CITY OF CHULA VISTA

PDP SWQMP

PRIORITY DEVELOPMENT PROJECT (PDP)
STORM WATER QUALITY MANAGEMENT PLAN
FOR
EASTLAKE BEHAVIORAL HEALTH HOSPITAL

595-710-11,12
DR 19-0012, CUP 19-0010, PER 19-0006
Insert Drawing Number

ENGINEER OF WORK:

8/2/2019
Kamal S. Sweis P.E. 48592

PREPARED FOR:
Acadia Health Care
6100 Tower Circle, Suite 1000
Franklin, TN 91914 370067
Insert Telephone Number

REGISTERED PROFESSIONAL ENGINEER
KAMAL S. SWEIS
No. 48592
EXP. 6/30/2020
CIVIL
STATE OF CALIFORNIA

PREPARED BY:
K&S ENGINEERING, INC.
Planning Engineering Surveying

7801 Mission Center Court, Suite 100
San Diego, CA 92108
(619)296-5565

DATE: 08/01/2019

Approved By: City of Chula Vista **Date:**

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TABLE OF CONTENTS

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

CERTIFICATION PAGE

Project Name: EASTLAKE BEHAVIORAL HEALTH HOSPITAL
Permit Application Number: DR 19-0012, CUP 19-0010, PER 19-0006

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of Chula Vista BMP Design Manual, which is based on the requirements of the San Diego Regional Water Quality Control Board Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

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, PE Number & Expiration Date

KAMAL SWEIS

Print Name

K & S ENGINEERING INC.

Company

2/26/19

Date

Engineer's Seal

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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	02/28/2019	☒ Preliminary Design/ Planning/ CEQA ☐ Final Design	Click here to enter text.
2	08/05/2019	☒ Preliminary Design/ Planning/ CEQA ☐ Final Design	Resubmittal
3	Click here to enter a date.	☐ Preliminary Design/ Planning/ CEQA ☐ Final Design	Click here to enter text.
4	Click here to enter a date.	☐Preliminary Design/ Planning/ CEQA ☐Final Design	Click here to enter text.

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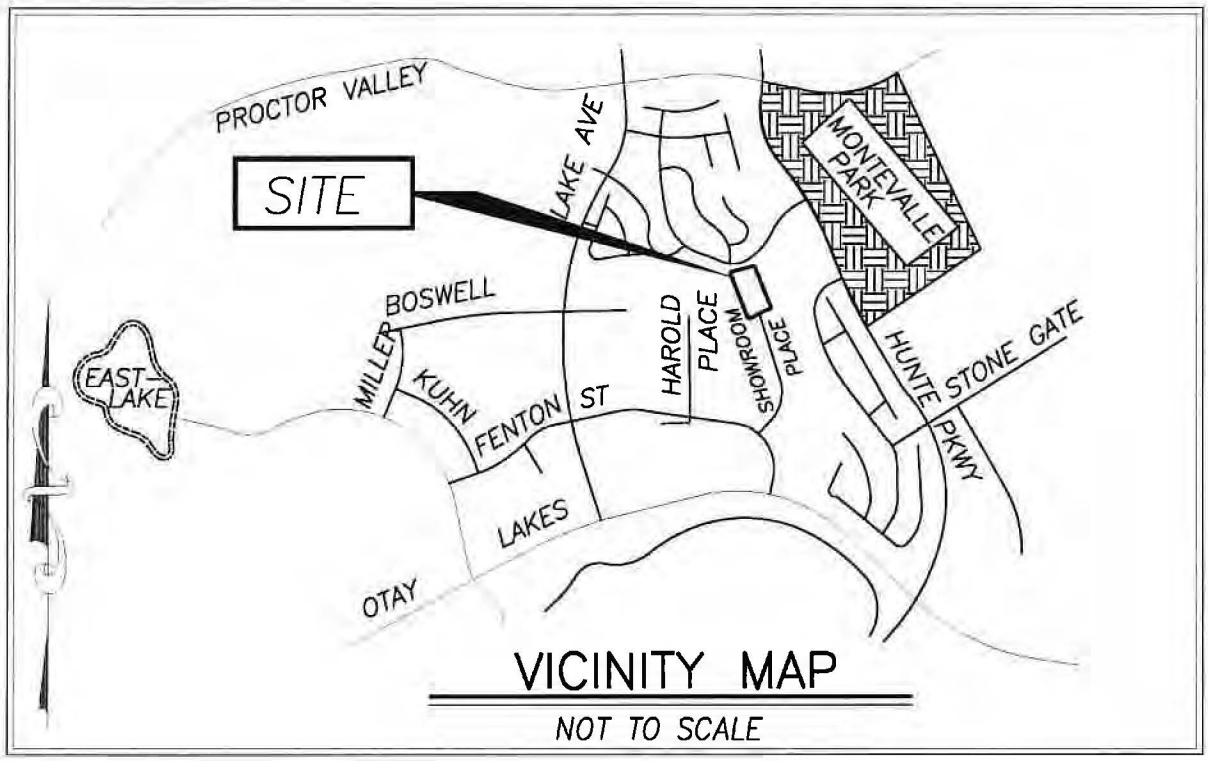
PROJECT VICINITY MAP

Project Name: EASTLAKE BEHAVIORAL HEALTH HOSPITAL
Permit Application Number: DR 19-0012, CUP 19-0010, PER 19-0006



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Complete and attach Storm Water Requirements Applicability Checklist (Intake Form) included in Appendix A.1

Storm Water Requirements Applicability Checklist (Intake Form) for All Permit Applications

Public Works Department - Storm Water Management Section — April 2016

Project Information

Project Address: 830, 831 Showroom Place Chula Vista	Project Application Number: DR 19-0012, CUP 19-0010, PER 19-0006
Project Name: EASTLAKE BEHAVIORAL HEALTH HOSPITAL	APN(s) 561-710-11,12
Brief Description of Work Proposed: Grading and Drainage	

Owner/Contact Information

Name of Person Completing this Form: Kamal Sweis

Role: ☐ Property Owner ☐ Contractor ☐ Architect ☒ Engineer ☐ Other _____

Email: kss@ks-engr.com Phone: (619)296-5565

Signature: Date Completed: Feb 28, 2019

Answer each section below, starting with Section 1 and progressing through each section. Additional information for determining the requirements is found in the Chula Vista BMP Design Manual available on the City's website at http://www.chulavistaca.gov/departments/public-works/services/storm-water-pollution-prevention/documents-and-reports.

SECTION 1: Storm Water BMP Requirements

Does the project consist of one or both of the following: • Repair or improvements to an existing building or structure that donot alter the size such as: tenant improvements, interior remodeling, electrical work, fire alarm, fire sprinkler system, HVAC work, Gas, plumbing, etc. • Routine maintenance activities such as: roof or exterior structure surface replacement; resurfacing existing roadways and parking lots including digouts, slurry seal, overlay and restriping; repair damaged sidewalks or pedestrian ramps on existing roads without expanding the impervious footprint; routine replacement of damaged pavement, trenching and resurfacing associated with utility work (i.e. sewer, water, gas or electrical laterals, etc.) and pot holing or geotechnical investigation borings.	☐ Yes	Project is **NOT** Subject to Permanent Storm Water BMP requirements, **BUT IS** subject to Construction BMP requirements. Review & sign "Construction Storm Water BMP Certification Statement" on page 2.
	☒ No	Continue to Section 2, page3.

Construction Storm Water BMP Certification Statement

The following stormwater quality protection measures are required by City Chula Vista Municipal Code Chapter 14.20 and the City's Jurisdictional Runoff Management Program.

1. All applicable construction BMPs and non-stormwater discharge BMPs shall be installed and maintained for the duration of the project in accordance with the Appendix K "Construction BMP Standards" of the Chula Vista BMP Design Manual.
2. Erosion control BMPs shall be implemented for all portions of the project area in which no work has been done or is planned to be done over a period of 14 or more days. All onsite drainage pathways that convey concentrated flows shall be stabilized to prevent erosion.
3. Run-on from areas outside the project area shall be diverted around work areas to the extent feasible. Run-on that cannot be diverted shall be managed using appropriate erosion and sediment control BMPs.
4. Sediment control BMPs shall be implemented, including providing fiber rolls, gravel bags, or other equally effective BMPs around the perimeter of the project to prevent transport of soil and sediment offsite. Any sediment tracked onto offsite paved areas shall be removed via sweeping at least daily.
5. Trash and other construction wastes shall be placed in a designated area at least daily and shall be disposed of in accordance with applicable requirements.
6. Materials shall be stored to avoid being transported in storm water runoff and non-storm water discharges. Concrete washout shall be directed to a washout area and shall not be washed out to the ground.
7. Stockpiles and other sources of pollutants shall be covered when the chance of rain within the next 48 hours is at least 50%.

I certify that the stormwater quality protection measures listed above will be implemented at the project described on Intake Form. I understand that failure to implement these measures may result in monetary penalties or other enforcement actions. This certification is signed under penalty of perjury and does not require notarization.

Name: KAMAL SWEIS Title: PRESIDENT

Signature: [signature] Date: 8/2/2019

Section 2: Determine if Project is a Standard Project or Priority Development Project

1. The project is (select one):

   ☒ New Development

   ☐ Redevelopment (is the creation and/or replacement of impervious surface on an already developed site)

2. Is the project in any of the following categories, (a) through (j)?

a. New development that creates 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 project that creates and/or replaces 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 development or redevelopment of a restaurant that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the entire project site). 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 Code 5812).	☐ Yes	☒ No
d. New development or redevelopment of hillside that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the entire project site). This category includes development on any natural slope that is twenty-five percent or greater.	☐ Yes	☒ No
e. New development or redevelopment of parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the entire project site). 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.	☒ Yes	☐ No
f. New development or redevelopment of Streets, roads, highways, freeways, and driveways that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the entire project site). This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles	☒ Yes	☐ No
g. New development or redevelopment project that creates and/or replaces 2,500 square feet or more of impervious surface (collectively over the entire project site), 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).	☐ Yes	☒ No
h. New development or redevelopment project of automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surface. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.	☐ Yes	☒ No
i. New development or redevelopment projects of retail gasoline outlets that creates and/or replaces 5,000 square feet or more of impervious surface or its projected Average Daily Traffic (ADT) of 100 or more vehicles per day.	☐ Yes	☒ No
j. New development or redevelopment that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.	☒ Yes	☐ No

The project is (select one):

☐ If "No" is checked for every category in Section 2, project is **"Standard Development Project"**. Site design and source control BMP requirements apply. Complete and submit Standard SWQMP (refer to Chapter 4 & Appendix E of the BMP Design Manual for guidance). **Continue to Section 4.**

☒ If "Yes" is checked for **ANY** category in Section 2, project is "**Priority Development Project (PDP)**". **Complete below, if applicable, and continue to Section 3.**

Complete for PDP Redevelopment Projects ONLY:

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

The total proposed newly created or replaced impervious area is 270494 ft^2 (B)

Percent impervious surface created or replaced (B/A)*100: 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 a PDP**

OR

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

Continue to Section 3

Section 3: Determine if project is PDP Exempt

1. Does the project ONLY include new or retrofit sidewalk, bicycle lane or trails that:
   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets or roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance?

   ☐ **Yes. Project is PDP Exempt.** Complete and submit Standard SWQMP (refer to Chapter 4 of the BMP Design Manual for guidance). **Continue to Section 4.**

   ☒ **No. Next question**

2. Does the project ONLY include retrofitting or redevelopment of existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets standards?

   ☐ **Yes. Project is PDP Exempt.** Complete and submit Standard SWQMP (refer to Chapter 4 of the BMP Design Manual for guidance). **Continue to Section 4.**

   ☒ **No. Project is PDP.** Site design, source control and structural pollutant control BMPs apply. Complete and submit PDP SWQMP (refer to Chapters 4, 5 & 6 of the BMP Design Manual for guidance). **Continue to Section 4.**

SECTION 4: Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the BMP Design Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP), which is administered by the State Water Resource Control Board.

1. Does the project include Building/Grading/Construction permits proposing less than 5,000 square feet of ground disturbance and has less than 5-foot elevation change over the entire project area?

   ☐ Yes; review & sign Construction Storm Water Certification Statement, skip questions 2-4 ☒ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing grading, grubbing, excavation, or other activity that results in ground disturbance of less than one acre and more than 5,000 square feet?

   ☐ Yes. complete & submit Construction Storm Water Pollution Control Plan (CSWPCP), skip questions 3-4 ☒ No; next question

3. Does the project results in disturbance of an acre or more of total land area and are considered regular maintenance projects performed to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as sewer/storm drain/utility replacement)

   ☐ Yes. complete & submit Construction Storm Water Pollution Control Plan (CSWPCP), skip question 4 ☒ No; next question

4. Is the project proposing land disturbance greater than or equal to one acre OR the project is part of a larger common plan of development disturbing 1 acre or more?

   ☒ Yes; Storm Water Pollution Prevention Plan (SWPPP) is required. Refer to online CASQA or Caltrans Template. Visit the SWRCB web site at http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.

Note: for Projects that result in disturbance of one to five acres of total land area and can demonstrate that there will be no adverse water quality impacts by applying for a Construction Rainfall Erosivity Waiver, may be allowed to submit a CSWPCP in lieu of a SWPPP.

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Site Information Checklist For PDPs	Form I-3B (for PDPs)
Project Summary Information	
Project Name	EASTLAKE BEHAVIORAL HEALTH HOSPITAL
Project Address	830, 831 SHOWROOM PLACE CHULA VISTA, CA
Assessor's Parcel Number(s) (APN(s))	595-710-11, 12
Permit Application Number	Click here to enter text.
Project Hydrologic Unit	Select One: ☐ Pueblo San Diego (908) ☒ Sweetwater (909) ☐ Otay (910) ☐ Tijuana (911)
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	909.110 Lower Sweetwater, Telegraph HSA
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	10.43 Acres (454,330 Square Feet)
Area to be Disturbed by the Project (Project Area)	9.82 Acres (427,759 Square Feet)
Project Proposed Impervious Area (subset of Project Area)	6.2 Acres (270,072 Square Feet)
Project Proposed Pervious Area (subset of Project Area)	4.18 Acres (182,080 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition.	60 %

Description of Existing Site Condition and Drainage Patterns

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:
Click here to enter text

Existing Land Cover Includes (select all that apply):

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

Description / Additional Information:
Click here to enter text.

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:
Click here to enter text

Description of Existing Site Topography and Drainage

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.

Description / Additional Information:

The site is mass graded and runoff sheetflows mildly into two existing desilting basins located at the south side of the site. One drains to an existing 24" storm drain pipe located within Showroom Place. The second desilting basin drains east to another existing 18" storm drain.The existing site generates Q50= 24.2 CFS. The calculated flows for existing condition are based on flat barren slopes runoff coefficient of C=0.65

Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:
The development consists of construction of one medical building with attached parking and landscaped areas including three biofiltration with partial retention facilities for water quality and flow control purposes. In general runoff from project will be directed into the proposed biofiltration basins underground storm drain pipes. After stormwater is treated and mitigated it will be conveyed to the two existing storm drain pipes mentioned before. Developed condition generates 42.1 CFS of runoff (undetained). The calculated flows for developed condition are based on Commercial site runoff coefficient of C=0.85

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
The project proposes impervious features such as: sidewalks, parking lot, drive aisles and one building which are approximately 70% of the site.

List/describe proposed pervious features of the project (e.g., landscape areas):
The project proposes previous features such as: landscaped areas and slopes and bioretention basins for approximately 30% of the site.

Does the project include grading and changes to site topography?

☒ Yes

☐ No

Description / Additional Information:

The propject proposes the precise grading for buildings, parking and landscape areas.

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 has two drainage basins. The westerly one drains to the south via an underground storm drain system a proposed biofiltration basin for water quality and HMP purposes and then conveyed to Showroom Place via an existing public 24" RCP storm drain. The easterly basin also drains to the south to a second biofiltration basin which drainage is intercepted and conveyed easterly by an existing private 18" RCP storm drain to Yosemitie Drive at the Eastlake III Woods. Developed condition generates cfs of runoff (undetained). The calculated flows for developed condition are based on Commercial site runoff coefficient of C=0.85

BASIN 1- PEAK FLOW TABLE (CFS) AT DETENTION BASIN

STORM EVENT	EXISTING CONDITION	PROPOSED CONDITION BEFORE DETENTION	PROPOSED CONDITION AFTER DETENTION
50-YEAR	13.4	24.5	10.7

BASIN 2- PEAK FLOW TABLE (CFS) AT DETENTION BASIN

STORM EVENT	EXISTING CONDITION	PROPOSED CONDITION BEFORE DETENTION	PROPOSED CONDITION AFTER DETENTION
50-YEAR	10.8	17.6	7.8

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:

Click here to enter text

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):
The project discharges into the MS4 located at Showroom Place, which inturn drains south into Fenton Street and into Telegraph Canyon Creek, then into the San Diego Bay and eventually into the Pacific Ocean.

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
San Diego Bay	PCBs	TMDL required
Telegraph Canyon Creek	Selenium	TMDL required
Click here to enter text	Click here to enter text.	Click here to enter text.

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 anticipated 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	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

Hydromodification Management Requirements

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):

Click here to enter text

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:

Click here to enter text

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 project consists of two POC's located at the project boundary which discharge to two different storm drain systems. POC#1 discharges to an existing storm drain pipe on Showroom Place while POC#2 discharges to second existing storm drain pipe which drains southwestery to the easterly property. No diversion of flow is proposed for these POC's.

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:

Click here to enter text

Discussion / Additional Information: (optional)

Click here to enter text

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.

None

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.

None

Source Control BMP Checklist for All Development Projects
(Standard Projects and PDPs)

Form I-4

Project Identification

Project Name: EASTLAKE BEHAVIORAL HEALTH HOSPITAL

Permit Application Number: DR 19-0012, CUP 19-0010, PER 19-0006

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 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 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: Click here to enter text			
SC-2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification if SC-2 not implemented: Click here to enter text			
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: The is no outdoor storage proposed.			
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: There are no materials stored outdoor			

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: Click here to enter text			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☐ Onsite storm drain inlets	☒Yes	☐No	☐N/A
☐ Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☐N/A
☐ Interior parking garages	☐Yes	☐No	☐N/A
☐ Need for future indoor & structural pest control	☐Yes	☐No	☐N/A
☐ Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☐ Pools, spas, ponds, decorative fountains, and other water features	☐Yes	☐No	☐N/A
☐ Food service	☒Yes	☐No	☐N/A
☐ Refuse areas	☐Yes	☐No	☐N/A
☐ Industrial processes	☐Yes	☐No	☐N/A
☐ Outdoor storage of equipment or materials	☐Yes	☐No	☐N/A
☐ Vehicle and equipment cleaning	☐Yes	☐No	☐N/A
☐ Vehicle/equipment repair and maintenance	☐Yes	☐No	☐N/A
☐ Fuel dispensing areas	☐Yes	☐No	☐N/A
☐ Loading docks	☒Yes	☐No	☐N/A
☐ Fire sprinkler test water	☒Yes	☐No	☐N/A
☐ Miscellaneous drain or wash water	☐Yes	☐No	☐N/A
☐ Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above. Site does not propose: interior floor drains, interior parking garage, water features outdoor storage of equipment or materials, vehicle/equipment cleaning nor maintenance, fuel dispensing areas.			

Site Design BMP Checklist for All Development Projects (Standard Projects and PDPs)

Form I-5

Project Identification

Project Name: EASTLAKE BEHAVIORAL HEALTH HOSPITAL

Permit Application Number: DR 19-0012, CUP 19-0010, PER 19-0006

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 manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification 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: There is no existing natural drainage pathway nor hydrologic features			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification if SD-2 not implemented: Click here to enter text			
SD-3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification if SD-3 not implemented: 32% of the site will be landscaped			
SD-4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification if SD-4 not implemented: PR-1 BASINS BOTTOMS PROVIDE MINIMIZED COMPACTION			

Form I-5 Page 2 of 2			
Site Design Requirement	**Applied?**		
SD-5 Impervious Area Dispersion	☒Yes	☐No	☐N/A
Discussion / justification if SD-5 not implemented:			
SD-6 Runoff Collection	☐Yes	☐No	☒N/A
Discussion / justification if SD-6 not implemented: Per Form B.3-1 Harvest and Use is infeasible			
SD-7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification if SD-7 not implemented: Click here to enter text.			
SD-8 Harvesting and Using Precipitation	☐Yes	☐No	☒N/A
Discussion / justification if SD-8 not implemented: Per Form B.3-1 Harvest and Use is infeasible			

Summary of PDP Structural BMPs

Form I-6
(For PDPs)

Project Identification

Project Name: EASTLAKE BEHAVIORAL HEALTH HOSPITAL

Permit Application Number: DR 19-0012, CUP 19-0010, PER 19-0006

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative to certify construction of the structural BMPs (see Section 1.12 of the manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the manual).

Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

One PR-1 biofiltration basin is being proposed for this project on the southwest corner of the site for HMP and pollutant control of DMA 1 . A second PR-1 biofiltration basin is being proposed on the southeast corner of the site for HMP and pollutant control of DMA 2.

(Continue on page 2 as necessary.)

Form I-6 Page 3 of 6 (Copy as many as needed)

Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No.: 1

Construction Plan Sheet No.: C-5

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)
☐ 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 manual)	Kamal S. Swies, P.E. 48592 7801 Mission Center Court, Suite 100 San Diego, CA 92108 (619) 296-5565 kss@ks-engr.com
Who will be the final owner of this BMP?	Eastlake Behavioral Center
Who will maintain this BMP into perpetuity?	Eastlake Behavioral Center
What is the funding mechanism for maintenance?	Private

Discussion (as needed):
Click here to enter text.

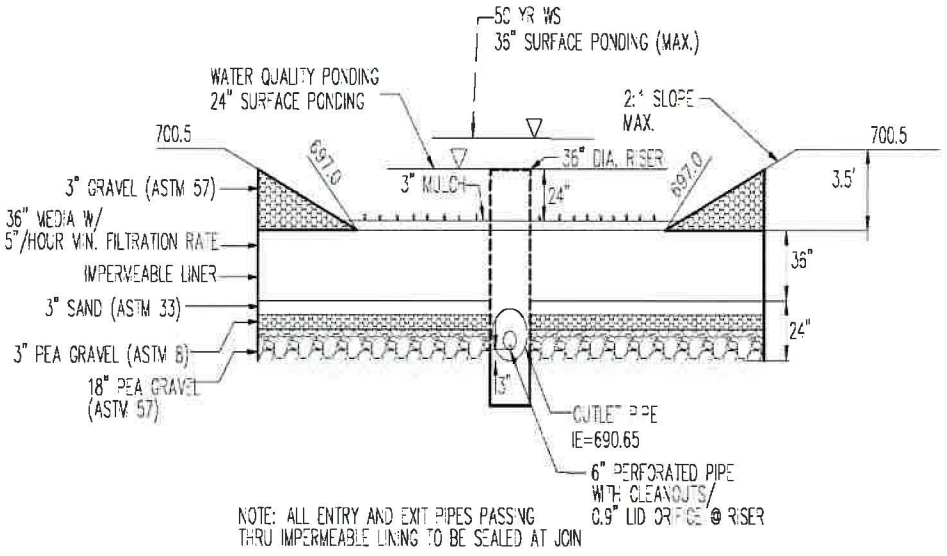
Form I-6 Page 4 of 6 (Copy as many as needed)

Structural BMP ID No.: BMP 1

Construction Plan Sheet No.: C-5

Discussion (as needed):

Click here to enter text.



Form I-6 Page 5 of 6 Copy as many as needed)	
Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No.: 2	
Construction Plan Sheet No.: C-5	
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) ☐ 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 manual)	Kamal S. Swies, P.E. 48592 7801 Mission Center Court, Suite 100 San Diego, CA 92108 (619) 296-5565 kss@ks-engr.com
Who will be the final owner of this BMP?	Eastlake Behavioral Center
Who will maintain this BMP into perpetuity?	Eastlake Behavioral Center
What is the funding mechanism for maintenance?	Private
Discussion (as needed): Click here to enter text.	

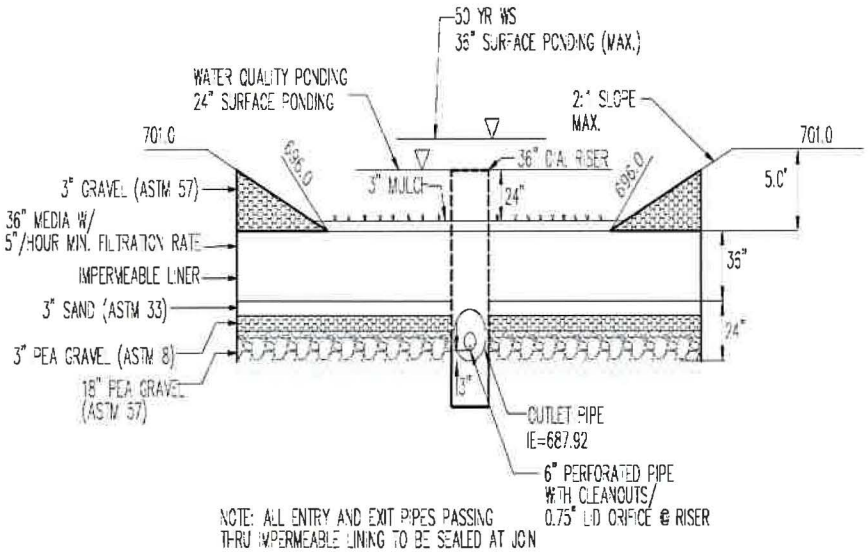
Form I-6 Page 6 of 4 (Copy as many as needed)

Structural BMP ID No.: BMP 2

Construction Plan Sheet No.: C-5

Discussion (as needed):

Click here to enter text.



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

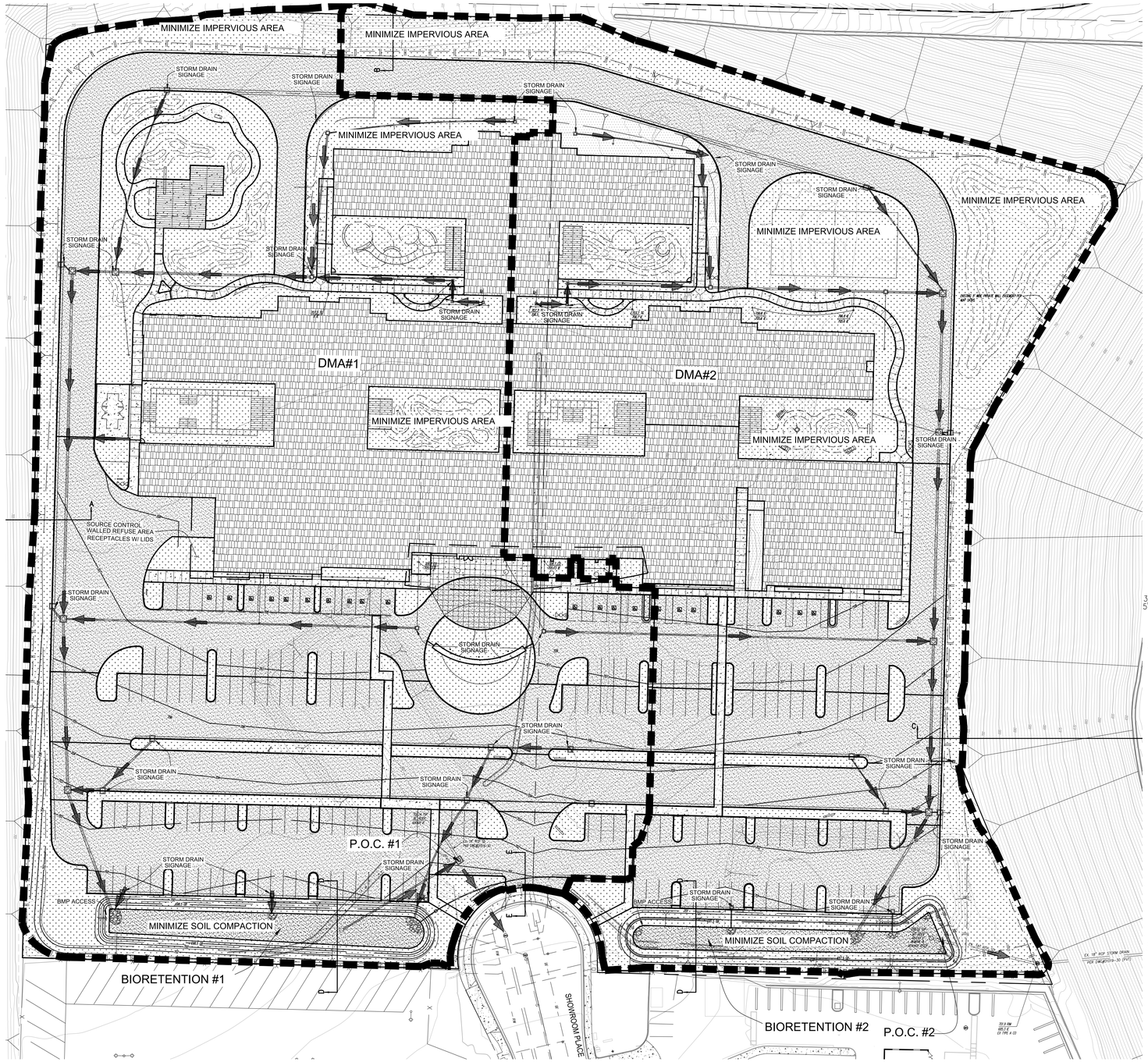
☒ Proposed impervious features

☒ 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)

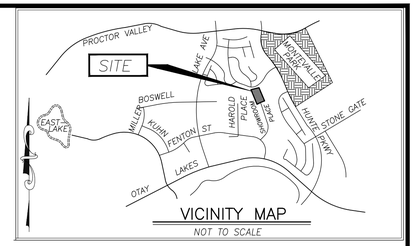
☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)

☒ Structural BMPs (identify location, type of BMP, and size/detail)



LEGEND

FEATURE	SYMBOL
SURFACE FLOW	→ →
DRAINAGE STRUCTURE FLOW	→ →
DRAINAGE MANAGEMENT AREA (TRIBUTARY TO BIOFILTRATION)	
PROPOSED AC PAVEMENT	
PROPOSED P.C.C.	
PROPOSED ROOF	
PROPOSED LANDSCAPED AREA WITH DROUGHT TOLERANT SPECIES	
PROPOSED BIOFILTRATION AREA (TREATMENT CONTROL)	
PROPOSED TREE WELL	
ROOF DRAIN	RD



VICINITY MAP
NOT TO SCALE

NO DUMPING GOES TO OCEAN — think BLUE — NO TIRAR BASURA LLEGA AL MAR

1. THESE ARE SAMPLE TILES AND SIGNS.
2. CITY ENGINEER TO DESIGNATE OR APPROVE SIGNS, TILES OR STENCILS.
3. PROVIDE LABELING WITH PROHIBITIVE LANGUAGE ("NO DUMPING GOES TO OCEAN – NO TIRAR BASURA LLEGA AL MAR")
4. SIGN SHOULD BE PLACED ON THE CATCH BASIN GRATE.
5. SIGN SHALL HAVE A WHITE BACKGROUND WITH BLUE LETTERING.

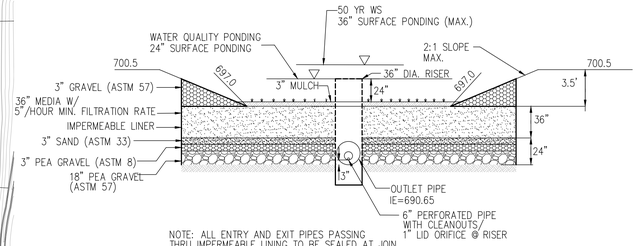
STORM DRAIN SIGNAGE
NOT TO SCALE

AREAS DRAINING TO BIOFILTRATION BASIN #1 (DMA #1)

POST-PROJECT SURFACE TYPE	DMA AREA (SF)	DMA RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	IMP SIZING FACTOR (WM ONLY)	MIN. AREA (S.F.)	PROPOSED AREA (S.F.)
ROOF AND PAVEMENT	156,292	0.9	140,663			
LANDSCAPE	87,991	0.1	8,799			
TOTAL DMA AREA=	244,283 SF		149,462	0.03	4,484	7,456

AREAS DRAINING TO BIOFILTRATION BASIN #2 (DMA #2)

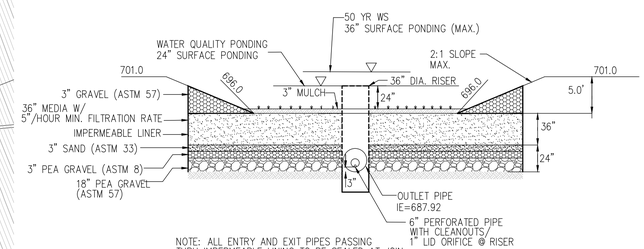
POST-PROJECT SURFACE TYPE	DMA AREA (SF)	DMA RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	IMP SIZING FACTOR (WM ONLY)	MIN. AREA (S.F.)	PROPOSED AREA (S.F.)
ROOF AND PAVEMENT	114,202	0.9	102,182			
LANDSCAPE	94,170	0.1	9,417			
TOTAL DMA AREA=	208,372 SF		111,599	0.03	3,348	6,690



NOTE: ALL ENTRY AND EXIT PIPES PASSING THRU IMPERMEABLE LINING TO BE SEALED AT JOIN

BMP	H (IN)	LID ORIFICE (IN)	AREA (BMP) FT 2	AREA (TOP) FT 2	TOTAL SURFACE DEPTH FT	DESIGN VOLUME CF
1	24	0.9	7,456	8,495	3.5	6,572

BMP1- BIOFILTRATION WITH PARTIAL INFILTRATION PR-1
NOT TO SCALE



NOTE: ALL ENTRY AND EXIT PIPES PASSING THRU IMPERMEABLE LINING TO BE SEALED AT JOIN

BMP	H (IN)	LID ORIFICE (IN)	AREA (BMP) FT 2	AREA (TOP) FT 2	TOTAL SURFACE DEPTH FT	DESIGN VOLUME CF
2	24	0.75	6,690	9,497	5.0	4,874

BMP2- BIOFILTRATION WITH PARTIAL INFILTRATION PR-1
NOT TO SCALE

GROUNDWATER
ACCORDING TO THE UPDATED GEOTECHNICAL EVALUATION REPORT PREPARED BY NINYO AND MOORE DATED MARCH 6, 2019; NO GROUND WATER WAS OBSERVED IN THE SUBSURFACE EXPLORATIONS AT AT DEPTH OF 46 FEET.

CCSYA NOTE:
PROJECT IS NOT WITHIN OR DOESN'T RECEIVE OR DRAINS FROM CRITICAL COARSE SEDIMENT YIELD AREAS. SEE ATTACHMENT 2b

BMP CATEGORY/TYPE
BIOFILTRATION PR-1

UNDERLAYING SOIL GROUP
ACCORDING TO THE NATIONAL COOPERATIVE SOIL SURVEY (USDA) THE UNDERLAYING SOIL CONSISTS OF SOIL TYPE D.

TOTAL SITE AREA
454,330 SQ. FT.

TOTAL DISTURBED AREA
427,759 SQ. FT.

K&S ENGINEERING, INC.
Planning . Engineering . Surveying
7801 Mission Center Court, Suite 100 San Diego, CA 92108
(619) 296-5565 Fax: (619) 296-5564

REGISTERED PROFESSIONAL ENGINEER — KAMAL S. SWEIS — No. 48592 EXP 6/30/20 — CIVIL — STATE OF CALIFORNIA

DRAINAGE MANAGEMENT AREA (DMA)
ATTACHMENT 1a

DMA SHEET FOR:

ACADIA HEALTH CARE

SHEET 1 OF 1

Worksheet B.3-1. Harvest and Use Feasibility Screening

Harvest and Use Feasibility Screening	Worksksheet B.3-1

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

- ■ Toilet and urinal flushing
- ■ Landscape irrigation
- ☐ Other:_____

Land type= office (table B.3-1)
Total use per employee = 7 (table B.3-1)
plant water use= moderate
36 hr irrigation demand= 1,470 Gal / AC (per 36 hr period) (table B.3-3)
total patients employees= 160

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

[Provide a summary of calculations here]

T&U=7 Gal/day x 160 persons x 1.5 day /7.48Gal per FT3= 224
LI= 1,470 Gal x 0.95 ACx1.5day / 7.48 Gal per FT3= 280
Total 36hr demand=T&U + LI = 224 + 280 = 504 CF

3. Calculate the DCV using worksheet B-2.1.

[Provide a results here]

DCV= 6,572 + 4,874= 11,446 (from the two basins)
0.25 DCV = 0.25X11,446 = 2,861 CF

3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
Yes / **No** ⇨ ⇩	**Yes** / **No** ⇨ ⇩	**Yes** ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible. INFEASIBLE

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition	Worksheet C.4-1

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		✓

Provide basis:

As presented in the project geotechnical evaluation report (Ninyo & Moore, 2019), in-situ infiltration rates at the site were measured between 0.02 inches per hour and 0.47 inches per hour. Any infiltration system utilizing these results should apply the appropriate factor of safety to determine applicable site infiltration rates prior to design. For this project, a Suitability Assessment Safety Factor of 2.25 should be used. The design safety factor shall be determined by the design engineer.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		✓

Provide basis:

As discussed in the project geotechnical evaluation report (Ninyo & Moore, 2019), laboratory testing of the subsurface soils indicated the presence of soils with high expansion potential. Infiltration of storm water into expansive soils is not recommended. Additionally, fill slopes up to 90 feet in height are present on the west, east, and north portions of the site. Infiltration within 50 feet of the top of a slope is anticipated to induce seepage on the slope face and increase the risk of slope failures in these areas. As stated in the project geotechnical evaluation report, Ninyo & Moore recommends that the bottom and sides of stormwater control devices be lined with an impermeable liner.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	✓	
Provide basis: As discussed in the project geotechnical evaluation report (Ninyo & Moore, 2019), groundwater was not encountered during our subsurface exploration and is anticipated at depths in excess of 60 feet. Based on the measured infiltration rates and the anticipated groundwater depth, infiltration at the site is not likely to have a significant impact on groundwater contamination. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	✓	
Provide basis: Based on the measured infiltration rates and the distance between the proposed BMPs and the nearest surface water (Salt Creek), infiltration at the site is not likely to have a significant impact to the water balance of the creek or increased discharge of contaminated groundwater to surface waters. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are **"Yes"** a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is **"No"**, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2	Proceed to Part 2	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet C.4-1 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	✓	

Provide basis:

As presented in the project geotechnical evaluation report (Ninyo & Moore, 2019), in-situ infiltration rates at the site were measured between 0.02 inches per hour and 0.47 inches per hour. Any infiltration system utilizing these results should apply the appropriate factor of safety to determine applicable site infiltration rates prior to design. For this project, a Suitability Assessment Safety Factor of 2.25 should be used. The design safety factor shall be determined by the design engineer.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		✓

Provide basis:

As discussed in the project geotechnical evaluation report (Ninyo & Moore, 2019), laboratory testing of the subsurface soils indicated the presence of soils with high expansion potential. Infiltration of storm water into expansive soils is not recommended. Additionally, fill slopes up to 90 feet in height are present on the west, east, and north portions of the site. Infiltration within 50 feet of the top of a slope is anticipated to induce seepage on the slope face and increase the risk of slope failures in these areas. As stated in the project geotechnical evaluation report, Ninyo & Moore recommends that the bottom and sides of stormwater control devices be lined with an impermeable liner.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	✓	
Provide basis: As discussed in the project geotechnical evaluation report (Ninyo & Moore, 2019), groundwater was not encountered during our subsurface exploration and is anticipated at depths in excess of 60 feet. Based on the measured infiltration rates and the anticipated groundwater depth, infiltration at the site is not likely to have a significant impact on groundwater contamination. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	✓	
Provide basis: Based on the measured infiltration rates and the distance between the proposed BMPs and the nearest surface water (Salt Creek), infiltration at the site is not likely to have a significant impact to the water balance of the creek or increased discharge of contaminated groundwater to surface waters. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		No infiltration

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	3	0.75
		Site soil variability	0.25	3	0.75
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					2.25
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					0.29
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					0.13

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

Two infiltration tests were performed at each of the four proposed basin areas for a total of eight tests. Tests were performed in boreholes drilled to depths of 5 feet below existing grades. In-situ infiltration rates at the site were measured between 0.02 and 0.47 inches per hour. Test locations and infiltration tests results are presented in the project geotechnical evaluation report (Ninyo and Moore, 2019)

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	3	0.75
		Site soil variability	0.25	3	0.75
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					2.25
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					0.27
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					0.14

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

Two infiltration tests were performed at each of the four proposed basin areas for a total of eight tests. Tests were performed in boreholes drilled to depths of 5 feet below existing grades. In-situ infiltration rates at the site were measured between 0.02 and 0.47 inches per hour. Test locations and infiltration tests results are presented in the project geotechnical evaluation report (Ninyo and Moore, 2019)

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.53	inches
2	Area tributary to BMP (s)	A=	5.6	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.61	unitless
4	Street trees volume reduction	TCV=	-	cubic-feet
5	Rain barrels volume reduction	RCV=	-	cubic-feet
6	Calculate DCV =(3630 x C x d x A) – TCV - RCV	DCV=	6,572	cubic-feet

WEIGHTED RUNOFF FACTOR EQUATION;

Wc=(C*)(AREA imp)+(C*)(AREA perv)/TOTAL AREA

Where:

Aimp=Tributary Area 156,292 sf
Aperv=Tributary Area 87,991 sf

Wc=(0.90)(156,292sf)+(0.10)(87,991 sf)/244,283sf
Wc= 0.61

Simple Sizing Method for Biofiltration BMPs BMP1 Worksheet B.5-1		
1 Remaining DCV after implementing retention BMPs	6572	cubic-feet
Partial Retention		
2 Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.15	in/hr.
3 Allowable drawdown time for aggregate storage below the underdrain	36	hours
4 Depth of runoff that can be infiltrated [Line 2 x Line 3]	5.4	inches
5 Aggregate pore space	0.40	in/in
6 Required depth of gravel below the underdrain [Line 4/ Line 5]	13.5	inches
7 Assumed surface area of the biofiltration BMP	7456	sq-ft
8 Media retained pore storage	0.1	in/in
9 Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	3345	cubic-feet
10 DCV that requires biofiltration [Line 1 – Line 9]	3227	cubic-feet
BMP Parameters		
11 Surface Ponding [6 inch minimum, 12 inch maximum]	24	inches
12 Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	36	inches
Aggregate Storage above underdrain invert (12 inches typical) – use 0 13 inches for sizing if the aggregate is not over the entire bottom surface area	24	inches
14 Media available pore space	0.2	in/in
Media filtration rate to be used for sizing (5 in/hr. with no outlet 15 control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	0.66	in/hr.
Baseline Calculations		
16 Allowable Routing Time for sizing	6	hours
17 Depth filtered during storm [Line 15 x Line 16]	4	inches
18 Depth of Detention Storage [Line 11 + (Line 12 x Line 14)+ (Line 13 x Line 5)]	40.8	inches
19 Total Depth Treated [Line 17 + Line 18]	44.8	inches

Simple Sizing Method for Biofiltration BMPs Worksheet B.5-1 (Page 2 of 2)			
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	4840.5	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	1297.7	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]		cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12		sq-ft
Footprint of the BMP			
24	Area draining to the BMP	244283	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.61	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	4470	sq-ft
25	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	3732	sq-ft
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	unitless
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	4470	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	3732	sq-ft

Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of the DCV retained by the BMP [Line 9/ Line 1]	0.5	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV > 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	☒ Yes ☐ No	

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.53	inches
2	Area tributary to BMP (s)	A=	4.78	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.53	unitless
4	Street trees volume reduction	TCV=	-	cubic-feet
5	Rain barrels volume reduction	RCV=	-	cubic-feet
6	Calculate DCV =(3630 x C x d x A) – TCV - RCV	DCV=	4,874	cubic-feet

WEIGHTED RUNOFF FACTOR EQUATION;

Wc=(C*)(AREA imp)+(C*)(AREA perv)/TOTAL AREA

Where:

Aimp=Tributary Area 114,202 sf
Aperv=Tributary Area 94,170 sf

Wc=(0.90)(114,202sf)+(0.10)(94,170 sf)/208,372sf
Wc= 0.53

Simple Sizing Method for Biofiltration BMPs	BMP2 Worksheet B.5-1	
1 Remaining DCV after implementing retention BMPs	4874	cubic-feet
Partial Retention		
2 Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.14	in/hr.
3 Allowable drawdown time for aggregate storage below the underdrain	36	hours
4 Depth of runoff that can be infiltrated [Line 2 x Line 3]	5	inches
5 Aggregate pore space	0.40	in/in
6 Required depth of gravel below the underdrain [Line 4/ Line 5]	12.6	inches
7 Assumed surface area of the biofiltration BMP	6690	sq-ft
8 Media retained pore storage	0.1	in/in
9 Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	2784	cubic-feet
10 DCV that requires biofiltration [Line 1 – Line 9]	2090	cubic-feet
BMP Parameters		
11 Surface Ponding [6 inch minimum, 12 inch maximum]	24	inches
12 Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	36	inches
Aggregate Storage above underdrain invert (12 inches typical) – use 0 13 inches for sizing if the aggregate is not over the entire bottom surface area	24	inches
14 Media available pore space	0.2	in/in
Media filtration rate to be used for sizing (5 in/hr. with no outlet 15 control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	0.58	in/hr.
Baseline Calculations		
16 Allowable Routing Time for sizing	6	hours
17 Depth filtered during storm [Line 15 x Line 16]	3.5	inches
18 Depth of Detention Storage [Line 11 + (Line 12 x Line 14)+ (Line 13 x Line 5)]	40.8	inches
19 Total Depth Treated [Line 17 + Line 18]	44.3	inches

Simple Sizing Method for Biofiltration BMPs	Worksheet B.5-1 (Page 2 of 2)	
Option 1 – Biofilter 1.5 times the DCV		
20 Required biofiltered volume [1.5 x Line 10]	3135	cubic-feet
21 Required Footprint [Line 20/ Line 19] x 12	850	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding		
22 Required Storage (surface + pores) Volume [0.75 x Line 10]		cubic-feet
23 Required Footprint [Line 22/ Line 18] x 12		sq-ft
Footprint of the BMP		
24 Area draining to the BMP	208372	sq-ft
25 Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.53	
26 Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	3313	sq-ft
25 Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	3732	sq-ft
26 BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	unitless
27 Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	3313	sq-ft
28 Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	3732	sq-ft

Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of the DCV retained by the BMP [Line 9/ Line 1]	0.57	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV > 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	☒ Yes ☐ No	

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Diego County Area, California

Acadia Healthcare Chula Vista

February 19, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,830 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 13, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 7, 2014—Jan 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DaC	Diablo clay, 2 to 9 percent slopes	6.5	62.1%
DaE	Diablo clay, 15 to 30 percent slopes	4.0	37.9%
Totals for Area of Interest		**10.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Diego County Area, California

DaC—Diablo clay, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbb8
Elevation: 30 to 3,000 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 200 to 320 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Diablo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Diablo

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous sandstone and shale

Typical profile

H1 - 0 to 15 inches: clay
H2 - 15 to 32 inches: silty clay loam, clay
H2 - 15 to 32 inches: weathered bedrock
H3 - 32 to 36 inches:

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 24 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Altamont

Percent of map unit: 10 percent

Hydric soil rating: No

Linne

Percent of map unit: 3 percent
Hydric soil rating: No

Olivenhain

Percent of map unit: 2 percent
Hydric soil rating: No

DaE—Diablo clay, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbbb
Elevation: 200 to 3,250 feet
Mean annual precipitation: 9 to 25 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 200 to 310 days
Farmland classification: Not prime farmland

Map Unit Composition

Diablo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Diablo

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous sandstone and shale

Typical profile

H1 - 0 to 15 inches: clay
H2 - 15 to 32 inches: silty clay loam, clay
H2 - 15 to 32 inches: weathered bedrock
H3 - 32 to 36 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 24 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Altamont

Percent of map unit: 10 percent
Hydric soil rating: No

Linne

Percent of map unit: 3 percent
Hydric soil rating: No

Oliventain

Percent of map unit: 2 percent
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

Page intentionally left blank for double-sided printing

☐ 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

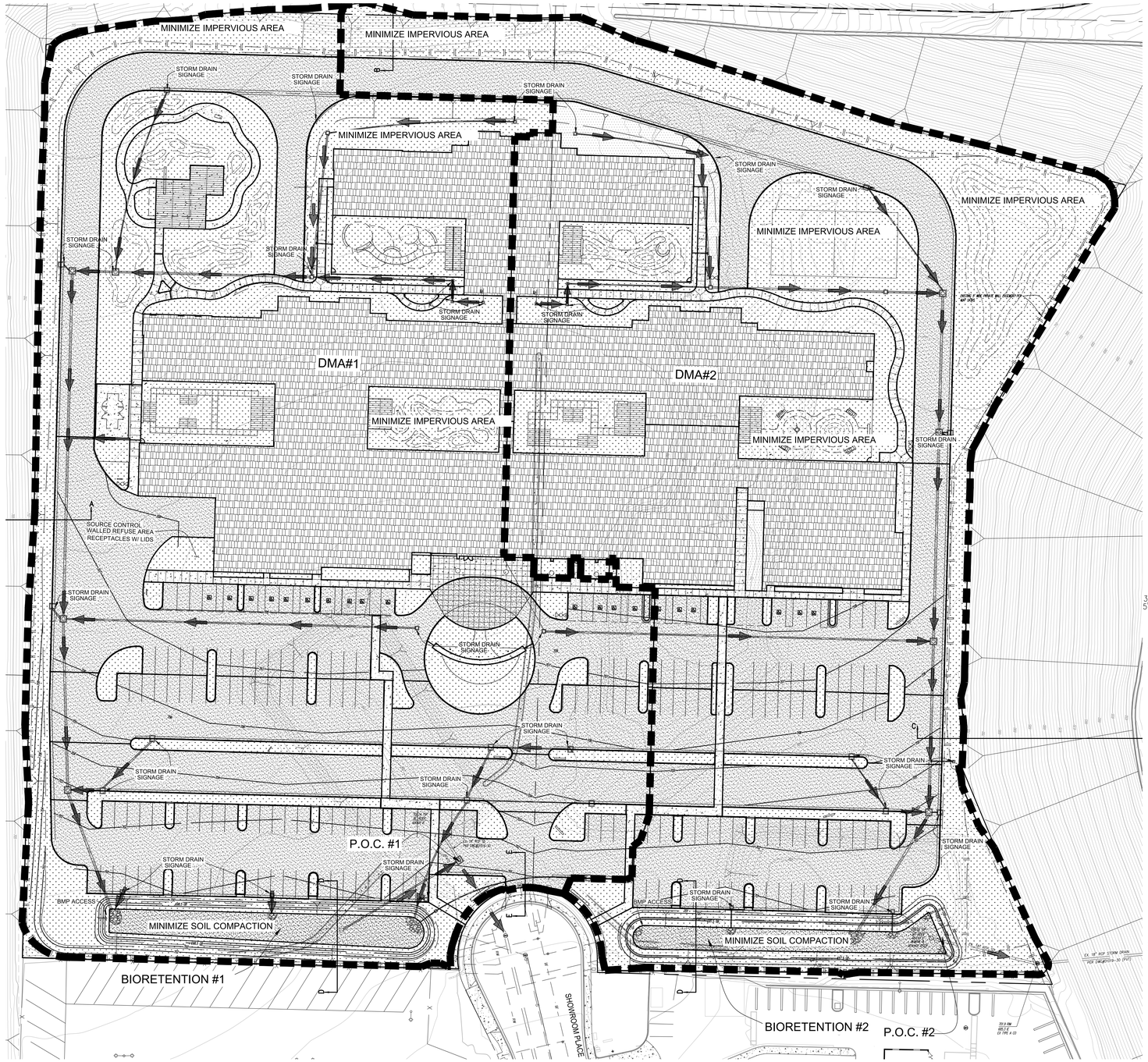
☒ Proposed impervious features

☒ Proposed design features and surface treatments used to minimize imperviousness

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

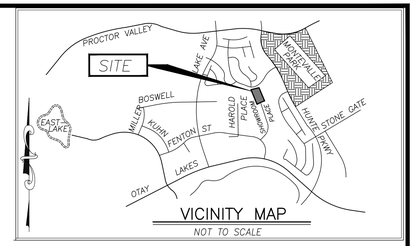
☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)

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



LEGEND

FEATURE	SYMBOL
SURFACE FLOW	→ →
DRAINAGE STRUCTURE FLOW	→ →
DRAINAGE MANAGEMENT AREA (TRIBUTARY TO BIOFILTRATION)	
PROPOSED AC PAVEMENT	
PROPOSED P.C.C.	
PROPOSED ROOF	
PROPOSED LANDSCAPED AREA WITH DROUGHT TOLERANT SPECIES	
PROPOSED BIOFILTRATION AREA (TREATMENT CONTROL)	
PROPOSED TREE WELL	
ROOF DRAIN	RD



VICINITY MAP
NOT TO SCALE

NO DUMPING GOES TO OCEAN — think BLUE — NO TIRAR BASURA LLEGA AL MAR

1. THESE ARE SAMPLE TILES AND SIGNS.
2. CITY ENGINEER TO DESIGNATE OR APPROVE SIGNS, TILES OR STENCILS.
3. PROVIDE LABELING WITH PROHIBITIVE LANGUAGE ("NO DUMPING GOES TO OCEAN – NO TIRAR BASURA LLEGA AL MAR")
4. SIGN SHOULD BE PLACED ON THE CATCH BASIN GRATE.
5. SIGN SHALL HAVE A WHITE BACKGROUND WITH BLUE LETTERING.

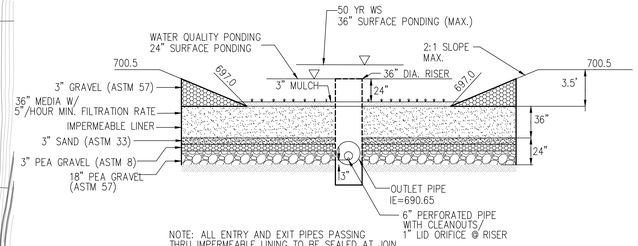
STORM DRAIN SIGNAGE
NOT TO SCALE

AREAS DRAINING TO BIOFILTRATION BASIN #1 (DMA #1)

POST-PROJECT SURFACE TYPE	DMA AREA (SF)	DMA RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	IMP SIZING FACTOR (WM ONLY)	MIN. AREA (S.F.)	PROPOSED AREA (S.F.)
ROOF AND PAVEMENT	156,292	0.9	140,663			
LANDSCAPE	87,991	0.1	8,799			
TOTAL DMA AREA=	244,283 SF		149,462	0.03	4,484	7,456

AREAS DRAINING TO BIOFILTRATION BASIN #2 (DMA #2)

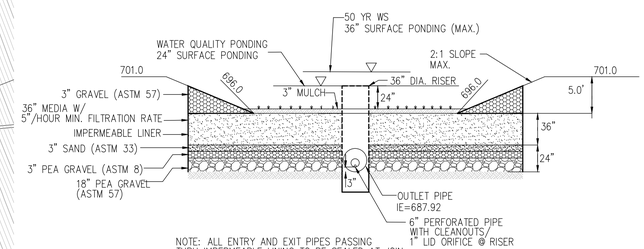
POST-PROJECT SURFACE TYPE	DMA AREA (SF)	DMA RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	IMP SIZING FACTOR (WM ONLY)	MIN. AREA (S.F.)	PROPOSED AREA (S.F.)
ROOF AND PAVEMENT	114,202	0.9	102,182			
LANDSCAPE	94,170	0.1	9,417			
TOTAL DMA AREA=	208,372 SF		111,599	0.03	3,348	6,690



NOTE: ALL ENTRY AND EXIT PIPES PASSING THRU IMPERMEABLE LINING TO BE SEALED AT JOIN

BMP	H (IN)	LID ORIFICE (IN)	AREA (BMP) FT 2	AREA (TOP) FT 2	TOTAL SURFACE DEPTH FT	DESIGN VOLUME CF
1	24	0.9	7,456	8,495	3.5	6,572

BMP1- BIOFILTRATION WITH PARTIAL INFILTRATION PR-1
NOT TO SCALE



NOTE: ALL ENTRY AND EXIT PIPES PASSING THRU IMPERMEABLE LINING TO BE SEALED AT JOIN

BMP	H (IN)	LID ORIFICE (IN)	AREA (BMP) FT 2	AREA (TOP) FT 2	TOTAL SURFACE DEPTH FT	DESIGN VOLUME CF
2	24	0.75	6,690	9,497	5.0	4,874

BMP2- BIOFILTRATION WITH PARTIAL INFILTRATION PR-1
NOT TO SCALE

K&S ENGINEERING, INC.
Planning . Engineering . Surveying
7801 Mission Center Court, Suite 100 San Diego, CA 92108
(619) 296-5565 Fax: (619) 296-5564

REGISTERED PROFESSIONAL ENGINEER — KAMAL S. JEWELS — No. 48592 EXP 6/30/20 — CIVIL — STATE OF CALIFORNIA

GROUNDWATER
ACCORDING TO THE UPDATED GEOTECHNICAL EVALUATION REPORT PREPARED BY NINYO AND MOORE DATED MARCH 6, 2019; NO GROUND WATER WAS OBSERVED IN THE SUBSURFACE EXPLORATIONS AT AT DEPTH OF 46 FEET.

CCSYA NOTE:
PROJECT IS NOT WITHIN OR DOESN'T RECEIVE OR DRAINS FROM CRITICAL COARSE SEDIMENT YIELD AREAS. SEE ATTACHMENT 2b

BMP CATEGORY/TYPE
BIOFILTRATION PR-1

UNDERLAYING SOIL GROUP
ACCORDING TO THE NATIONAL COOPERATIVE SOIL SURVEY (USDA) THE UNDERLAYING SOIL CONSISTS OF SOIL TYPE D.

TOTAL SITE AREA
454,330 SQ. FT.

TOTAL DISTURBED AREA
427,759 SQ. FT.

HYDROMODIFICATION MANAGEMENT (HMP)
ATTACHMENT 2a

DMA SHEET FOR:

ACADIA HEALTH CARE

SHEET 1 OF 1

CRITICAL COARSE SEDIMENT YIELD AREAS MAP

Source: SWRCB

K&S ENGINEERING, INC.
Planning Engineering Surveying

HMP Modeling for Hydromodification Compliance

DR 19-0012, CUP 19-0010, PER 19-0006

Prepared for:

EASTLAKE BEHAVIORAL HEALTH HOSPITAL

6100 Tower Circle, Suite 1000
Franklin, TN 91914 370067

Prepared by:

K&S ENGINEERING, INC.
7801 Mission Center Court, Suite 100
San Diego, CA 92108
619.296.5565

August 1, 2019
K&S JN 16-054

Kamal S. Sweis RCE 48592

8/1/2019
Date

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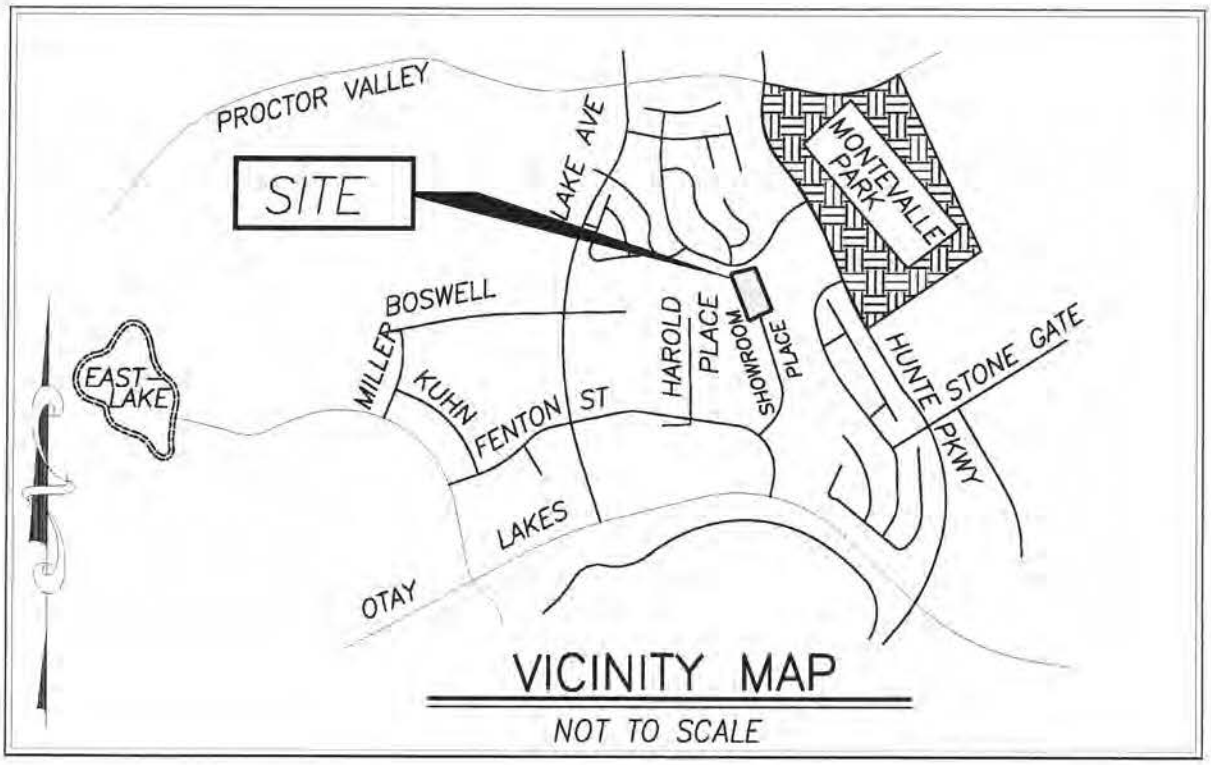


2 INTRODUCTION

The project consists of two existing mass graded lots, i.e., Lots 7 & 8 of Map No. 14395

The project consists of grading and drainage improvements for one medical building with loading docks, parking, landscaping, storm drains and biofiltration BMP's for pollutant control and hydromodification purposes.

The subject report reflects the proposed precise grading and drainage as shown on precise grading plan Drawing No. C-1 through C-5 of DRC 19-0012.

3 PURPOSE OF THIS MODEL

Continuous simulation hydrologic modeling was conducted on this project to demonstrate compliance with the performance standards for hydromodification management in San Diego.

The San Diego Hydrology Model (SDHM) distributed by Clear Creek Solutions, Inc. was used for hydromodification management on the subject driveway.

The inputs required to develop SDHM models include rainfall, watershed characteristics, and BMP configurations. The Bonita gauge from the Project Clean Water website was used for this study. Default SDHM 3.1 pervious and impervious soil parameters used are found in Appendix A of this report.

Per the NRCS web soil survey, the project site is situated upon Class D soils. Soils have been assumed to be compacted to represent the current existing developed condition of the site, while fully compacted in the post developed conditions

4 HMP MODELING

In current existing conditions, the existing site is a mass graded development that includes vegetated areas areas.
Table 4.1 below illustrates the pre-developed area and impervious percentage accordingly.

4.1 Summary of Predeveloped Condition

POC	DMA ID	Tributary Area, A (Ac)	Impervious Percentage, Ip
POC-1	DMA-1	5.60	0%
POC-2	DMA-2	4.78	0%

Runoff from the improved areas of the project site are drained to two one onsite receiving LID BMPs. Once flows are routed via the proposed BMPs, onsite flows are then discharged to the existing discharge locations. Table 4.2 summarizes the post-developed area and impervious percentage accordingly.

4.2 Summary of Proposed Condition

POC	DMA ID	Tributary Area, A (Ac)	Impervious Percentage, Ip
POC-1	DMA-1	5.60	64%
POC-2	DMA-2	4.78	56%

Two HMP Biofiltration basins with Partial Retention are proposed within the project site and are responsible for performing hydromodification and water quality requirements for the project site. Runoff is discharged to these dual purpose water quality and HMP biofiltration basins prior to draining to the receiving POC's.

In developed conditions, the Biofiltration basin 1 will have surface depth of 24-inches. This Biofiltration basin will include a riser spillway structure set to an elevation of 24-inches from the surface bottom of the basin.

Underneath the basin invert is located the proposed LID biofiltration portion of the drainage facility. This portion of the basin is comprised of a 3-inch layer of mulch, an 36-inch layer of amended soil (a highly sandy, organic rich composite with an infiltration capacity of at least 5 inches/hr) and an 24-inch layer of gravel which includes the 6 inches of filter layer and the 3 inches of dead storage below the LID orifice. The BMP will be un lined to allow infiltration into the underlying soil.

Similarly, the Biofiltration basin 2 will have surface depth of 24-inches. This Biofiltration basin will include a riser spillway structure set to an elevation of 24-inches from the surface bottom of the basin.

Underneath the basin invert is located the proposed LID biofiltration portion of the drainage facility. This portion of the basin is comprised of a 3-inch layer of mulch, an 36-inch layer of amended soil (a highly sandy, organic rich composite with an infiltration capacity of at least 5 inches/hr) and an 24-inch layer of gravel which includes the 6 inches of filter layer and the 3 inches of dead storage below the LID orifice. The BMP will be un lined to allow infiltration into the underlying soil. The BMP will be un lined to allow infiltration into the underlying soil.

TABLE 3 – SUMMARY OF DEVELOPED DUAL PURPOSE BMP

BMP	Tributary Area (Ac)	DIMENSIONS					
		BMP Area, (ft^2)	LID Orifice (in)	Gravel Depth (in)	Depth to Top of Riser(ft)	Weir Perimeter Length (ft)	Total Surface Depth (ft)
1	5.60	7,456	1.0"	24"	2.0'	9.42'	3.5'
2	4.78	6,690	1.0"	24"	2.0'	4.42'	5.0'

Water Quality BMP Sizing

The BMPs have been designed in accordance with City of Chula Vista 2015 BMP Design Manual sizing criteria.

5. REFERENCES

1 – "Final Hydromodification Management Plan (HMP) prepared for the County of San Diego", March 2011, Brown and Caldwell.

2 - San Diego Regional Water Quality Control Board Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

3 - "City of Chula Vista BMP Design Manual",.

4 – San Diego Hydrology Model 3.1 User Manual – April 2017

APPENDIX A -
SDHM 3.1 PROJECT REPORT
CALCULATIONS AND CHARTS

SDHM 3.1

PROJECT REPORT

General Model Information

Project Name:	18-062
Site Name:	Acadia
Site Address:	Shwiroom Place
City:	Chula Vista
Report Date:	8/2/2019
Gage:	BONITA
Data Start:	10/01/1971
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2019/04/19

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year
Low Flow Threshold for POC2:	10 Percent of the 2 Year
High Flow Threshold for POC2:	10 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Flat	5.61
Pervious Total	5.61
Impervious Land Use	acre
Impervious Total	0
Basin Total	5.61

Element Flows To:

Surface	Interflow	Groundwater

Basin 2

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Flat	4.78
Pervious Total	4.78
Impervious Land Use	acre
Impervious Total	0
Basin Total	4.78

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,NatVeg,Moderate	2.02
Pervious Total	2.02

Impervious Land Use	acre
IMPERVIOUS-MOD	3.59
Impervious Total	3.59
Basin Total	5.61

Element Flows To:

Surface	Interflow	Groundwater
Surface Biofilter 1	Surface Biofilter 1	

Basin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,NatVeg,Moderate	2.16
Pervious Total	2.16

Impervious Land Use	acre
IMPERVIOUS-MOD	2.62
Impervious Total	2.62
Basin Total	4.78

Element Flows To:

Surface	Interflow	Groundwater
Surface Biofilter 2	Surface Biofilter 2	

Routing Elements
Predeveloped Routing

Mitigated Routing

Biofilter 1

Bottom Length:	223.00 ft.
Bottom Width:	20.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	3
Material type for second layer:	ESM
Material thickness of third layer:	2
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.29
Infiltration safety factor:	0.13
Total Volume Infiltrated (ac-ft.):	19.339
Total Volume Through Riser (ac-ft.):	3.381
Total Volume Through Facility (ac-ft.):	71.696
Percent Infiltrated:	26.97
Total Precip Applied to Facility:	5.61
Total Evap From Facility:	5.875
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.9
Offset (in.):	3
Flow Through Underdrain (ac-ft.):	48.976
Total Outflow (ac-ft.):	71.696
Percent Through Underdrain:	68.31
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	36 in.
Element Flows To:	
Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
697.00	0.3009	0.0000	0.0000	0.0000
697.09	0.2974	0.0028	0.0000	0.0000
697.18	0.2936	0.0057	0.0000	0.0000
697.27	0.2898	0.0087	0.0000	0.0000
697.36	0.2861	0.0118	0.0000	0.0000
697.45	0.2823	0.0150	0.0000	0.0024
697.54	0.2785	0.0182	0.0000	0.0039
697.63	0.2748	0.0215	0.0000	0.0039
697.73	0.2711	0.0250	0.0000	0.0039
697.82	0.2674	0.0285	0.0000	0.0039
697.91	0.2637	0.0320	0.0000	0.0039
698.00	0.2600	0.0357	0.0000	0.0039
698.09	0.2563	0.0395	0.0000	0.0039
698.18	0.2527	0.0433	0.0000	0.0039
698.27	0.2491	0.0472	0.0000	0.0039
698.36	0.2454	0.0513	0.0018	0.0039
698.45	0.2418	0.0554	0.0027	0.0039
698.54	0.2382	0.0596	0.0044	0.0039
698.63	0.2346	0.0639	0.0052	0.0039
698.72	0.2311	0.0682	0.0064	0.0039

698.81	0.2275	0.0727	0.0070	0.0039
698.90	0.2240	0.0772	0.0080	0.0039
698.99	0.2204	0.0819	0.0085	0.0039
699.09	0.2169	0.0866	0.0093	0.0039
699.18	0.2134	0.0915	0.0097	0.0039
699.27	0.2099	0.0964	0.0104	0.0039
699.36	0.2064	0.1014	0.0108	0.0039
699.45	0.2030	0.1065	0.0114	0.0039
699.54	0.1995	0.1117	0.0118	0.0039
699.63	0.1961	0.1170	0.0124	0.0039
699.72	0.1927	0.1223	0.0127	0.0039
699.81	0.1893	0.1278	0.0132	0.0039
699.90	0.1859	0.1334	0.0135	0.0039
699.99	0.1825	0.1390	0.0140	0.0039
700.08	0.1791	0.1448	0.0143	0.0039
700.17	0.1758	0.1507	0.0148	0.0039
700.26	0.1724	0.1589	0.0151	0.0039
700.35	0.1691	0.1672	0.0155	0.0039
700.45	0.1658	0.1757	0.0158	0.0039
700.54	0.1625	0.1844	0.0162	0.0039
700.63	0.1592	0.1931	0.0165	0.0039
700.72	0.1559	0.2020	0.0169	0.0039
700.81	0.1527	0.2110	0.0171	0.0039
700.90	0.1494	0.2202	0.0175	0.0039
700.99	0.1462	0.2295	0.0178	0.0039
701.08	0.1430	0.2390	0.0180	0.0039
701.17	0.1398	0.2485	0.0181	0.0039
701.26	0.1366	0.2582	0.0185	0.0039
701.35	0.1334	0.2681	0.0192	0.0039
701.44	0.1302	0.2781	0.0201	0.0039
701.53	0.1271	0.2882	0.0210	0.0039
701.62	0.1240	0.2985	0.0220	0.0039
701.71	0.1208	0.3089	0.0230	0.0039
701.80	0.1177	0.3194	0.0239	0.0039
701.90	0.1146	0.3301	0.0248	0.0039
701.99	0.1116	0.3410	0.0257	0.0039
702.08	0.1085	0.3519	0.0265	0.0039
702.17	0.1054	0.3631	0.0274	0.0039
702.25	0.1024	0.3733	0.0492	0.0039

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
5.2500	0.3009	0.3733	0.0000	0.0530	0.0000
5.3407	0.3047	0.4008	0.0000	0.0530	0.0000
5.4313	0.3086	0.4286	0.0000	0.0530	0.0000
5.5220	0.3124	0.4567	0.0000	0.0530	0.0000
5.6126	0.3163	0.4852	0.0000	0.0530	0.0000
5.7033	0.3202	0.5140	0.0000	0.0530	0.0000
5.7940	0.3241	0.5433	0.0000	0.0530	0.0000
5.8846	0.3280	0.5728	0.0000	0.0530	0.0000
5.9753	0.3319	0.6027	0.0000	0.0530	0.0000
6.0659	0.3358	0.6330	0.0000	0.0530	0.0000
6.1566	0.3398	0.6636	0.0000	0.0530	0.0000
6.2473	0.3437	0.6946	0.0000	0.0530	0.0000
6.3379	0.3477	0.7259	0.0000	0.0530	0.0000
6.4286	0.3517	0.7576	0.0000	0.0530	0.0000
6.5192	0.3557	0.7897	0.0000	0.0530	0.0000
6.6099	0.3597	0.8221	0.0000	0.0530	0.0000

6.7005	0.3638	0.8549	0.0000	0.0530	0.0000
6.7912	0.3678	0.8881	0.0000	0.0530	0.0000
6.8819	0.3719	0.9216	0.0000	0.0530	0.0000
6.9725	0.3759	0.9555	0.0000	0.0530	0.0000
7.0632	0.3800	0.9898	0.0000	0.0530	0.0000
7.1538	0.3841	1.0244	0.0000	0.0530	0.0000
7.2445	0.3882	1.0594	0.0000	0.0530	0.0000
7.3352	0.3924	1.0948	0.7909	0.0530	0.0000
7.4258	0.3965	1.1306	2.3428	0.0530	0.0000
7.5165	0.4007	1.1667	4.3596	0.0530	0.0000
7.6071	0.4048	1.2032	6.7280	0.0530	0.0000
7.6978	0.4090	1.2401	9.3612	0.0530	0.0000
7.7885	0.4132	1.2774	12.177	0.0530	0.0000
7.8791	0.4174	1.3151	15.091	0.0530	0.0000
7.9698	0.4216	1.3531	18.017	0.0530	0.0000
8.0604	0.4259	1.3915	20.869	0.0530	0.0000
8.1511	0.4301	1.4303	23.565	0.0530	0.0000
8.2418	0.4344	1.4695	26.032	0.0530	0.0000
8.2500	0.4348	1.4731	28.212	0.0530	0.0000

Surface Biofilter 1

Element Flows To:

Outlet 1	Outlet 2
	Biofilter 1

Biofilter 2

Bottom Length:	184.00 ft.
Bottom Width:	20.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	3
Material type for second layer:	ESM
Material thickness of third layer:	2
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.27
Infiltration safety factor:	0.14
Total Volume Infiltrated (ac-ft.):	16.029
Total Volume Through Riser (ac-ft.):	2.711
Total Volume Through Facility (ac-ft.):	53.91
Percent Infiltrated:	29.73
Total Precip Applied to Facility:	4.763
Total Evap From Facility:	4.952
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.75
Offset (in.):	3
Flow Through Underdrain (ac-ft.):	35.17
Total Outflow (ac-ft.):	53.91
Percent Through Underdrain:	65.24
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	36 in.
Element Flows To:	
Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
696.00	0.2548	0.0000	0.0000	0.0000
696.09	0.2518	0.0023	0.0000	0.0000
696.18	0.2484	0.0047	0.0000	0.0000
696.27	0.2451	0.0072	0.0000	0.0000
696.36	0.2419	0.0097	0.0000	0.0000
696.45	0.2386	0.0124	0.0000	0.0020
696.54	0.2353	0.0150	0.0000	0.0032
696.63	0.2321	0.0178	0.0000	0.0032
696.73	0.2288	0.0206	0.0000	0.0032
696.82	0.2256	0.0235	0.0000	0.0032
696.91	0.2224	0.0265	0.0000	0.0032
697.00	0.2192	0.0295	0.0000	0.0032
697.09	0.2160	0.0327	0.0000	0.0032
697.18	0.2129	0.0359	0.0000	0.0032
697.27	0.2097	0.0391	0.0000	0.0032
697.36	0.2066	0.0425	0.0013	0.0032
697.45	0.2035	0.0459	0.0019	0.0032
697.54	0.2003	0.0494	0.0030	0.0032
697.63	0.1972	0.0529	0.0036	0.0032
697.72	0.1942	0.0566	0.0044	0.0032
697.81	0.1911	0.0603	0.0049	0.0032
697.90	0.1880	0.0641	0.0055	0.0032

697.99	0.1850	0.0680	0.0059	0.0032
698.09	0.1820	0.0719	0.0064	0.0032
698.18	0.1789	0.0760	0.0067	0.0032
698.27	0.1759	0.0801	0.0072	0.0032
698.36	0.1730	0.0842	0.0075	0.0032
698.45	0.1700	0.0885	0.0079	0.0032
698.54	0.1670	0.0928	0.0082	0.0032
698.63	0.1641	0.0973	0.0086	0.0032
698.72	0.1611	0.1018	0.0088	0.0032
698.81	0.1582	0.1064	0.0092	0.0032
698.90	0.1553	0.1110	0.0094	0.0032
698.99	0.1524	0.1158	0.0098	0.0032
699.08	0.1495	0.1206	0.0099	0.0032
699.17	0.1467	0.1255	0.0103	0.0032
699.26	0.1438	0.1324	0.0105	0.0032
699.35	0.1410	0.1394	0.0108	0.0032
699.45	0.1381	0.1466	0.0110	0.0032
699.54	0.1353	0.1538	0.0113	0.0032
699.63	0.1325	0.1612	0.0114	0.0032
699.72	0.1298	0.1686	0.0117	0.0032
699.81	0.1270	0.1762	0.0119	0.0032
699.90	0.1242	0.1840	0.0122	0.0032
699.99	0.1215	0.1918	0.0123	0.0032
700.08	0.1187	0.1997	0.0125	0.0032
700.17	0.1160	0.2078	0.0126	0.0032
700.26	0.1133	0.2160	0.0128	0.0032
700.35	0.1106	0.2243	0.0133	0.0032
700.44	0.1080	0.2327	0.0139	0.0032
700.53	0.1053	0.2413	0.0146	0.0032
700.62	0.1026	0.2499	0.0153	0.0032
700.71	0.1000	0.2587	0.0159	0.0032
700.80	0.0974	0.2677	0.0166	0.0032
700.90	0.0948	0.2767	0.0172	0.0032
700.99	0.0922	0.2858	0.0178	0.0032
701.08	0.0896	0.2951	0.0184	0.0032
701.17	0.0870	0.3045	0.0190	0.0032
701.25	0.0845	0.3132	0.0341	0.0032

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
5.2500	0.2548	0.3132	0.0000	0.0374	0.0000
5.3407	0.2581	0.3365	0.0000	0.0374	0.0000
5.4313	0.2615	0.3600	0.0000	0.0374	0.0000
5.5220	0.2648	0.3839	0.0000	0.0374	0.0000
5.6126	0.2682	0.4080	0.0000	0.0374	0.0000
5.7033	0.2716	0.4325	0.0000	0.0374	0.0000
5.7940	0.2750	0.4573	0.0000	0.0374	0.0000
5.8846	0.2785	0.4824	0.0000	0.0374	0.0000
5.9753	0.2819	0.5078	0.0000	0.0374	0.0000
6.0659	0.2853	0.5335	0.0000	0.0374	0.0000
6.1566	0.2888	0.5595	0.0000	0.0374	0.0000
6.2473	0.2923	0.5858	0.0000	0.0374	0.0000
6.3379	0.2958	0.6125	0.0000	0.0374	0.0000
6.4286	0.2993	0.6395	0.0000	0.0374	0.0000
6.5192	0.3028	0.6668	0.0000	0.0374	0.0000
6.6099	0.3063	0.6944	0.0000	0.0374	0.0000
6.7005	0.3099	0.7223	0.0000	0.0374	0.0000
6.7912	0.3134	0.7506	0.0000	0.0374	0.0000

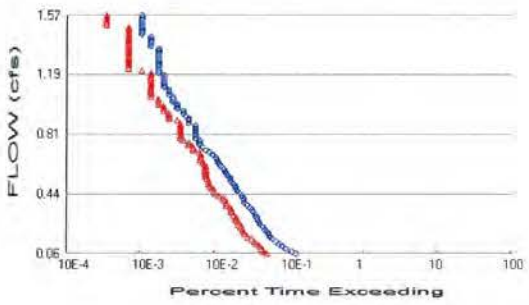
6.8819	0.3170	0.7791	0.0000	0.0374	0.0000
6.9725	0.3206	0.8080	0.0000	0.0374	0.0000
7.0632	0.3242	0.8373	0.0000	0.0374	0.0000
7.1538	0.3278	0.8668	0.0000	0.0374	0.0000
7.2445	0.3314	0.8967	0.0000	0.0374	0.0000
7.3352	0.3351	0.9269	0.7909	0.0374	0.0000
7.4258	0.3387	0.9575	2.3428	0.0374	0.0000
7.5165	0.3424	0.9883	4.3596	0.0374	0.0000
7.6071	0.3461	1.0195	6.7280	0.0374	0.0000
7.6978	0.3498	1.0511	9.3612	0.0374	0.0000
7.7885	0.3535	1.0830	12.177	0.0374	0.0000
7.8791	0.3572	1.1152	15.091	0.0374	0.0000
7.9698	0.3609	1.1477	18.017	0.0374	0.0000
8.0604	0.3647	1.1806	20.869	0.0374	0.0000
8.1511	0.3684	1.2138	23.565	0.0374	0.0000
8.2418	0.3722	1.2474	26.032	0.0374	0.0000
8.2500	0.3725	1.2505	28.212	0.0374	0.0000

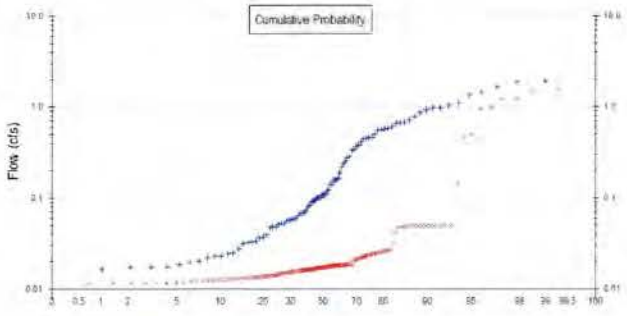
Surface Biofilter 2

Element Flows To:

Outlet 1	Outlet 2
	Biofilter 2

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 5.61
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.02
Total Impervious Area: 3.59

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.605958
5 year	1.066418
10 year	1.567726
25 year	1.875636

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.048954
5 year	0.580303
10 year	1.216318
25 year	1.539163

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0606	357	143	40	Pass
0.0758	306	131	42	Pass
0.0910	262	124	47	Pass
0.1063	229	114	49	Pass
0.1215	209	107	51	Pass
0.1367	192	98	51	Pass
0.1519	173	90	52	Pass
0.1672	159	80	50	Pass
0.1824	152	73	48	Pass
0.1976	143	70	48	Pass
0.2128	134	68	50	Pass
0.2281	128	66	51	Pass
0.2433	118	62	52	Pass
0.2585	114	60	52	Pass
0.2737	108	56	51	Pass
0.2889	105	56	53	Pass
0.3042	101	52	51	Pass
0.3194	96	49	51	Pass
0.3346	93	48	51	Pass
0.3498	86	47	54	Pass
0.3651	81	42	51	Pass
0.3803	73	42	57	Pass
0.3955	71	39	54	Pass
0.4107	69	38	55	Pass
0.4260	66	33	50	Pass
0.4412	63	30	47	Pass
0.4564	59	29	49	Pass
0.4716	56	27	48	Pass
0.4869	54	25	46	Pass
0.5021	51	24	47	Pass
0.5173	48	24	50	Pass
0.5325	47	23	48	Pass
0.5477	44	22	50	Pass
0.5630	42	22	52	Pass
0.5782	40	22	55	Pass
0.5934	39	22	56	Pass
0.6086	35	22	62	Pass
0.6239	34	21	61	Pass
0.6391	32	20	62	Pass
0.6543	31	19	61	Pass
0.6695	30	19	63	Pass
0.6848	27	19	70	Pass
0.7000	25	18	72	Pass
0.7152	22	15	68	Pass
0.7304	20	15	75	Pass
0.7457	18	13	72	Pass
0.7609	18	13	72	Pass
0.7761	18	11	61	Pass
0.7913	16	10	62	Pass
0.8065	16	10	62	Pass
0.8218	16	10	62	Pass
0.8370	16	10	62	Pass
0.8522	16	10	62	Pass

0.8674	16	10	62	Pass
0.8827	13	10	76	Pass
0.8979	13	9	69	Pass
0.9131	13	7	53	Pass
0.9283	12	7	58	Pass
0.9436	11	7	63	Pass
0.9588	11	6	54	Pass
0.9740	9	6	66	Pass
0.9892	9	6	66	Pass
1.0045	9	5	55	Pass
1.0197	8	5	62	Pass
1.0349	8	5	62	Pass
1.0501	8	4	50	Pass
1.0653	7	4	57	Pass
1.0806	7	4	57	Pass
1.0958	7	4	57	Pass
1.1110	6	4	66	Pass
1.1262	6	4	66	Pass
1.1415	6	4	66	Pass
1.1567	6	4	66	Pass
1.1719	6	4	66	Pass
1.1871	6	4	66	Pass
1.2024	5	4	80	Pass
1.2176	5	3	60	Pass
1.2328	5	2	40	Pass
1.2480	5	2	40	Pass
1.2633	5	2	40	Pass
1.2785	5	2	40	Pass
1.2937	5	2	40	Pass
1.3089	5	2	40	Pass
1.3241	5	2	40	Pass
1.3394	5	2	40	Pass
1.3546	5	2	40	Pass
1.3698	4	2	50	Pass
1.3850	4	2	50	Pass
1.4003	4	2	50	Pass
1.4155	4	2	50	Pass
1.4307	4	2	50	Pass
1.4459	3	2	66	Pass
1.4612	3	2	66	Pass
1.4764	3	2	66	Pass
1.4916	3	2	66	Pass
1.5068	3	1	33	Pass
1.5221	3	1	33	Pass
1.5373	3	1	33	Pass
1.5525	3	1	33	Pass
1.5677	3	1	33	Pass

Water Quality

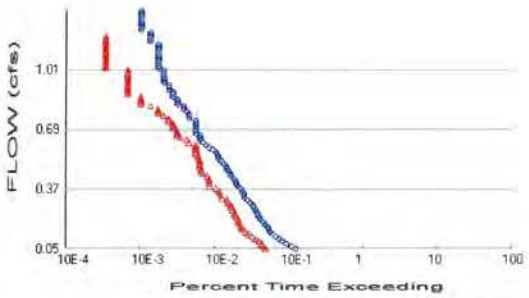
Drawdown Time Results

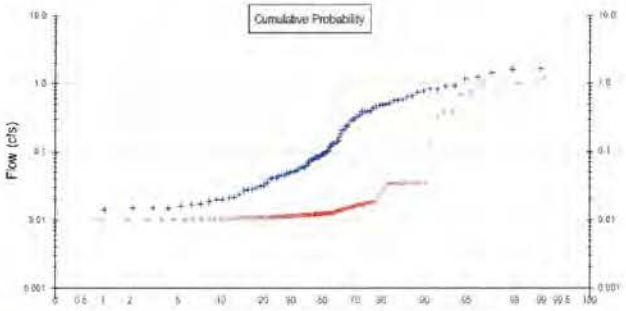
Pond: Surface Biofilter 1

Days	Stage(feet)	Percent of Total Run Time
1	N/A	100.00
2	N/A	100.00
3	N/A	100.00
4	N/A	100.00
5	N/A	100.00

Maximum Stage: 2.000 Drawdown Time: Less than 1 day

POC 2





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 4.78
Total Impervious Area: 0

Mitigated Landuse Totals for POC #2
Total Pervious Area: 2.16
Total Impervious Area: 2.62

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	0.516306
5 year	0.908641
10 year	1.33578
25 year	1.598135

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	0.033578
5 year	0.445888
10 year	0.814807
25 year	1.103909

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0516	357	137	38	Pass
0.0646	306	129	42	Pass
0.0776	264	122	46	Pass
0.0905	230	112	48	Pass
0.1035	209	100	47	Pass
0.1165	192	92	47	Pass
0.1295	173	81	46	Pass
0.1424	160	74	46	Pass
0.1554	152	67	44	Pass
0.1684	143	65	45	Pass
0.1813	134	63	47	Pass
0.1943	128	61	47	Pass
0.2073	118	59	50	Pass
0.2203	113	55	48	Pass
0.2332	108	53	49	Pass
0.2462	105	53	50	Pass
0.2592	101	50	49	Pass
0.2721	96	47	48	Pass
0.2851	93	47	50	Pass
0.2981	86	44	51	Pass
0.3111	81	43	53	Pass
0.3240	73	37	50	Pass
0.3370	71	35	49	Pass
0.3500	69	34	49	Pass
0.3629	66	33	50	Pass
0.3759	63	30	47	Pass
0.3889	59	25	42	Pass
0.4019	56	24	42	Pass
0.4148	54	24	44	Pass
0.4278	51	24	47	Pass
0.4408	48	23	47	Pass
0.4537	47	20	42	Pass
0.4667	44	19	43	Pass
0.4797	42	19	45	Pass
0.4927	41	18	43	Pass
0.5056	39	18	46	Pass
0.5186	35	18	51	Pass
0.5316	34	18	52	Pass
0.5445	32	17	53	Pass
0.5575	31	17	54	Pass
0.5705	30	16	53	Pass
0.5835	27	16	59	Pass
0.5964	24	16	66	Pass
0.6094	22	16	72	Pass
0.6224	20	13	65	Pass
0.6353	18	12	66	Pass
0.6483	18	10	55	Pass
0.6613	18	9	50	Pass
0.6742	16	9	56	Pass
0.6872	16	9	56	Pass
0.7002	16	8	50	Pass
0.7132	16	8	50	Pass
0.7261	16	8	50	Pass

0.7391	16	7	43	Pass
0.7521	13	7	53	Pass
0.7650	13	6	46	Pass
0.7780	13	5	38	Pass
0.7910	12	5	41	Pass
0.8040	11	5	45	Pass
0.8169	11	4	36	Pass
0.8299	9	3	33	Pass
0.8429	9	3	33	Pass
0.8558	9	3	33	Pass
0.8688	8	3	37	Pass
0.8818	8	2	25	Pass
0.8948	8	2	25	Pass
0.9077	7	2	28	Pass
0.9207	7	2	28	Pass
0.9337	7	2	28	Pass
0.9466	6	2	33	Pass
0.9596	6	2	33	Pass
0.9726	6	2	33	Pass
0.9856	6	2	33	Pass
0.9985	6	2	33	Pass
1.0115	6	2	33	Pass
1.0245	5	1	20	Pass
1.0374	5	1	20	Pass
1.0504	5	1	20	Pass
1.0634	5	1	20	Pass
1.0764	5	1	20	Pass
1.0893	5	1	20	Pass
1.1023	5	1	20	Pass
1.1153	5	1	20	Pass
1.1282	5	1	20	Pass
1.1412	5	1	20	Pass
1.1542	5	1	20	Pass
1.1672	4	1	25	Pass
1.1801	4	1	25	Pass
1.1931	4	1	25	Pass
1.2061	4	0	0	Pass
1.2190	4	0	0	Pass
1.2320	3	0	0	Pass
1.2450	3	0	0	Pass
1.2580	3	0	0	Pass
1.2709	3	0	0	Pass
1.2839	3	0	0	Pass
1.2969	3	0	0	Pass
1.3098	3	0	0	Pass
1.3228	3	0	0	Pass
1.3358	3	0	0	Pass

Water Quality

Drawdown Time Results

Pond: Surface Biofilter 2

Days	Stage(feet)	Percent of Total Run Time
1	N/A	100.00
2	N/A	100.00
3	N/A	100.00
4	N/A	100.00
5	N/A	100.00

Maximum Stage: 2.000 Drawdown Time: Less than 1 day

Model Default Modifications

Total of 0 changes have been made.

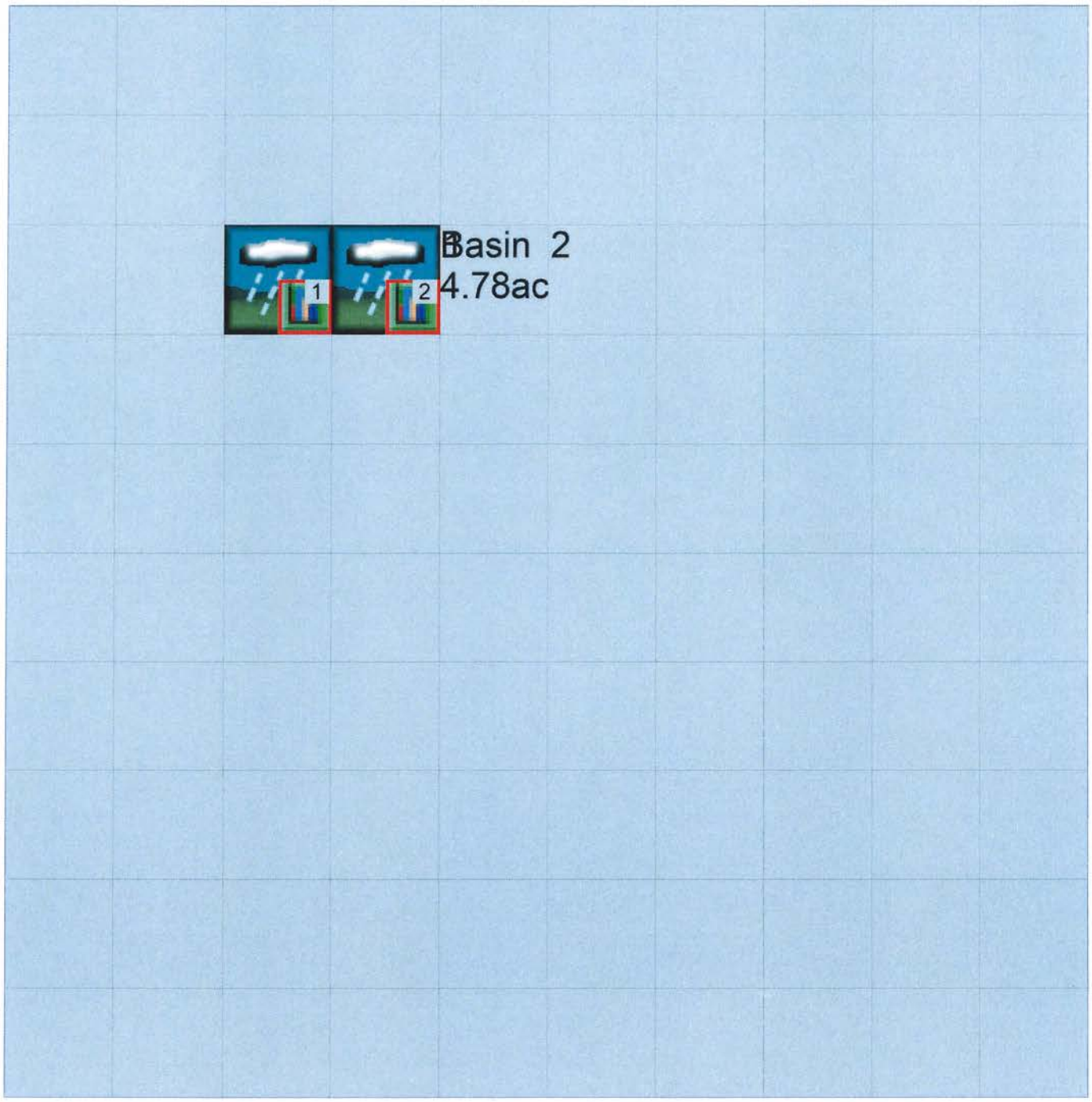
PERLND Changes

No PERLND changes have been made.

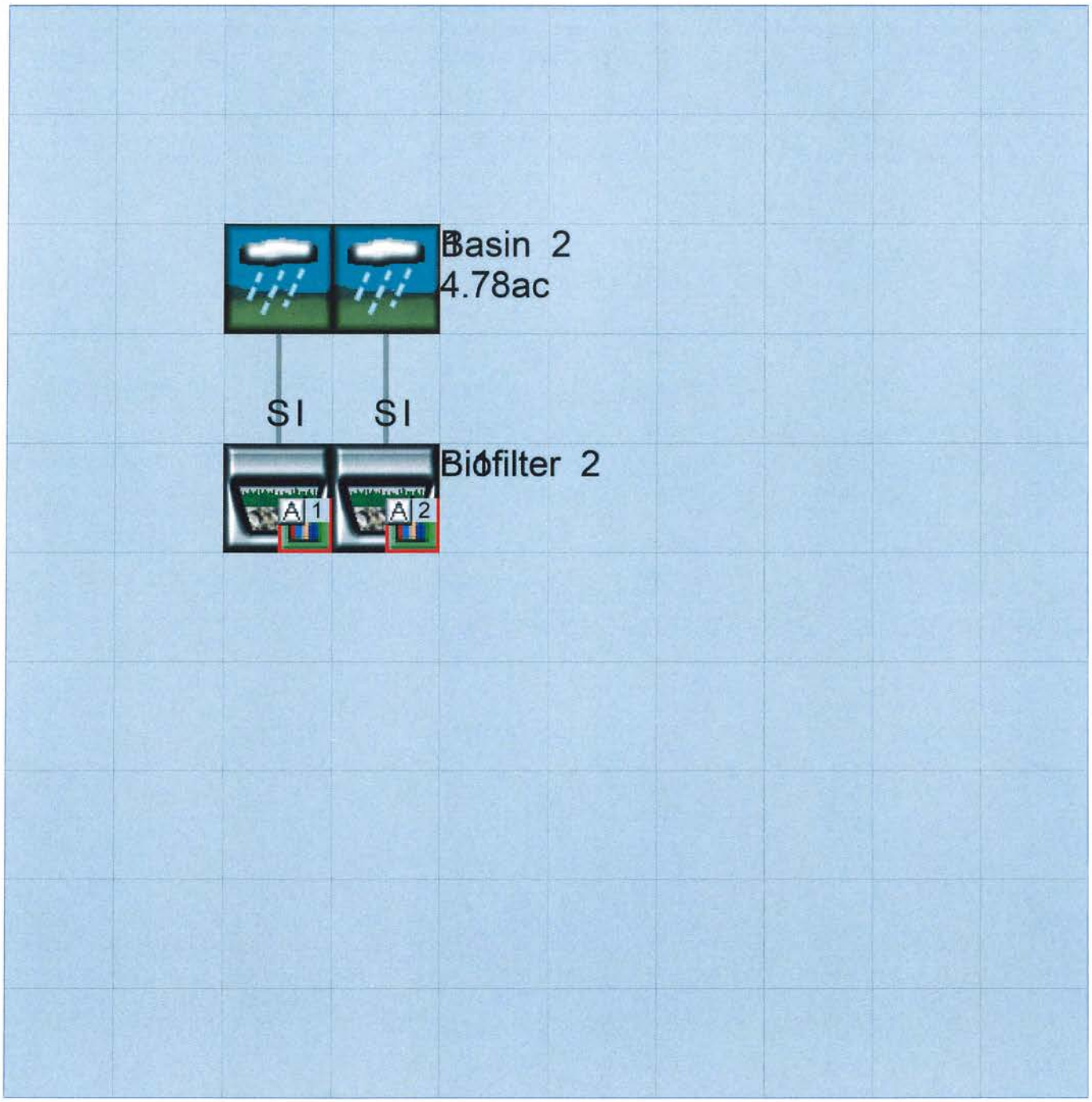
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



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   18-062.wdm
MESSU       25   Mit18-062.MES
            27   Mit18-062.L61
            28   Mit18-062.L62
            30   POC18-0621.dat
            31   POC18-0622.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND       29
      IMPLND        2
      RCHRES        1
      RCHRES        2
      RCHRES        3
      RCHRES        4
      COPY          1
      COPY        501
      COPY          2
      COPY        502
      DISPLY        1
      DISPLY        2
    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
    2         Surface Biofilter  2        MAX                   1    2   31    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -   #  NPT  NMN ***
    1          1    1
  501          1    1
    2          1    1
  502          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             ***
    2      IMPERVIOUS-MOD         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -   # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    2         0    0    1    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    2         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      ***
    2         0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >       IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2           100       0.1     0.011      0.08
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >       IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  29                       2.02     RCHRES   1      2
PERLND  29                       2.02     RCHRES   1      3
IMPLND   2                       3.59     RCHRES   1      5
Basin  2***
PERLND  29                       2.16     RCHRES   3      2
PERLND  29                       2.16     RCHRES   3      3
IMPLND   2                       2.62     RCHRES   3      5

******Routing******
PERLND  29                       2.02     COPY     1     12
IMPLND   2                       3.59     COPY     1     15
PERLND  29                       2.02     COPY     1     13
RCHRES   1                          1     RCHRES   2      8
PERLND  29                       2.16     COPY     2     12
IMPLND   2                       2.62     COPY     2     15
PERLND  29                       2.16     COPY     2     13
RCHRES   3                          1     RCHRES   4      8
RCHRES   2                          1     COPY   501     17
RCHRES   1                          1     COPY   501     17
RCHRES   4                          1     COPY   502     17
RCHRES   3                          1     COPY   502     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
COPY   502 OUTPUT MEAN   1 1   12.1        DISPLY   2     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                            ***
    1     Surface Biofilte-004    3    1    1    1   28    0    1
    2     Biofilter  1            2    1    1    1   28    0    1
    3     Surface Biofilte-008    3    1    1    1   28    0    1
    4     Biofilter  2            2    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
    3         1    0    0    0    0    0    0    0    0    0
    4         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
    3         4    0    0    0    0    0    0    0    0    0    1    9
    4         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  0  0  0  0       2  2  2  2  2
    2        0  1  0  0   4  5  0  0  0      0  0  0  0  0       2  2  2  2  2
    3        0  1  0  0   4  5  6  0  0      0  0  0  0  0       2  2  2  2  2
    4        0  1  0  0   4  5  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     697.0       0.0       0.0
    2              2      0.04       0.0     697.0       0.0       0.0
    3              3      0.01       0.0     696.0       0.0       0.0
    4              4      0.03       0.0     696.0       0.0       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  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3             0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    4             0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   59    5
     Depth      Area     Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)    (acres) (acre-ft)    (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.300890  0.000000  0.000000  0.000000
```

```
  0.090659  0.297421  0.002826  0.000000  0.000000
  0.181319  0.293619  0.005735  0.000000  0.000000
  0.271978  0.289831  0.008727  0.000000  0.000000
  0.362637  0.286056  0.011803  0.000000  0.000000
  0.453297  0.282295  0.014963  0.000000  0.002410
  0.543956  0.278547  0.018207  0.000000  0.003892
  0.634615  0.274813  0.021536  0.000000  0.003892
  0.725275  0.271092  0.024950  0.000000  0.003892
  0.815934  0.267385  0.028450  0.000000  0.003892
  0.906593  0.263692  0.032036  0.000000  0.003892
  0.997253  0.260012  0.035707  0.000000  0.003892
  1.087912  0.256346  0.039466  0.000000  0.003892
  1.178571  0.252694  0.043311  0.000000  0.003892
  1.269231  0.249055  0.047243  0.000000  0.003892
  1.359890  0.245429  0.051264  0.001826  0.003892
  1.450549  0.241817  0.055372  0.002739  0.003892
  1.541209  0.238219  0.059569  0.004351  0.003892
  1.631868  0.234634  0.063855  0.005158  0.003892
  1.722527  0.231063  0.068229  0.006379  0.003892
  1.813187  0.227506  0.072694  0.006989  0.003892
  1.903846  0.223962  0.077248  0.007965  0.003892
  1.994505  0.220432  0.081893  0.008452  0.003892
  2.085165  0.216915  0.086628  0.009278  0.003892
  2.175824  0.213412  0.091454  0.009690  0.003892
  2.266484  0.209922  0.096372  0.010417  0.003892
  2.357143  0.206446  0.101381  0.010781  0.003892
  2.447802  0.202984  0.106483  0.011438  0.003892
  2.538462  0.199535  0.111677  0.011767  0.003892
  2.629121  0.196100  0.116964  0.012372  0.003892
  2.719780  0.192678  0.122344  0.012674  0.003892
  2.810440  0.189270  0.127818  0.013238  0.003892
  2.901099  0.185875  0.133386  0.013520  0.003892
  2.991758  0.182495  0.139048  0.014050  0.003892
  3.082418  0.179127  0.144805  0.014315  0.003892
  3.173077  0.175774  0.150657  0.014816  0.003892
  3.263736  0.172433  0.158884  0.015067  0.003892
  3.354396  0.169107  0.167244  0.015545  0.003892
  3.445055  0.165794  0.175737  0.015783  0.003892
  3.535714  0.162495  0.184363  0.016240  0.003892
  3.626374  0.159209  0.193124  0.016468  0.003892
  3.717033  0.155937  0.202019  0.016906  0.003892
  3.807692  0.152678  0.211049  0.017125  0.003892
  3.898352  0.149433  0.220215  0.017547  0.003892
  3.989011  0.146201  0.229517  0.017758  0.003892
  4.079670  0.142984  0.238956  0.018011  0.003892
  4.170330  0.139779  0.248532  0.018138  0.003892
  4.260989  0.136589  0.258246  0.018498  0.003892
  4.351648  0.133411  0.268098  0.019195  0.003892
  4.442308  0.130248  0.278088  0.020084  0.003892
  4.532967  0.127098  0.288218  0.021041  0.003892
  4.623626  0.123962  0.298487  0.022010  0.003892
  4.714286  0.120839  0.308897  0.022965  0.003892
  4.804945  0.117730  0.319448  0.023896  0.003892
  4.895604  0.114634  0.330139  0.024798  0.003892
  4.986264  0.111552  0.340973  0.025673  0.003892
  5.076923  0.108484  0.351949  0.026523  0.003892
  5.167582  0.105429  0.363067  0.027350  0.003892
  5.250000  0.102388  0.377683  0.049151  0.003892
  END FTABLE  2
  FTABLE      1
   35    6
     Depth       Area     Volume  Outflow1  Outflow2  Outflow3  Velocity  Travel
Time***
      (ft)    (acres) (acre-ft)    (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.102388  0.000000  0.000000  0.000000  0.000000
  0.090659  0.304718  0.027452  0.000000  0.053043  0.000000
  0.181319  0.308559  0.055252  0.000000  0.053043  0.000000
  0.271978  0.312414  0.083400  0.000000  0.053043  0.000000
  0.362637  0.316283  0.111899  0.000000  0.053043  0.000000
```

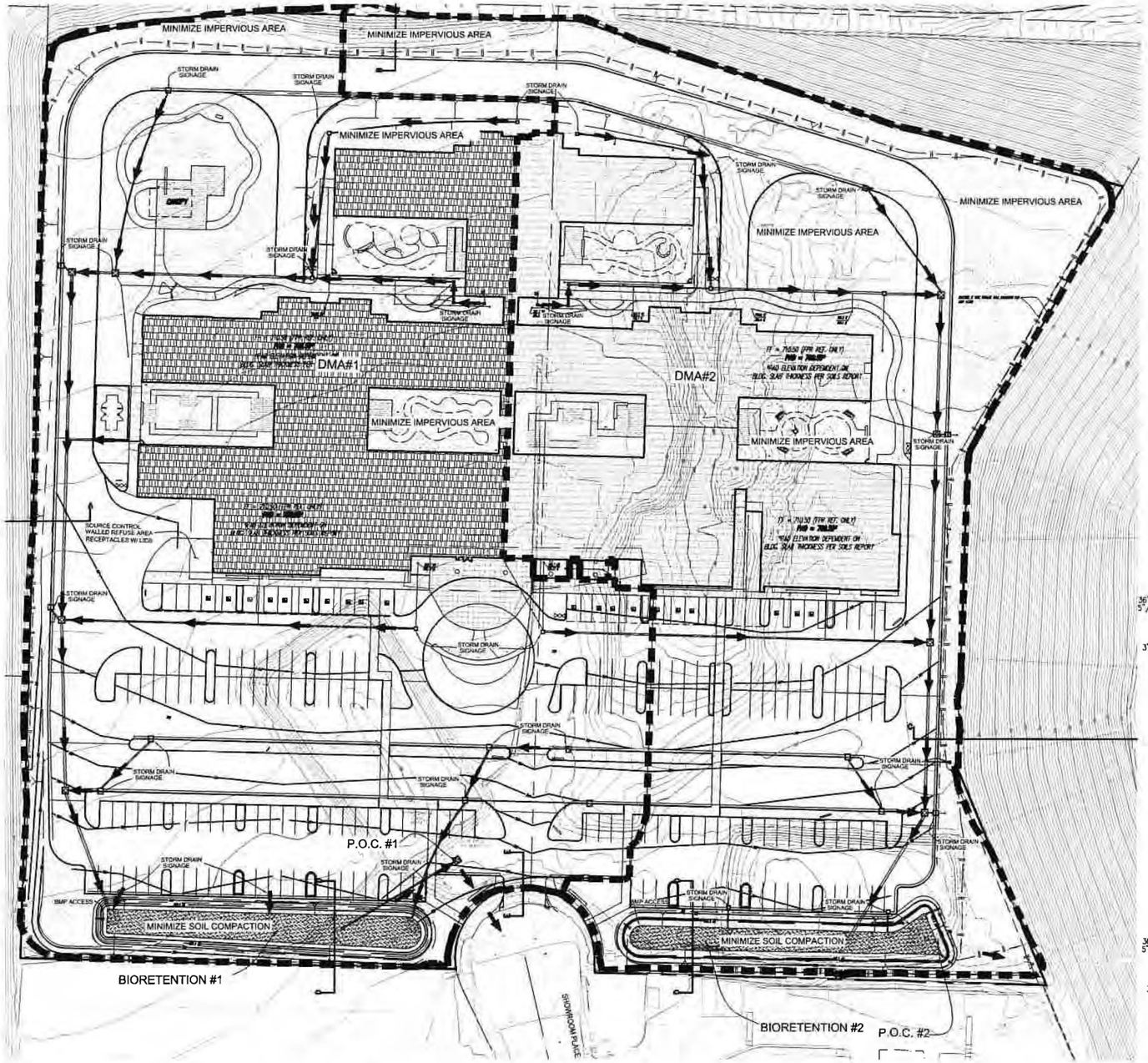
```
0.453297  0.320165  0.140749  0.000000  0.053043  0.000000
0.543956  0.324061  0.169951  0.000000  0.053043  0.000000
0.634615  0.327971  0.199508  0.000000  0.053043  0.000000
0.725275  0.331894  0.229419  0.000000  0.053043  0.000000
0.815934  0.335830  0.259687  0.000000  0.053043  0.000000
0.906593  0.339781  0.290312  0.000000  0.053043  0.000000
0.997253  0.343744  0.321296  0.000000  0.053043  0.000000
1.087912  0.347722  0.352640  0.000000  0.053043  0.000000
1.178571  0.351713  0.384345  0.000000  0.053043  0.000000
1.269231  0.355717  0.416413  0.000000  0.053043  0.000000
1.359890  0.359736  0.448844  0.000000  0.053043  0.000000
1.450549  0.363767  0.481640  0.000000  0.053043  0.000000
1.541209  0.367813  0.514802  0.000000  0.053043  0.000000
1.631868  0.371872  0.548332  0.000000  0.053043  0.000000
1.722527  0.375944  0.582230  0.000000  0.053043  0.000000
1.813187  0.380030  0.616498  0.000000  0.053043  0.000000
1.903846  0.384130  0.651137  0.000000  0.053043  0.000000
1.994505  0.388243  0.686149  0.000000  0.053043  0.000000
2.085165  0.392370  0.721534  0.790872  0.053043  0.000000
2.175824  0.396510  0.757294  2.342816  0.053043  0.000000
2.266484  0.400664  0.793429  4.359603  0.053043  0.000000
2.357143  0.404832  0.829942  6.728010  0.053043  0.000000
2.447802  0.409013  0.866833  9.361249  0.053043  0.000000
2.538462  0.413208  0.904104  12.17685  0.053043  0.000000
2.629121  0.417416  0.941756  15.09073  0.053043  0.000000
2.719780  0.421638  0.979790  18.01672  0.053043  0.000000
2.810440  0.425874  1.018208  20.86880  0.053043  0.000000
2.901099  0.430123  1.057010  23.56490  0.053043  0.000000
2.991758  0.434386  1.096198  26.03191  0.053043  0.000000
3.000000  0.434774  1.099780  28.21160  0.053043  0.000000
END FTABLE  1
FTABLE      4
 59    5
   Depth      Area     Volume   Outflow1   Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)     (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.254781  0.000000  0.000000  0.000000
0.090659  0.251755  0.002332  0.000000  0.000000
0.181319  0.248440  0.004735  0.000000  0.000000
0.271978  0.245139  0.007207  0.000000  0.000000
0.362637  0.241851  0.009749  0.000000  0.000000
0.453297  0.238577  0.012362  0.000000  0.001989
0.543956  0.235316  0.015047  0.000000  0.003220
0.634615  0.232069  0.017803  0.000000  0.003220
0.725275  0.228835  0.020631  0.000000  0.003220
0.815934  0.225616  0.023531  0.000000  0.003220
0.906593  0.222409  0.026503  0.000000  0.003220
0.997253  0.219216  0.029549  0.000000  0.003220
1.087912  0.216037  0.032668  0.000000  0.003220
1.178571  0.212872  0.035860  0.000000  0.003220
1.269231  0.209720  0.039127  0.000000  0.003220
1.359890  0.206581  0.042468  0.001268  0.003220
1.450549  0.203456  0.045884  0.001902  0.003220
1.541209  0.200345  0.049376  0.003022  0.003220
1.631868  0.197248  0.052943  0.003582  0.003220
1.722527  0.194163  0.056585  0.004430  0.003220
1.813187  0.191093  0.060304  0.004854  0.003220
1.903846  0.188036  0.064100  0.005531  0.003220
1.994505  0.184993  0.067973  0.005870  0.003220
2.085165  0.181963  0.071923  0.006443  0.003220
2.175824  0.178947  0.075951  0.006729  0.003220
2.266484  0.175944  0.080057  0.007234  0.003220
2.357143  0.172955  0.084242  0.007487  0.003220
2.447802  0.169980  0.088505  0.007943  0.003220
2.538462  0.167018  0.092848  0.008171  0.003220
2.629121  0.164070  0.097271  0.008592  0.003220
2.719780  0.161135  0.101773  0.008802  0.003220
2.810440  0.158214  0.106356  0.009193  0.003220
2.901099  0.155307  0.111019  0.009389  0.003220
2.991758  0.152413  0.115764  0.009757  0.003220
3.082418  0.149533  0.120590  0.009941  0.003220
```

```
   3.173077  0.146666  0.125498  0.010289  0.003220
   3.263736  0.143813  0.132401  0.010463  0.003220
   3.354396  0.140973  0.139419  0.010795  0.003220
   3.445055  0.138147  0.146551  0.010961  0.003220
   3.535714  0.135335  0.153798  0.011278  0.003220
   3.626374  0.132536  0.161161  0.011436  0.003220
   3.717033  0.129751  0.168641  0.011741  0.003220
   3.807692  0.126979  0.176237  0.011893  0.003220
   3.898352  0.124221  0.183950  0.012186  0.003220
   3.989011  0.121477  0.191782  0.012332  0.003220
   4.079670  0.118746  0.199732  0.012508  0.003220
   4.170330  0.116029  0.207800  0.012596  0.003220
   4.260989  0.113325  0.215988  0.012846  0.003220
   4.351648  0.110635  0.224296  0.013330  0.003220
   4.442308  0.107958  0.232724  0.013947  0.003220
   4.532967  0.105296  0.241273  0.014612  0.003220
   4.623626  0.102646  0.249943  0.015285  0.003220
   4.714286  0.100010  0.258736  0.015948  0.003220
   4.804945  0.097388  0.267651  0.016594  0.003220
   4.895604  0.094780  0.276688  0.017221  0.003220
   4.986264  0.092185  0.285849  0.017829  0.003220
   5.076923  0.089603  0.295135  0.018419  0.003220
   5.167582  0.087035  0.304544  0.018993  0.003220
   5.250000  0.084481  0.316294  0.034132  0.003220
  END FTABLE  4
  FTABLE      3
   35    6
     Depth       Area     Volume   Outflow1   Outflow2   Outflow3  Velocity  Travel
Time***
      (ft)    (acres) (acre-ft)    (cfs)      (cfs)      (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.084481  0.000000  0.000000  0.000000  0.000000
  0.090659  0.258122  0.023250  0.000000  0.037352  0.000000
  0.181319  0.261476  0.046803  0.000000  0.037352  0.000000
  0.271978  0.264844  0.070661  0.000000  0.037352  0.000000
  0.362637  0.268226  0.094825  0.000000  0.037352  0.000000
  0.453297  0.271621  0.119296  0.000000  0.037352  0.000000
  0.543956  0.275030  0.144075  0.000000  0.037352  0.000000
  0.634615  0.278453  0.169165  0.000000  0.037352  0.000000
  0.725275  0.281889  0.194565  0.000000  0.037352  0.000000
  0.815934  0.285338  0.220277  0.000000  0.037352  0.000000
  0.906593  0.288802  0.246303  0.000000  0.037352  0.000000
  0.997253  0.292278  0.272643  0.000000  0.037352  0.000000
  1.087912  0.295769  0.299299  0.000000  0.037352  0.000000
  1.178571  0.299273  0.326272  0.000000  0.037352  0.000000
  1.269231  0.302790  0.353563  0.000000  0.037352  0.000000
  1.359890  0.306322  0.381174  0.000000  0.037352  0.000000
  1.450549  0.309866  0.409106  0.000000  0.037352  0.000000
  1.541209  0.313425  0.437359  0.000000  0.037352  0.000000
  1.631868  0.316997  0.465936  0.000000  0.037352  0.000000
  1.722527  0.320582  0.494837  0.000000  0.037352  0.000000
  1.813187  0.324181  0.524064  0.000000  0.037352  0.000000
  1.903846  0.327794  0.553618  0.000000  0.037352  0.000000
  1.994505  0.331420  0.583500  0.000000  0.037352  0.000000
  2.085165  0.335060  0.613711  0.790872  0.037352  0.000000
  2.175824  0.338713  0.644253  2.342816  0.037352  0.000000
  2.266484  0.342380  0.675127  4.359603  0.037352  0.000000
  2.357143  0.346061  0.706334  6.728010  0.037352  0.000000
  2.447802  0.349755  0.737875  9.361249  0.037352  0.000000
  2.538462  0.353463  0.769751  12.17685  0.037352  0.000000
  2.629121  0.357184  0.801965  15.09073  0.037352  0.000000
  2.719780  0.360919  0.834516  18.01672  0.037352  0.000000
  2.810440  0.364668  0.867407  20.86880  0.037352  0.000000
  2.901099  0.368430  0.900638  23.56490  0.037352  0.000000
  2.991758  0.372205  0.934211  26.03191  0.037352  0.000000
  3.000000  0.372549  0.937280  28.21160  0.037352  0.000000
  END FTABLE  3
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      2 PREC     ENGL    1              RCHRES   1     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES   3     EXTNL  PREC
WDM      1 EVAP     ENGL    0.5            RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   2     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   3     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   4     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   O      1 1         1     WDM   1001 FLOW     ENGL       REPL
RCHRES   2 HYDR   O      2 1         1     WDM   1002 FLOW     ENGL       REPL
RCHRES   2 HYDR   STAGE  1 1         1     WDM   1003 STAG     ENGL       REPL
RCHRES   1 HYDR   STAGE  1 1         1     WDM   1004 STAG     ENGL       REPL
RCHRES   1 HYDR   O      1 1         1     WDM   1005 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
RCHRES   4 HYDR   RO     1 1         1     WDM   1006 FLOW     ENGL       REPL
RCHRES   4 HYDR   O      1 1         1     WDM   1010 FLOW     ENGL       REPL
RCHRES   4 HYDR   O      2 1         1     WDM   1011 FLOW     ENGL       REPL
RCHRES   4 HYDR   STAGE  1 1         1     WDM   1007 STAG     ENGL       REPL
RCHRES   3 HYDR   STAGE  1 1         1     WDM   1008 STAG     ENGL       REPL
RCHRES   3 HYDR   O      1 1         1     WDM   1009 FLOW     ENGL       REPL
COPY     2 OUTPUT MEAN   1 1      12.1     WDM    702 FLOW     ENGL       REPL
COPY   502 OUTPUT MEAN   1 1      12.1     WDM    802 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         17
RCHRES      OFLOW  OVOL   1                 COPY            INPUT  MEAN
  END MASS-LINK     17
```

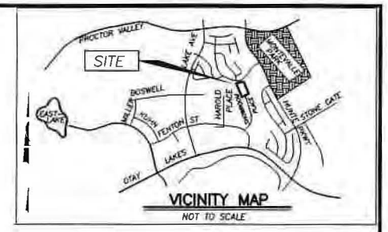
```
END MASS-LINK

END RUN
```

APPENDIX B -
HMP EXHIBIT



LEGEND

FEATURE	SYMBOL
SURFACE FLOW	→ →
DRAINAGE STRUCTURE FLOW	⇨ ⇨
DRAINAGE MANAGEMENT AREA (TRIBUTARY TO BIOFILTRATION)	
PROPOSED AC PAVEMENT	
PROPOSED P C C	
PROPOSED ROOF	
PROPOSED LANDSCAPED AREA WITH DROUGHT TOLERANT SPECIES	
PROPOSED BIOFILTRATION AREA (TREATMENT CONTROL)	
PROPOSED TREE WELL	
ROOF DRAIN	RD



NO DUMPING GOES TO OCEAN — think BLUE — NO TIRAR BASURA LLEGA AL MAR

1. THESE ARE SAMPLE TILES AND SIGNS
2. CITY ENGINEER TO DESIGNATE OR APPROVE SIGNS, TILES OR STENCILS.
3. PROVIDE LABELING WITH PROHIBITIVE LANGUAGE ("NO DUMPING GOES TO OCEAN – NO TIRAR BASURA LLEGA AL MAR")
4. SIGN SHOULD BE PLACED ON THE CATCH BASIN GRATE.
5. SIGN SHALL HAVE A WHITE BACKGROUND WITH BLUE LETTERING.

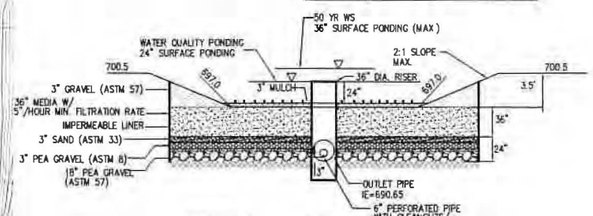
STORM DRAIN SIGNAGE
NOT TO SCALE

AREAS DRAINING TO BIOFILTRATION BASIN #1 (DMA #1)

POST-PROJECT SURFACE TYPE	DMA AREA (SF)	DMA RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	IMP SIZING FACTOR (WM ONLY)	MIN AREA (S.F.)	PROPOSED AREA (S.F.)
ROOF AND PAVEMENT	156,292	0.9	140,663			
LANDSCAPE	87,991	0.1	8,799			
TOTAL DMA AREA=	244,283 SF		149,462	0.03	4,484	7,456

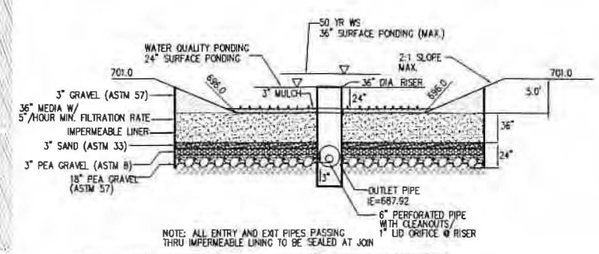
AREAS DRAINING TO BIOFILTRATION BASIN #2 (DMA #2)

POST-PROJECT SURFACE TYPE	DMA AREA (SF)	DMA RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	IMP SIZING FACTOR (WM ONLY)	MIN AREA (S.F.)	PROPOSED AREA (S.F.)
ROOF AND PAVEMENT	114,202	0.9	102,182			
LANDSCAPE	94,170	0.1	9,417			
TOTAL DMA AREA=	208,372 SF		111,599	0.03	3,348	6,690



BMP	H (IN)	LID ORIFICE (IN)	AREA (BMP) FT²	AREA (TOP) FT²	TOTAL SURFACE DEPTH FT	DESIGN VOLUME CF
1	24	0.9	7,456	8,495	3.5	6,572

BMP1- BIOFILTRATION WITH PARTIAL INFILTRATION PR-1
NOT TO SCALE



BMP	H (IN)	LID ORIFICE (IN)	AREA (BMP) FT²	AREA (TOP) FT²	TOTAL SURFACE DEPTH FT	DESIGN VOLUME CF
2	24	0.75	6,690	9,497	5.0	4,874

BMP2- BIOFILTRATION WITH PARTIAL INFILTRATION PR-1
NOT TO SCALE

K&S ENGINEERING, INC.
Planning Engineering Surveying
7801 Mission Center Court, Suite 100 San Diego, CA 92108
(619) 296-5565 Fax: (619) 296-5564

REGISTERED PROFESSIONAL ENGINEER KAMAL S. SWAIS No. 48592 EXP. 6/30/20 CIVIL STATE OF CALIFORNIA

GROUNDWATER

ACCORDING TO THE UPDATED GEOTECHNICAL EVALUATION REPORT PREPARED BY NINYO AND MOORE DATED MARCH 6, 2019; NO GROUND WATER WAS OBSERVED IN THE SUBSURFACE EXPLORATIONS AT AT DEPTH OF 46 FEET.

CCSYA NOTE:

PROJECT IS NOT WITHIN OR DOESN'T RECEIVE OR DRAINS FROM CRITICAL COARSE SEDIMENT YIELD AREAS. SEE ATTACHMENT 2b

BMP CATEGORY/TYPE

BIOFILTRATION PR-1

UNDERLAYING SOIL GROUP

ACCORDING TO THE NATIONAL COOPERATIVE SOIL SURVEY (USDA) THE UNDERLAYING SOIL CONSISTS OF SOIL TYPE D.

TOTAL SITE AREA

454,330 SQ FT.

TOTAL DISTURBED AREA

427,759 SQ FT.

HYDROMODIFICATION MANAGEMENT (HMP)
ATTACHMENT 2a

DMA SHEET FOR:

ACADIA HEALTH CARE

SHEET 1 OF 1