BMPs must have a surface ponding drawdown time of 24 hours or less. Drawdown times over 24 hours may be permitted at the discretion of County staff if certified by a landscape architect or agronomist.

-This BMP does not fully satisfy the performance standards for pollutant control and must be supplemented with flow-thru treatment and an offsite alternative compliance project.

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	26,460	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	200	#
	3	Total Planted Area within Development	234,530	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	Yes	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	No	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	373	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	281	cubic-feet
	13	Total Anticipated Use Over 36 Hours	654	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.02	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.

C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.

D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.

E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.

F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

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	Hydromodification Management Exhibit (Required)	☐ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☐ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☐ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☐ 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)

SDHM 3.1

PROJECT REPORT

General Model Information

Project Name:	L300-09 NE BASIN SDHM
Site Name:	Sunrise
Site Address:	
City:	San Marcos
Report Date:	4/4/2018
Gage:	BONITA
Data Start:	10/01/1971
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2018/01/19

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Moderate	8.95
Pervious Total	8.95
Impervious Land Use	acre
Impervious Total	0
Basin Total	8.95

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Urban,Moderate	2.36
Pervious Total	2.36

Impervious Land Use	acre
IMPERVIOUS-FLAT	5.909
Impervious Total	5.909
Basin Total	8.269

Element Flows To:

Surface	Interflow	Groundwater
Surface Biofilter 1	Surface Biofilter 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Biofilter 1

Bottom Length:	100.00 ft.
Bottom Width:	76.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	ESM
Material thickness of second layer:	4
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.96103563264
Offset (in.):	0
Flow Through Underdrain (ac-ft.):	105.699
Total Outflow (ac-ft.):	116.442
Percent Through Underdrain:	90.77
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.2745	0.0000	0.0000	0.0000
0.0934	0.2728	0.0049	0.0000	0.0000
0.1868	0.2709	0.0099	0.0013	0.0000
0.2802	0.2691	0.0149	0.0044	0.0000
0.3736	0.2672	0.0199	0.0071	0.0000
0.4670	0.2653	0.0250	0.0090	0.0000
0.5604	0.2635	0.0301	0.0106	0.0000
0.6538	0.2616	0.0353	0.0119	0.0000
0.7473	0.2598	0.0405	0.0131	0.0000
0.8407	0.2580	0.0457	0.0142	0.0000
0.9341	0.2561	0.0510	0.0152	0.0000
1.0275	0.2543	0.0564	0.0162	0.0000
1.1209	0.2525	0.0618	0.0170	0.0000
1.2143	0.2507	0.0672	0.0179	0.0000
1.3077	0.2489	0.0727	0.0187	0.0000
1.4011	0.2471	0.0782	0.0195	0.0000
1.4945	0.2453	0.0838	0.0202	0.0000
1.5879	0.2435	0.0915	0.0209	0.0000
1.6813	0.2418	0.0994	0.0216	0.0000
1.7747	0.2400	0.1072	0.0223	0.0000
1.8681	0.2382	0.1152	0.0230	0.0000
1.9615	0.2365	0.1232	0.0236	0.0000
2.0549	0.2347	0.1313	0.0242	0.0000
2.1484	0.2330	0.1394	0.0248	0.0000
2.2418	0.2312	0.1476	0.0254	0.0000
2.3352	0.2295	0.1559	0.0260	0.0000
2.4286	0.2278	0.1642	0.0265	0.0000
2.5220	0.2261	0.1726	0.0271	0.0000
2.6154	0.2243	0.1811	0.0276	0.0000

2.7088	0.2226	0.1896	0.0282	0.0000
2.8022	0.2209	0.1982	0.0287	0.0000
2.8956	0.2193	0.2069	0.0296	0.0000
2.9890	0.2176	0.2156	0.0306	0.0000
3.0824	0.2159	0.2244	0.0316	0.0000
3.1758	0.2142	0.2333	0.0325	0.0000
3.2692	0.2125	0.2422	0.0334	0.0000
3.3626	0.2109	0.2512	0.0342	0.0000
3.4560	0.2092	0.2603	0.0351	0.0000
3.5495	0.2076	0.2694	0.0359	0.0000
3.6429	0.2059	0.2786	0.0367	0.0000
3.7363	0.2043	0.2879	0.0375	0.0000
3.8297	0.2027	0.2972	0.0383	0.0000
3.9231	0.2011	0.3066	0.0391	0.0000
4.0165	0.1994	0.3161	0.0398	0.0000
4.1099	0.1978	0.3256	0.0406	0.0000
4.2033	0.1962	0.3353	0.0413	0.0000
4.2967	0.1946	0.3449	0.0420	0.0000
4.3901	0.1930	0.3547	0.0427	0.0000
4.4835	0.1915	0.3645	0.0434	0.0000
4.5769	0.1899	0.3744	0.0440	0.0000
4.6703	0.1883	0.3844	0.0447	0.0000
4.7637	0.1868	0.3944	0.0454	0.0000
4.8571	0.1852	0.4045	0.0460	0.0000
4.9505	0.1836	0.4147	0.0466	0.0000
5.0440	0.1821	0.4249	0.0473	0.0000
5.1374	0.1806	0.4353	0.0479	0.0000
5.2308	0.1790	0.4457	0.0485	0.0000
5.3242	0.1775	0.4561	0.0491	0.0000
5.4176	0.1760	0.4667	0.0497	0.0000
5.5000	0.1745	0.4760	0.0504	0.0000

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
5.5000	0.2745	0.4760	0.0000	0.9344	0.0000
5.5934	0.2764	0.5017	0.0000	0.9344	0.0000
5.6868	0.2783	0.5277	0.0000	0.9892	0.0000
5.7802	0.2802	0.5537	0.0000	1.0440	0.0000
5.8736	0.2821	0.5800	0.0000	1.0987	0.0000
5.9670	0.2840	0.6064	0.0000	1.1535	0.0000
6.0604	0.2859	0.6330	0.0000	1.2083	0.0000
6.1538	0.2878	0.6598	0.0000	1.2631	0.0000
6.2473	0.2898	0.6868	0.0000	1.3178	0.0000
6.3407	0.2917	0.7140	0.0000	1.3726	0.0000
6.4341	0.2937	0.7413	0.0000	1.4274	0.0000
6.5275	0.2956	0.7688	0.0000	1.4822	0.0000
6.6209	0.2976	0.7965	0.0000	1.5369	0.0000
6.7143	0.2995	0.8244	0.0000	1.5917	0.0000
6.8077	0.3015	0.8525	0.0000	1.6465	0.0000
6.9011	0.3035	0.8808	0.0000	1.7013	0.0000
6.9945	0.3055	0.9092	0.0000	1.7560	0.0000
7.0879	0.3075	0.9378	0.0000	1.8108	0.0000
7.1813	0.3095	0.9666	0.0000	1.8656	0.0000
7.2747	0.3115	0.9956	0.0000	1.9204	0.0000
7.3681	0.3135	1.0248	0.0000	1.9751	0.0000
7.4615	0.3155	1.0542	0.0000	2.0299	0.0000
7.5549	0.3175	1.0838	0.1365	2.0847	0.0000
7.6484	0.3196	1.1135	0.5952	2.1395	0.0000

7.7418	0.3216	1.1435	1.1671	2.1942	0.0000
7.8352	0.3236	1.1736	1.6924	2.2490	0.0000
7.9286	0.3257	1.2039	2.0472	2.3038	0.0000
8.0220	0.3278	1.2344	2.2755	2.3586	0.0000
8.1154	0.3298	1.2652	2.4708	2.4133	0.0000
8.2088	0.3319	1.2961	2.6517	2.4681	0.0000
8.3022	0.3340	1.3272	2.8210	2.5229	0.0000
8.3956	0.3360	1.3585	2.9807	2.5777	0.0000
8.4890	0.3381	1.3899	3.1323	2.6324	0.0000
8.5000	0.3384	1.3937	3.2769	2.6389	0.0000

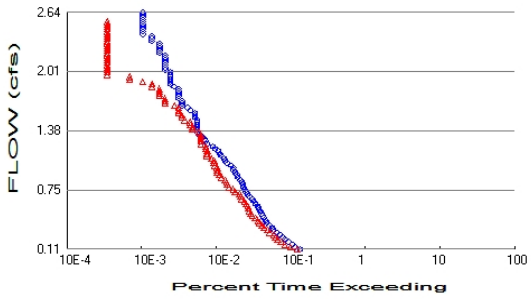
Surface Biofilter 1

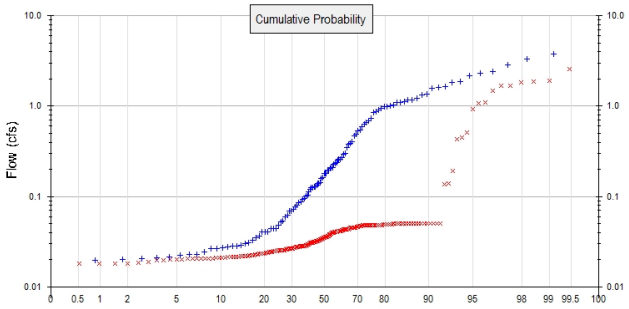
Element Flows To:

Outlet 1	Outlet 2
	Biofilter 1

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 8.95
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.36
Total Impervious Area: 5.909

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	1.123696
5 year	1.913701
10 year	2.644718
25 year	3.508599

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.049764
5 year	1.51757
10 year	1.85747
25 year	2.214503

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1124	384	350	91	Pass
0.1379	330	286	86	Pass
0.1635	302	240	79	Pass
0.1891	267	214	80	Pass
0.2147	241	194	80	Pass
0.2403	227	181	79	Pass
0.2658	208	172	82	Pass
0.2914	188	152	80	Pass
0.3170	168	141	83	Pass
0.3426	162	127	78	Pass
0.3682	148	119	80	Pass
0.3937	139	111	79	Pass
0.4193	134	105	78	Pass
0.4449	126	97	76	Pass
0.4705	122	88	72	Pass
0.4961	116	84	72	Pass
0.5216	112	80	71	Pass
0.5472	108	78	72	Pass
0.5728	104	77	74	Pass
0.5984	97	73	75	Pass
0.6240	91	69	75	Pass
0.6495	89	64	71	Pass
0.6751	81	61	75	Pass
0.7007	76	60	78	Pass
0.7263	72	52	72	Pass
0.7519	69	49	71	Pass
0.7774	67	43	64	Pass
0.8030	66	41	62	Pass
0.8286	64	40	62	Pass
0.8542	61	38	62	Pass
0.8797	57	34	59	Pass
0.9053	55	32	58	Pass
0.9309	52	30	57	Pass
0.9565	49	30	61	Pass
0.9821	49	30	61	Pass
1.0076	46	28	60	Pass
1.0332	40	27	67	Pass
1.0588	38	27	71	Pass
1.0844	37	25	67	Pass
1.1100	34	22	64	Pass
1.1355	33	22	66	Pass
1.1611	31	22	70	Pass
1.1867	28	21	75	Pass
1.2123	26	21	80	Pass
1.2379	22	18	81	Pass
1.2634	21	18	85	Pass
1.2890	20	18	90	Pass
1.3146	19	18	94	Pass
1.3402	17	18	105	Pass
1.3658	16	17	106	Pass
1.3913	16	14	87	Pass
1.4169	16	14	87	Pass
1.4425	16	13	81	Pass

1.4681	16	13	81	Pass
1.4937	16	11	68	Pass
1.5192	15	10	66	Pass
1.5448	15	10	66	Pass
1.5704	15	9	60	Pass
1.5960	13	9	69	Pass
1.6215	12	9	75	Pass
1.6471	10	8	80	Pass
1.6727	10	6	60	Pass
1.6983	10	6	60	Pass
1.7239	9	6	66	Pass
1.7494	9	5	55	Pass
1.7750	9	5	55	Pass
1.8006	9	5	55	Pass
1.8262	9	5	55	Pass
1.8518	8	4	50	Pass
1.8773	7	4	57	Pass
1.9029	7	3	42	Pass
1.9285	7	2	28	Pass
1.9541	7	2	28	Pass
1.9797	7	1	14	Pass
2.0052	7	1	14	Pass
2.0308	6	1	16	Pass
2.0564	6	1	16	Pass
2.0820	6	1	16	Pass
2.1076	6	1	16	Pass
2.1331	6	1	16	Pass
2.1587	6	1	16	Pass
2.1843	6	1	16	Pass
2.2099	5	1	20	Pass
2.2354	5	1	20	Pass
2.2610	5	1	20	Pass
2.2866	5	1	20	Pass
2.3122	5	1	20	Pass
2.3378	4	1	25	Pass
2.3633	4	1	25	Pass
2.3889	4	1	25	Pass
2.4145	3	1	33	Pass
2.4401	3	1	33	Pass
2.4657	3	1	33	Pass
2.4912	3	1	33	Pass
2.5168	3	1	33	Pass
2.5424	3	1	33	Pass
2.5680	3	0	0	Pass
2.5936	3	0	0	Pass
2.6191	3	0	0	Pass
2.6447	3	0	0	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

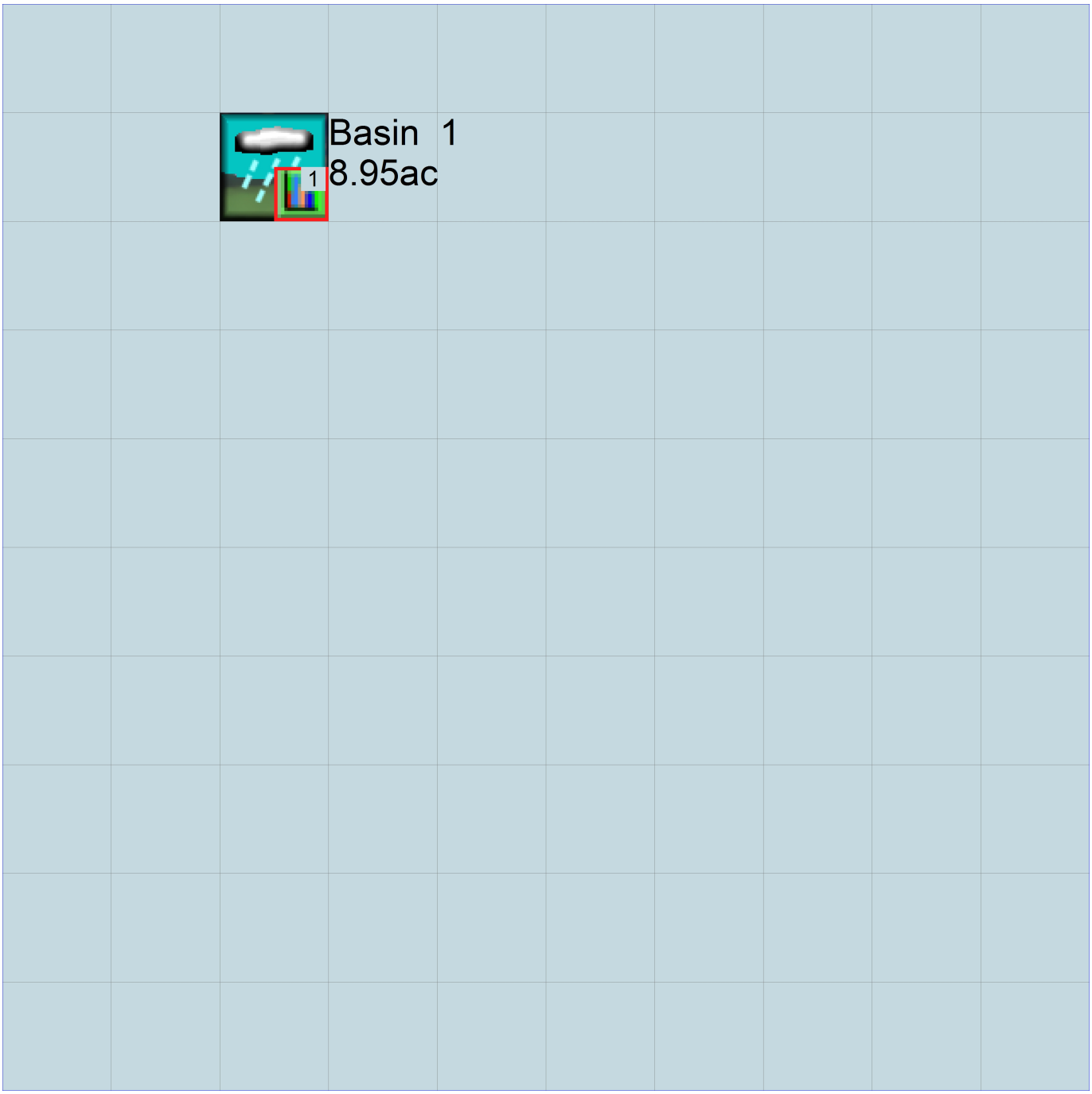
PERLND Changes

No PERLND changes have been made.

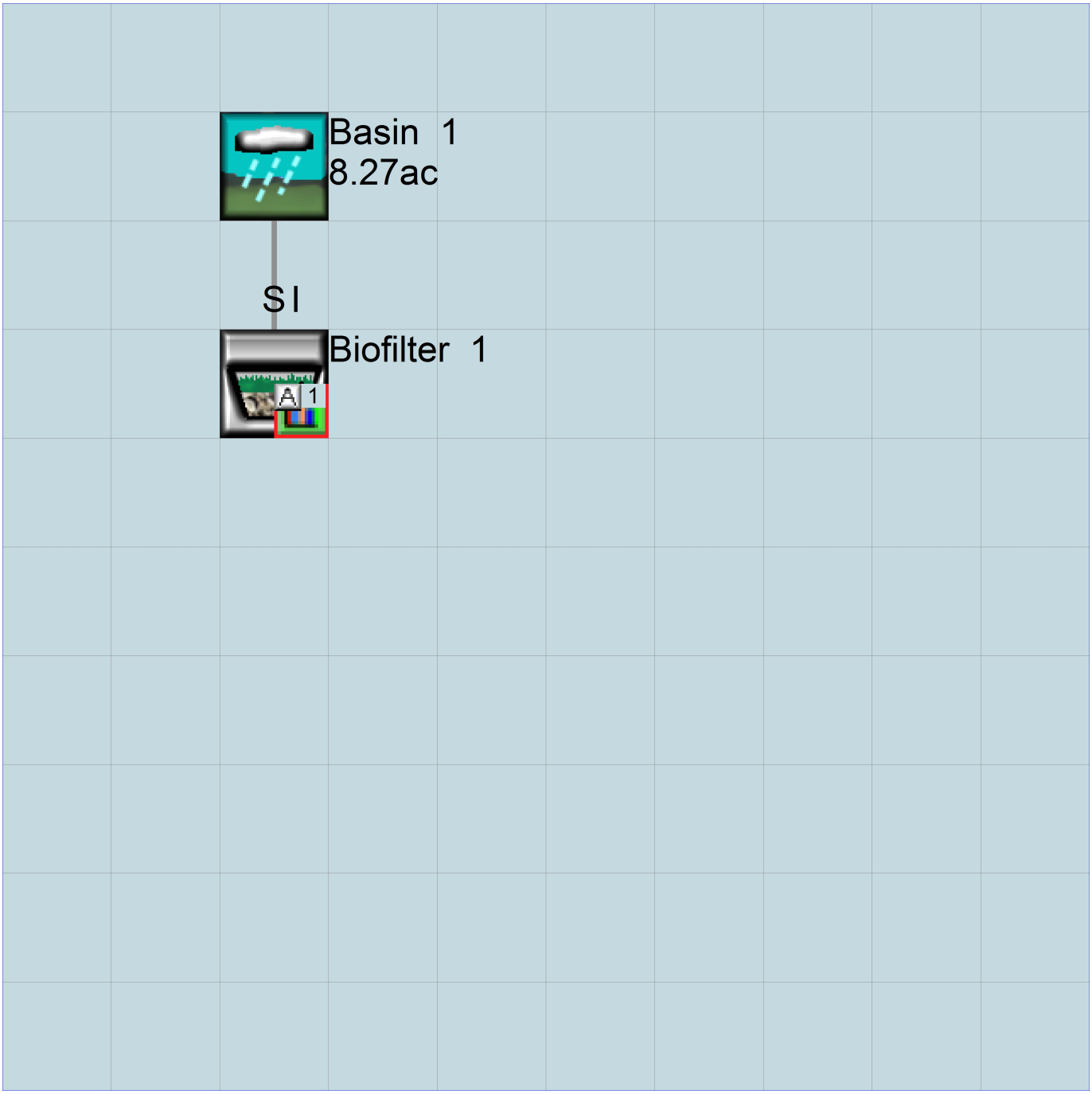
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1971 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   L300-09 NE BASIN SDHM.wdm
MESSU       25   PreL300-09 NE BASIN SDHM.MES
            27   PreL300-09 NE BASIN SDHM.L61
            28   PreL300-09 NE BASIN SDHM.L62
            30   POCL300-09 NE BASIN SDHM1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      29
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                      in  out           ***
   29      D,NatVeg,Moderate      1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   29         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   29         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   29             0         3     0.025        80       0.1       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   29             0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   29             0       0.6      0.04         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   29       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   29       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   29             0         0      0.01         0       0.4      0.01         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2
```

```
  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  29                        8.95     COPY   501     12
PERLND  29                        8.95     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><---><--->
  END HYDR-INIT
END RCHRES
```

```
SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1971 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   L300-09 NE BASIN SDHM.wdm
MESSU       25   MitL300-09 NE BASIN SDHM.MES
            27   MitL300-09 NE BASIN SDHM.L61
            28   MitL300-09 NE BASIN SDHM.L62
            30   POCL300-09 NE BASIN SDHM1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      47
      IMPLND       1
      GENER        2
      RCHRES       1
      RCHRES       2
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Surface Biofilter  1        MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
    2        24
  END OPCODE
  PARM
    #    #         K ***
    2             0.
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   47      D,Urban,Moderate       1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   47         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   47         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   47         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   47              0       3.5     0.025        50       0.1       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   47              0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   47              0       0.6      0.03         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   47       0.6  0.6  0.6  0.6  0.7  0.7  0.7  0.7  0.7  0.6  0.6  0.6
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   47       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   47              0         0      0.15         0         1      0.05         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO
```

```
  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1           100      0.05     0.011       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1             0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  47                       2.36     RCHRES   1      2
PERLND  47                       2.36     RCHRES   1      3
IMPLND   1                      5.909     RCHRES   1      5

******Routing******
PERLND  47                       2.36     COPY     1     12
IMPLND   1                      5.909     COPY     1     15
PERLND  47                       2.36     COPY     1     13
RCHRES   1                          1     RCHRES   2      8
RCHRES   2                          1     COPY   501     16
RCHRES   1                          1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
GENER    2 OUTPUT TIMSER      .0002778     RCHRES   1     EXTNL  OUTDGT 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                             ***
    1     Surface Biofilte-004    3    1    1    1   28    0    1
    2     Biofilter  1            1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
```

```
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
    1        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR      KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->      ***
    1              1      0.01       0.0       0.0       0.5       0.0
    2              2      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <--><--><--><--><--> *** <--><--><--><--><--><--><-->
    1           0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
*** User-Defined Variable Quantity Lines
***                          addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol2   RCHRES   2 VOL             4
  UVQUAN v2m2   GLOBAL     WORKSP  1        3
  UVQUAN vpo2   GLOBAL     WORKSP  2        3
  UVQUAN v2d2   GENER    2 K       1        3
*** User-Defined Target Variable Names
***                  addr or                       addr or
***                 <------>                      <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper     vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->    <----><-><-><-> <---> <-->
  UVNAME  v2m2    1 WORKSP  1         1.0 QUAN
  UVNAME  vpo2    1 WORKSP  2         1.0 QUAN
  UVNAME  v2d2    1 K       1         1.0 QUAN
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   2                               v2m2           =  19311.
*** Compute remaining available pore space
  GENER   2                               vpo2           =  v2m2
  GENER   2                               vpo2          -=  vol2
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo2 < 0.0) THEN
  GENER   2                               vpo2           =  0.0
END IF
*** Infiltration volume
  GENER   2                               v2d2           =  vpo2
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   60    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
```

```
  0.000000  0.274472  0.000000  0.000000
  0.093407  0.272809  0.004910  0.000000
  0.186813  0.270931  0.009863  0.001288
  0.280220  0.269060  0.014858  0.004430
  0.373626  0.267194  0.019897  0.007122
  0.467033  0.265335  0.024978  0.009015
  0.560440  0.263483  0.030102  0.010560
  0.653846  0.261637  0.035270  0.011899
  0.747253  0.259797  0.040482  0.013098
  0.840659  0.257964  0.045737  0.014192
  0.934066  0.256137  0.051036  0.015206
  1.027473  0.254316  0.056379  0.016155
  1.120879  0.252502  0.061766  0.017050
  1.214286  0.250695  0.067198  0.017899
  1.307692  0.248894  0.072675  0.018709
  1.401099  0.247099  0.078196  0.019485
  1.494505  0.245310  0.083762  0.020231
  1.587912  0.243528  0.091525  0.020949
  1.681319  0.241753  0.099350  0.021644
  1.774725  0.239984  0.107239  0.022317
  1.868132  0.238221  0.115190  0.022969
  1.961538  0.236464  0.123205  0.023604
  2.054945  0.234714  0.131284  0.024221
  2.148352  0.232971  0.139427  0.024823
  2.241758  0.231234  0.147634  0.025411
  2.335165  0.229503  0.155905  0.025985
  2.428571  0.227779  0.164241  0.026547
  2.521978  0.226061  0.172642  0.027097
  2.615385  0.224349  0.181109  0.027636
  2.708791  0.222644  0.189641  0.028165
  2.802198  0.220946  0.198238  0.028684
  2.895604  0.219253  0.206902  0.029635
  2.989011  0.217567  0.215632  0.030614
  3.082418  0.215888  0.224428  0.031562
  3.175824  0.214215  0.233291  0.032483
  3.269231  0.212548  0.242221  0.033378
  3.362637  0.210888  0.251218  0.034249
  3.456044  0.209234  0.260283  0.035099
  3.549451  0.207587  0.269415  0.035928
  3.642857  0.205946  0.278615  0.036739
  3.736264  0.204311  0.287884  0.037533
  3.829670  0.202683  0.297221  0.038310
  3.923077  0.201061  0.306626  0.039071
  4.016484  0.199446  0.316101  0.039818
  4.109890  0.197837  0.325645  0.040551
  4.203297  0.196235  0.335258  0.041272
  4.296703  0.194638  0.344941  0.041980
  4.390110  0.193049  0.354694  0.042676
  4.483516  0.191465  0.364517  0.043361
  4.576923  0.189888  0.374411  0.044036
  4.670330  0.188318  0.384375  0.044701
  4.763736  0.186754  0.394410  0.045357
  4.857143  0.185196  0.404516  0.046003
  4.950549  0.183645  0.414694  0.046641
  5.043956  0.182100  0.424944  0.047271
  5.137363  0.180562  0.435265  0.047894
  5.230769  0.179030  0.445659  0.048510
  5.324176  0.177504  0.456125  0.049123
  5.417582  0.175985  0.466663  0.049739
  5.500000  0.174472  0.999648  0.050384
  END FTABLE  2
  FTABLE      1
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.174472  0.000000  0.000000  0.000000  0.000000
  0.093407  0.276362  0.025726  0.000000  0.934406  0.000000
  0.186813  0.278259  0.051628  0.000000  0.989181  0.000000
```

```
  0.280220  0.280162  0.077708  0.000000  1.043957  0.000000
  0.373626  0.282071  0.103967  0.000000  1.098732  0.000000
  0.467033  0.283987  0.130403  0.000000  1.153508  0.000000
  0.560440  0.285909  0.157019  0.000000  1.208283  0.000000
  0.653846  0.287838  0.183815  0.000000  1.263059  0.000000
  0.747253  0.289773  0.210792  0.000000  1.317834  0.000000
  0.840659  0.291715  0.237949  0.000000  1.372610  0.000000
  0.934066  0.293662  0.265288  0.000000  1.427385  0.000000
  1.027473  0.295617  0.292809  0.000000  1.482161  0.000000
  1.120879  0.297577  0.320514  0.000000  1.536937  0.000000
  1.214286  0.299545  0.348401  0.000000  1.591712  0.000000
  1.307692  0.301518  0.376473  0.000000  1.646488  0.000000
  1.401099  0.303498  0.404729  0.000000  1.701263  0.000000
  1.494505  0.305484  0.433170  0.000000  1.756039  0.000000
  1.587912  0.307477  0.461798  0.000000  1.810814  0.000000
  1.681319  0.309476  0.490612  0.000000  1.865590  0.000000
  1.774725  0.311482  0.519612  0.000000  1.920365  0.000000
  1.868132  0.313494  0.548801  0.000000  1.975141  0.000000
  1.961538  0.315512  0.578177  0.000000  2.029916  0.000000
  2.054945  0.317537  0.607743  0.136453  2.084692  0.000000
  2.148352  0.319568  0.637498  0.595207  2.139467  0.000000
  2.241758  0.321606  0.667443  1.167052  2.194243  0.000000
  2.335165  0.323650  0.697578  1.692395  2.249018  0.000000
  2.428571  0.325700  0.727905  2.047214  2.303794  0.000000
  2.521978  0.327757  0.758424  2.275546  2.358569  0.000000
  2.615385  0.329821  0.789135  2.470773  2.413345  0.000000
  2.708791  0.331890  0.820039  2.651665  2.468120  0.000000
  2.802198  0.333966  0.851137  2.820982  2.522896  0.000000
  2.895604  0.336049  0.882429  2.980696  2.577671  0.000000
  2.989011  0.338138  0.913915  3.132277  2.632447  0.000000
  3.000000  0.338384  0.917632  3.276853  2.638891  0.000000
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
WDM     22 IRRG     ENGL    0.7       SAME PERLND  47     EXTNL  SURLI
WDM      2 PREC     ENGL    1              RCHRES   1     EXTNL  PREC
WDM      1 EVAP     ENGL    0.5            RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   2     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1002 STAG     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     12.1      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3
```

```
  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        8
RCHRES     OFLOW  OVOL   2                RCHRES         INFLOW IVOL
  END MASS-LINK    8

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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SDHM 3.1

PROJECT REPORT

General Model Information

Project Name:	L300-09 SE BASIN SDHM
Site Name:	Sunrise
Site Address:	
City:	San Marcos
Report Date:	4/4/2018
Gage:	BONITA
Data Start:	10/01/1971
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2018/01/19

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Moderate	4.842
Pervious Total	4.842
Impervious Land Use	acre
Impervious Total	0
Basin Total	4.842

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Urban,Moderate	1.5898
Pervious Total	1.5898

Impervious Land Use	acre
IMPERVIOUS-FLAT	3.1374
Impervious Total	3.1374
Basin Total	4.7272

Element Flows To:

Surface	Interflow	Groundwater
Surface Biofilter 1	Surface Biofilter 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Biofilter 1

Bottom Length:	100.00 ft.
Bottom Width:	50.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	ESM
Material thickness of second layer:	4
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.96103563264
Offset (in.):	0
Flow Through Underdrain (ac-ft.):	61.249
Total Outflow (ac-ft.):	63.42
Percent Through Underdrain:	96.58
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.2017	0.0000	0.0000	0.0000
0.0934	0.2002	0.0032	0.0000	0.0000
0.1868	0.1985	0.0065	0.0008	0.0000
0.2802	0.1969	0.0098	0.0036	0.0000
0.3736	0.1952	0.0132	0.0080	0.0000
0.4670	0.1936	0.0165	0.0090	0.0000
0.5604	0.1920	0.0200	0.0106	0.0000
0.6538	0.1904	0.0234	0.0119	0.0000
0.7473	0.1887	0.0269	0.0131	0.0000
0.8407	0.1871	0.0304	0.0142	0.0000
0.9341	0.1855	0.0340	0.0152	0.0000
1.0275	0.1839	0.0376	0.0162	0.0000
1.1209	0.1823	0.0412	0.0170	0.0000
1.2143	0.1807	0.0449	0.0179	0.0000
1.3077	0.1792	0.0486	0.0187	0.0000
1.4011	0.1776	0.0524	0.0195	0.0000
1.4945	0.1760	0.0562	0.0202	0.0000
1.5879	0.1745	0.0615	0.0209	0.0000
1.6813	0.1729	0.0669	0.0216	0.0000
1.7747	0.1714	0.0723	0.0223	0.0000
1.8681	0.1698	0.0778	0.0230	0.0000
1.9615	0.1683	0.0833	0.0236	0.0000
2.0549	0.1668	0.0889	0.0242	0.0000
2.1484	0.1653	0.0945	0.0248	0.0000
2.2418	0.1637	0.1002	0.0254	0.0000
2.3352	0.1622	0.1059	0.0260	0.0000
2.4286	0.1607	0.1117	0.0265	0.0000
2.5220	0.1592	0.1176	0.0271	0.0000
2.6154	0.1577	0.1235	0.0276	0.0000

2.7088	0.1563	0.1295	0.0282	0.0000
2.8022	0.1548	0.1355	0.0287	0.0000
2.8956	0.1533	0.1416	0.0296	0.0000
2.9890	0.1519	0.1477	0.0306	0.0000
3.0824	0.1504	0.1539	0.0316	0.0000
3.1758	0.1490	0.1602	0.0325	0.0000
3.2692	0.1475	0.1665	0.0334	0.0000
3.3626	0.1461	0.1729	0.0342	0.0000
3.4560	0.1446	0.1793	0.0351	0.0000
3.5495	0.1432	0.1858	0.0359	0.0000
3.6429	0.1418	0.1924	0.0367	0.0000
3.7363	0.1404	0.1990	0.0375	0.0000
3.8297	0.1390	0.2057	0.0383	0.0000
3.9231	0.1376	0.2124	0.0391	0.0000
4.0165	0.1362	0.2192	0.0398	0.0000
4.1099	0.1348	0.2260	0.0406	0.0000
4.2033	0.1334	0.2330	0.0413	0.0000
4.2967	0.1321	0.2399	0.0420	0.0000
4.3901	0.1307	0.2470	0.0427	0.0000
4.4835	0.1293	0.2541	0.0434	0.0000
4.5769	0.1280	0.2612	0.0440	0.0000
4.6703	0.1266	0.2684	0.0447	0.0000
4.7637	0.1253	0.2757	0.0454	0.0000
4.8571	0.1239	0.2831	0.0460	0.0000
4.9505	0.1226	0.2905	0.0466	0.0000
5.0440	0.1213	0.2980	0.0473	0.0000
5.1374	0.1200	0.3055	0.0479	0.0000
5.2308	0.1187	0.3131	0.0485	0.0000
5.3242	0.1174	0.3208	0.0491	0.0000
5.4176	0.1161	0.3285	0.0497	0.0000
5.5000	0.1148	0.3354	0.0504	0.0000

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
5.5000	0.2017	0.3354	0.0000	0.6147	0.0000
5.5934	0.2033	0.3543	0.0000	0.6147	0.0000
5.6868	0.2050	0.3733	0.0000	0.6508	0.0000
5.7802	0.2067	0.3926	0.0000	0.6868	0.0000
5.8736	0.2084	0.4120	0.0000	0.7229	0.0000
5.9670	0.2101	0.4315	0.0000	0.7589	0.0000
6.0604	0.2118	0.4512	0.0000	0.7949	0.0000
6.1538	0.2135	0.4711	0.0000	0.8310	0.0000
6.2473	0.2152	0.4911	0.0000	0.8670	0.0000
6.3407	0.2169	0.5113	0.0000	0.9030	0.0000
6.4341	0.2186	0.5316	0.0000	0.9391	0.0000
6.5275	0.2203	0.5521	0.0000	0.9751	0.0000
6.6209	0.2221	0.5728	0.0000	1.0111	0.0000
6.7143	0.2238	0.5936	0.0000	1.0472	0.0000
6.8077	0.2256	0.6146	0.0000	1.0832	0.0000
6.9011	0.2273	0.6357	0.0000	1.1193	0.0000
6.9945	0.2291	0.6570	0.0000	1.1553	0.0000
7.0879	0.2309	0.6785	0.0000	1.1913	0.0000
7.1813	0.2326	0.7002	0.0000	1.2274	0.0000
7.2747	0.2344	0.7220	0.0000	1.2634	0.0000
7.3681	0.2362	0.7440	0.0000	1.2994	0.0000
7.4615	0.2380	0.7661	0.0000	1.3355	0.0000
7.5549	0.2398	0.7884	0.1365	1.3715	0.0000
7.6484	0.2416	0.8109	0.5952	1.4075	0.0000

7.7418	0.2434	0.8336	1.1671	1.4436	0.0000
7.8352	0.2453	0.8564	1.6924	1.4796	0.0000
7.9286	0.2471	0.8794	2.0472	1.5157	0.0000
8.0220	0.2489	0.9025	2.2755	1.5517	0.0000
8.1154	0.2508	0.9259	2.4708	1.5877	0.0000
8.2088	0.2526	0.9494	2.6517	1.6238	0.0000
8.3022	0.2545	0.9731	2.8210	1.6598	0.0000
8.3956	0.2563	0.9969	2.9807	1.6958	0.0000
8.4890	0.2582	1.0210	3.1323	1.7319	0.0000
8.5000	0.2584	1.0238	3.2769	1.7361	0.0000

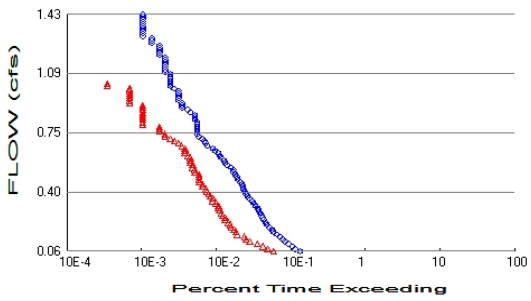
Surface Biofilter 1

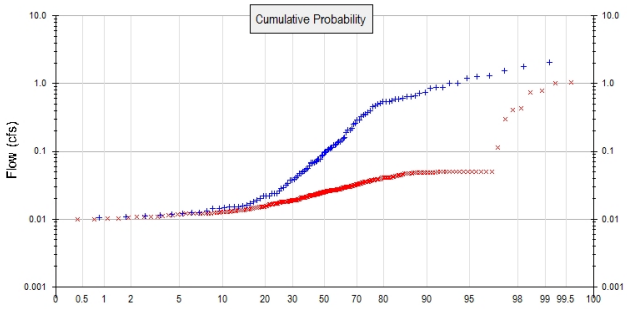
Element Flows To:

Outlet 1	Outlet 2
	Biofilter 1

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 4.842
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.5898
Total Impervious Area: 3.1374

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.607926
5 year	1.035323
10 year	1.430807
25 year	1.898172

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.049743
5 year	0.315105
10 year	0.767639
25 year	1.019415

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0608	386	171	44	Pass
0.0746	331	141	42	Pass
0.0885	303	124	40	Pass
0.1023	269	103	38	Pass
0.1161	241	82	34	Pass
0.1300	227	73	32	Pass
0.1438	208	69	33	Pass
0.1577	189	56	29	Pass
0.1715	168	53	31	Pass
0.1853	163	50	30	Pass
0.1992	148	46	31	Pass
0.2130	139	45	32	Pass
0.2269	134	42	31	Pass
0.2407	126	38	30	Pass
0.2545	122	38	31	Pass
0.2684	116	35	30	Pass
0.2822	112	34	30	Pass
0.2960	108	32	29	Pass
0.3099	104	31	29	Pass
0.3237	97	31	31	Pass
0.3376	91	29	31	Pass
0.3514	89	26	29	Pass
0.3652	81	26	32	Pass
0.3791	76	24	31	Pass
0.3929	73	23	31	Pass
0.4068	69	22	31	Pass
0.4206	67	21	31	Pass
0.4344	66	19	28	Pass
0.4483	64	19	29	Pass
0.4621	61	17	27	Pass
0.4759	57	17	29	Pass
0.4898	55	17	30	Pass
0.5036	52	17	32	Pass
0.5175	49	15	30	Pass
0.5313	49	15	30	Pass
0.5451	46	14	30	Pass
0.5590	40	14	35	Pass
0.5728	38	13	34	Pass
0.5867	37	13	35	Pass
0.6005	34	13	38	Pass
0.6143	33	12	36	Pass
0.6282	31	11	35	Pass
0.6420	28	11	39	Pass
0.6558	26	11	42	Pass
0.6697	22	10	45	Pass
0.6835	21	9	42	Pass
0.6974	20	8	40	Pass
0.7112	19	7	36	Pass
0.7250	17	6	35	Pass
0.7389	16	6	37	Pass
0.7527	16	5	31	Pass
0.7666	16	5	31	Pass
0.7804	16	5	31	Pass

0.7942	16	3	18	Pass
0.8081	16	3	18	Pass
0.8219	15	3	20	Pass
0.8358	15	3	20	Pass
0.8496	15	3	20	Pass
0.8634	13	3	23	Pass
0.8773	12	3	25	Pass
0.8911	10	3	30	Pass
0.9049	10	3	30	Pass
0.9188	10	2	20	Pass
0.9326	9	2	22	Pass
0.9465	9	2	22	Pass
0.9603	9	2	22	Pass
0.9741	9	2	22	Pass
0.9880	9	2	22	Pass
1.0018	8	2	25	Pass
1.0157	7	1	14	Pass
1.0295	7	1	14	Pass
1.0433	7	0	0	Pass
1.0572	7	0	0	Pass
1.0710	7	0	0	Pass
1.0848	7	0	0	Pass
1.0987	6	0	0	Pass
1.1125	6	0	0	Pass
1.1264	6	0	0	Pass
1.1402	6	0	0	Pass
1.1540	6	0	0	Pass
1.1679	6	0	0	Pass
1.1817	6	0	0	Pass
1.1956	5	0	0	Pass
1.2094	5	0	0	Pass
1.2232	5	0	0	Pass
1.2371	5	0	0	Pass
1.2509	5	0	0	Pass
1.2647	4	0	0	Pass
1.2786	4	0	0	Pass
1.2924	4	0	0	Pass
1.3063	3	0	0	Pass
1.3201	3	0	0	Pass
1.3339	3	0	0	Pass
1.3478	3	0	0	Pass
1.3616	3	0	0	Pass
1.3755	3	0	0	Pass
1.3893	3	0	0	Pass
1.4031	3	0	0	Pass
1.4170	3	0	0	Pass
1.4308	3	0	0	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

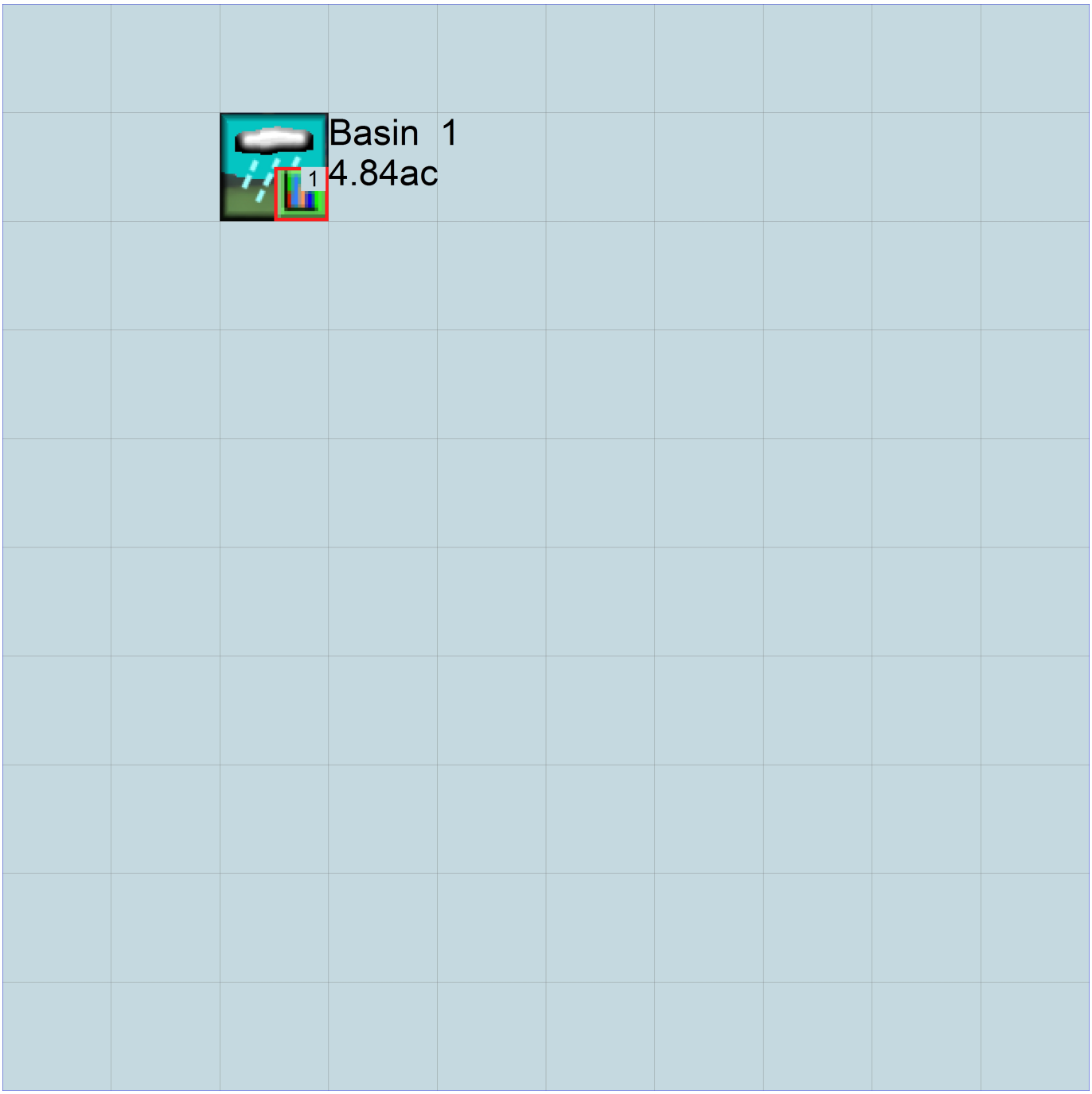
PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic

Predeveloped UCI File

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1971 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   L300-09 SE BASIN SDHM.wdm
MESSU       25   MitL300-09 SE BASIN SDHM.MES
            27   MitL300-09 SE BASIN SDHM.L61
            28   MitL300-09 SE BASIN SDHM.L62
            30   POCL300-09 SE BASIN SDHM1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      47
      IMPLND       1
      GENER        2
      RCHRES       1
      RCHRES       2
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Surface Biofilter  1        MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
    2        24
  END OPCODE
  PARM
    #    #         K ***
    2             0.
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   47      D,Urban,Moderate       1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   47         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   47         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   47         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   47              0       3.5     0.025        50       0.1       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   47              0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                 ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   47              0       0.6      0.03         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   47       0.6  0.6  0.6  0.6  0.7  0.7  0.7  0.7  0.7  0.6  0.6  0.6
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   47       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   47              0         0      0.15         0         1      0.05         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO
```

```
  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1           100      0.05     0.011       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1             0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  47                      1.5898     RCHRES   1      2
PERLND  47                      1.5898     RCHRES   1      3
IMPLND   1                      3.1374     RCHRES   1      5

******Routing******
PERLND  47                      1.5898     COPY     1     12
IMPLND   1                      3.1374     COPY     1     15
PERLND  47                      1.5898     COPY     1     13
RCHRES   1                           1     RCHRES   2      8
RCHRES   2                           1     COPY   501     16
RCHRES   1                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
GENER    2 OUTPUT TIMSER      .0002778     RCHRES   1     EXTNL  OUTDGT 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                             ***
    1     Surface Biofilte-004    3    1    1    1   28    0    1
    2     Biofilter  1            1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
```

```
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
    1        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR      KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->      ***
    1              1      0.01       0.0       0.0       0.5       0.0
    2              2      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <--><--><--><--><--> *** <--><--><--><--><--><--><-->
    1           0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
*** User-Defined Variable Quantity Lines
***                          addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol2   RCHRES   2 VOL             4
  UVQUAN v2m2   GLOBAL     WORKSP  1        3
  UVQUAN vpo2   GLOBAL     WORKSP  2        3
  UVQUAN v2d2   GENER    2 K       1        3
*** User-Defined Target Variable Names
***                  addr or                       addr or
***                 <------>                      <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper     vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->    <----><-><-><-> <---> <-->
  UVNAME  v2m2    1 WORKSP  1         1.0 QUAN
  UVNAME  vpo2    1 WORKSP  2         1.0 QUAN
  UVNAME  v2d2    1 K       1         1.0 QUAN
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   2                               v2m2           =  13594.
*** Compute remaining available pore space
  GENER   2                               vpo2           =  v2m2
  GENER   2                               vpo2          -=  vol2
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo2 < 0.0) THEN
  GENER   2                               vpo2           =  0.0
END IF
*** Infiltration volume
  GENER   2                               v2d2           =  vpo2
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   60    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
```

```
  0.000000  0.201653  0.000000  0.000000
  0.093407  0.200187  0.003235  0.000000
  0.186813  0.198532  0.006505  0.000847
  0.280220  0.196883  0.009813  0.003621
  0.373626  0.195241  0.013156  0.007968
  0.467033  0.193605  0.016537  0.009015
  0.560440  0.191976  0.019954  0.010560
  0.653846  0.190353  0.023409  0.011899
  0.747253  0.188736  0.026901  0.013098
  0.840659  0.187126  0.030430  0.014192
  0.934066  0.185522  0.033998  0.015206
  1.027473  0.183924  0.037602  0.016155
  1.120879  0.182333  0.041245  0.017050
  1.214286  0.180749  0.044927  0.017899
  1.307692  0.179170  0.048646  0.018709
  1.401099  0.177599  0.052404  0.019485
  1.494505  0.176033  0.056201  0.020231
  1.587912  0.174474  0.061508  0.020949
  1.681319  0.172922  0.066868  0.021644
  1.774725  0.171375  0.072283  0.022317
  1.868132  0.169836  0.077752  0.022969
  1.961538  0.168302  0.083276  0.023604
  2.054945  0.166775  0.088855  0.024221
  2.148352  0.165255  0.094490  0.024823
  2.241758  0.163741  0.100180  0.025411
  2.335165  0.162233  0.105926  0.025985
  2.428571  0.160732  0.111728  0.026547
  2.521978  0.159237  0.117586  0.027097
  2.615385  0.157748  0.123501  0.027636
  2.708791  0.156266  0.129473  0.028165
  2.802198  0.154791  0.135502  0.028684
  2.895604  0.153321  0.141588  0.029635
  2.989011  0.151858  0.147732  0.030614
  3.082418  0.150402  0.153933  0.031562
  3.175824  0.148952  0.160193  0.032483
  3.269231  0.147508  0.166511  0.033378
  3.362637  0.146071  0.172887  0.034249
  3.456044  0.144640  0.179323  0.035099
  3.549451  0.143216  0.185817  0.035928
  3.642857  0.141798  0.192371  0.036739
  3.736264  0.140386  0.198984  0.037533
  3.829670  0.138981  0.205657  0.038310
  3.923077  0.137582  0.212391  0.039071
  4.016484  0.136190  0.219184  0.039818
  4.109890  0.134804  0.226038  0.040551
  4.203297  0.133425  0.232953  0.041272
  4.296703  0.132051  0.239929  0.041980
  4.390110  0.130685  0.246966  0.042676
  4.483516  0.129324  0.254065  0.043361
  4.576923  0.127971  0.261225  0.044036
  4.670330  0.126623  0.268448  0.044701
  4.763736  0.125282  0.275733  0.045357
  4.857143  0.123947  0.283080  0.046003
  4.950549  0.122619  0.290490  0.046641
  5.043956  0.121297  0.297964  0.047271
  5.137363  0.119982  0.305500  0.047894
  5.230769  0.118673  0.313100  0.048510
  5.324176  0.117370  0.320764  0.049123
  5.417582  0.116074  0.328492  0.049739
  5.500000  0.114784  0.704265  0.050384
  END FTABLE  2
  FTABLE      1
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.114784  0.000000  0.000000  0.000000  0.000000
  0.093407  0.203320  0.018914  0.000000  0.614741  0.000000
  0.186813  0.204994  0.037983  0.000000  0.650777  0.000000
```

```
  0.280220  0.206674  0.057209  0.000000  0.686814  0.000000
  0.373626  0.208360  0.076593  0.000000  0.722850  0.000000
  0.467033  0.210053  0.096134  0.000000  0.758887  0.000000
  0.560440  0.211752  0.115834  0.000000  0.794923  0.000000
  0.653846  0.213458  0.135693  0.000000  0.830960  0.000000
  0.747253  0.215170  0.155711  0.000000  0.866996  0.000000
  0.840659  0.216888  0.175889  0.000000  0.903033  0.000000
  0.934066  0.218613  0.196229  0.000000  0.939069  0.000000
  1.027473  0.220345  0.216730  0.000000  0.975106  0.000000
  1.120879  0.222082  0.237392  0.000000  1.011142  0.000000
  1.214286  0.223826  0.258218  0.000000  1.047179  0.000000
  1.307692  0.225577  0.279206  0.000000  1.083215  0.000000
  1.401099  0.227334  0.300359  0.000000  1.119252  0.000000
  1.494505  0.229097  0.321676  0.000000  1.155289  0.000000
  1.587912  0.230867  0.343157  0.000000  1.191325  0.000000
  1.681319  0.232643  0.364805  0.000000  1.227362  0.000000
  1.774725  0.234426  0.386619  0.000000  1.263398  0.000000
  1.868132  0.236215  0.408599  0.000000  1.299435  0.000000
  1.961538  0.238010  0.430747  0.000000  1.335471  0.000000
  2.054945  0.239812  0.453063  0.136453  1.371508  0.000000
  2.148352  0.241620  0.475547  0.595207  1.407544  0.000000
  2.241758  0.243435  0.498201  1.167052  1.443581  0.000000
  2.335165  0.245256  0.521024  1.692395  1.479617  0.000000
  2.428571  0.247083  0.544018  2.047214  1.515654  0.000000
  2.521978  0.248917  0.567183  2.275546  1.551690  0.000000
  2.615385  0.250757  0.590519  2.470773  1.587727  0.000000
  2.708791  0.252604  0.614028  2.651665  1.623763  0.000000
  2.802198  0.254457  0.637709  2.820982  1.659800  0.000000
  2.895604  0.256316  0.661564  2.980696  1.695836  0.000000
  2.989011  0.258182  0.685593  3.132277  1.731873  0.000000
  3.000000  0.258402  0.688431  3.276853  1.736113  0.000000
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
WDM     22 IRRG     ENGL    0.7       SAME PERLND  47     EXTNL  SURLI
WDM      2 PREC     ENGL    1              RCHRES   1     EXTNL  PREC
WDM      1 EVAP     ENGL    0.5            RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   2     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1002 STAG     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     12.1      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3
```

```
  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        8
RCHRES     OFLOW  OVOL   2                RCHRES         INFLOW IVOL
  END MASS-LINK    8

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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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 Thresholds and Actions (Required)	☐ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Maintenance Agreement (when applicable)	☐ Included ☐ Not Applicable

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

☐ **Preliminary Design / Planning / CEQA level submittal:**

Attachment 3a must identify:

☐ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

☐ **Final Design level submittal:**

Attachment 3a must identify:

☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP 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 private entity operation and maintenance, Attachment 3b shall include a draft maintenance agreement in the local jurisdiction's standard format (PDP applicant to contact the [City Engineer] to obtain the current maintenance agreement forms).

ATTACHMENT 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

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 Form I-6 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 the [City Engineer]
- ☐ 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 shall be provided. Photocopies of general brochures are not acceptable.