APPENDIX 3.1.2-2

Major Stormwater Management Plan

County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

OTAY RANCH- VILLAGE 14
AND PLANNING AREAS 16/19
PDS2016-MPA-16-007

Proctor Valley Road between Jamul and Chula Vista
County of San Diego, CA 91935

ASSESSOR'S PARCEL NUMBER(S):
598-070-07 & 09, 598-010-02, 598-020-04 & 06, 598-021-02,
597-140-05, 597-140-04, 597-020-06 & 10, 597-190-23, and 597-150-03, 07, 08, 12 & 13

ENGINEER OF WORK:

Alisa S. Vialpando

Alisa S. Vialpando, Vice President, RCE #47945

PREPARED FOR:

Jackson-Pendo Development Company
2245 San Diego Avenue, Suite 223
San Diego, CA 92110]
(619) 267-4904

PDP SWQMP PREPARED BY:

Hunsaker & Associates San Diego, Inc.
9707 Waples
San Diego, CA 92121
(858) 558-4500

DATE OF SWQMP:
February 5, 2018

PLANS PREPARED BY:
Alisa S. Vialpando
9707 Waples
San Diego, CA 92121
(858) 558-4500

SWQMP APPROVED BY:

APPROVAL DATE:

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Attachments

Attachment 1: Backup for PDP Pollutant Control BMPs
- Attachment 1a: Storm Water Pollutant Control Worksheet Calculations
- Attachment 1b: DMA Exhibit
- Attachment 1c: Individual Structural BMP DMA Mapbook

Attachment 2: Backup for PDP Hydromodification Control Measures
- Attachment 2a: Flow Control Facility Design
- Attachment 2b: Hydromodification Management Exhibit
- Attachment 2c: Management of Critical Coarse Sediment Yield Areas
- Attachment 2d: Geomorphic Assessment of Receiving Channels (optional)
- Attachment 2e: Vector Control Plan (if applicable)

Attachment 3: Structural BMP Maintenance Plan
- Attachment 3a: Structural BMP Maintenance Thresholds and Actions
- Attachment 3b: Draft Maintenance Agreements / Notifications(when applicable)

Attachment 4: County of San Diego PDP Structural BMP Verification for DPW Permitted Land Development Projects

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

Attachment 6: Copy of Project's Drainage Report

Attachment 7: Copy of Project's Geotechnical and Groundwater Investigation Report

Acronyms

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
BMP DM	Best Management Practice Design Manual
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDCI	Private Development Construction Inspection Section
PDP	Priority Development Project
PDS	Planning and Development Services
PE	Professional Engineer
RPO	Resource Protection Ordinance
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WPO	Watershed Protection Ordinance
WQIP	Water Quality Improvement Plan

PDP SWQMP Preparer's Certification Page

Project Name: OTAY RANCH- VILLAGE 14 AND PLANNING AREAS 16/19
Permit Application Number: PDS2016-MPA-16-007

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the County of San Diego BMP Design Manual, which is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the County of San Diego 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 County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Alisa S. Vialpando RCE 47945, Exp 12/31/2019
Engineer of Work's Signature, PE Number & Expiration Date

Alisa S. Vialpando
Print Name

Hunsaker & Associates San Diego, Inc.
Company

2/2/18
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.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	03-23-2017	Initial Submittal
2	08-30-2017	Addressed planchecks from initial submittal. Responses are attached.
3	12-31-2017	Revised project description. Addressed planchecks attached.
4	02-05-2017	Revised project description. Added response sheet for City SD comments.

Final Design

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Otay Ranch Village 13
City of San Diego Comment Responses

M E M O R A N D U M

Date: February 1, 2018

To: Niki McGinnis, Natural Resources Manager
City of San Diego, Public Utilities Department

From: Alisa Vialpando, P.E.

Subject: **Otay Ranch- Village 14 and Planning Areas 16/19:**
Responses to City of San Diego comments (email 12/28/2017)

This memo has been prepared as response to the City of San Diego's plan review comments on the stormwater technical reports for the Otay Ranch Village 14 and Planning Areas 16/19 project. Specifically, the City was provided with the drainage study, the Stormwater Quality Management Plan (SWQMP), and the HMP Flow Control Facility Design for review. Below are the comments which were provided along with the corresponding response.

Comment 1: Although the product manufacturer has developed maintenance guidelines, the BMP maintenance program will be owned and maintained by the HOA, in perpetuity. The use of common outdoor household fertilizers and pesticides may enter the storm drain system. Depending on the load, the biofiltration system may not be able to amply bioremediate. In addition, improper maintenance of this system will likely convey pollutants to Proctor Creek which drains to Lower Otay Reservoir. If the biofiltration system is not able to bioremediate runoff, what is the remedy?
Response: In addition to the structural (biofiltration basin) BMPs, this project proposes to implement source controls BMPs intended to minimize concern from fertilizers and pesticides. For example, applicant(s) should select landscape design with native or drought tolerant species which in turn, will minimize the use of fertilizers and pesticides. Also, building designs should integrate features which would discourage entry of pests which would spur pesticide use. Operationally, new tenants/owners/operators will be provided Integrated Pest Management information via CC&Rs. The above source controls are already included in the SWQMP to be utilized on this project. Additional remedies which could be taken as necessary include an increase in maintenance frequency (removal/replacement) and/or a third party inspections to verify adequacy and compliance.

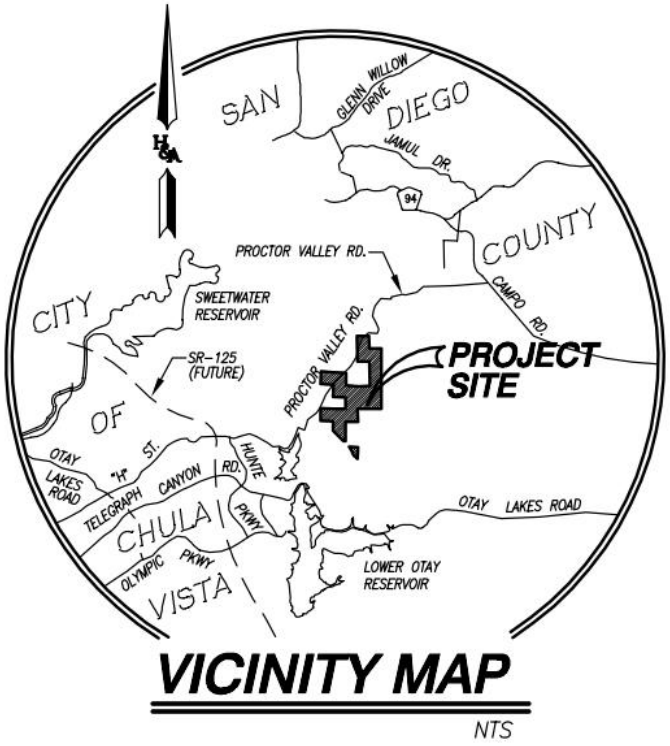
Comment 2: We have also been asked to comment on the use of recycled water. Recycled water has been known to have higher levels of total dissolved solids, nitrogen and potassium than potable water supplies which could potentially degrade the water quality of the City's drinking water supplies downstream of the project. Should recycled water be proposed as part of the project, the CEQA document should address the potential impacts to water quality.
Response: Although the City of San Diego does not currently allow recycled water on lands tributary to their reservoirs, recycled water could be considered in the future if the City of San Diego changes their policy. The Proposed Project is not proposing reclaimed water given the location above the City of San Diego's Otay Reservoir.

Should you have any questions regarding the information contained within this memo, please contact me at (858) 558-4500.

Sincerely,
Alisa S. Vialpando, R.C.E. 47945
Vice President/Principal

Project Vicinity Map

Project Name: OTAY RANCH- VILLAGE 14 AND PLANNING AREAS 16/19
Record ID: PDS2016-MPA-16-007



Step 1: Project type determination (Standard or Priority Development Project)

Is the project part of another Priority Development Project (PDP)? (☐Yes ☒ No If so, a PDP SWQMP is required. Go to Step 2.			
The project is (select one): ☒ New Development ☒ Redevelopment[1]			
The total proposed newly created or replaced impervious area is: 9,829,314 ft^2			
The total existing (pre-project) impervious area is: 302,306 ft^2			
The total area disturbed by the project is: 25,700,400 ft^2			
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. WDID: TBD			
Is the project in any of the following categories, (a) through (f)?[2]			
Yes ☒	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces[3](collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

1 Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

2 Applicants should note that any development project that will create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) is considered a new development.

3 For solar energy farm projects, the area of the solar panels does not count toward the total impervious area of the site.

Project type determination (continued)

Yes ☒	No ☐	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☒	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

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

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

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

Further guidance may be found in Chapter 1 and Table 1-2 of the BMP Design Manual.

The following is for **redevelopment PDPs only**:

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

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

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

The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

☐ greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Step 1.1: Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Complete PDP SWQMP.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

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

Step 2: Construction Storm Water BMP Checklist

Minimum Required Standard Construction Storm Water BMPs		
If you answer "Yes" to any of the questions below, your project is subject to Table 1 on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in Table 1, please select at least the minimum number of required BMPs, or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project. **Note: All selected BMPs below must be included on the BMP plan incorporated into the construction plan sets.**		
1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.) **Reference Table 1 Items A, B, D, and E** Note: Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement.	☒Yes	☐No
2. Will there be asphalt paving, including patching? **Reference Table 1 Items D and F**	☒Yes	☐No
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? **Reference Table 1 Items D and F**	☒Yes	☐No
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? **Reference Table 1 Items D and F**	☒Yes	☐No
5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? **Reference Table 1 Items D and F**	☒Yes	☐No
6. Will there be dewatering operations? **Reference Table 1 Items C and D**	☐Yes	☒No
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? **Reference Table 1 Items E and F**	☒Yes	☐No
8. Will trash or solid waste product be generated from this project? **Reference Table 1 Item F**	☒Yes	☐No
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) **Reference Table 1 Item F**	☒Yes	☐No
10. Will Portable Sanitary Services ("Porta-potty") be used on the site? **Reference Table 1 Item F**	☒Yes	☐No

Table 1. Construction Storm Water BMP Checklist

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook[4] Detail or County Std. Detail	a BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
A. Select Erosion Control Method for Disturbed Slopes (choose at least one for the appropriate season)			
Vegetation Stabilization Planting[5] (Summer)	SS-2, SS-4	☒	This report is prepared for Preliminary Phase. Therefore, design plan sheets have not been prepared at this time.
Hydraulic Stabilization Hydroseeding[2] (Summer)	SS-4	☐	
Bonded Fiber Matrix or Stabilized Fiber Matrix[6] (Winter)	SS-3	☐	
Physical Stabilization Erosion Control Blanket[3] (Winter)	SS-7	☒	
B. Select erosion control method for disturbed flat areas (slope < 5%) (choose at least one)			
County Standard Lot Perimeter Protection Detail	PDS 659[7], SC-2	☐	This report is prepared for Preliminary Phase. Therefore, design plan sheets have not been prepared at this time.
Will use erosion control measures from Item A on flat areas also	SS-3, 4, 7	☒	
County Standard Desilting Basin (must treat all site runoff)	PDS 660[8], SC-2	☒	
Mulch, straw, wood chips, soil application	SS-6, SS-8	☐	

4 State of California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual. March. Available online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm.

5 If Vegetation Stabilization (Planting or Hydroseeding) is proposed for erosion control it may be installed between May 1st and August 15th. Slope irrigation is in place and needs to be operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. The owner must implement a contingency physical BMP by August 15th if vegetation establishment does not occur by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.

6 All slopes over three feet must have established vegetative cover prior to final permit approval.

7 County of San Diego, Planning & Development Services. 2012. Standard Lot Perimeter Protection Design System. Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds659.pdf.

8 County of San Diego, Planning & Development Services. 2012. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds660.pdf.

Table 1. Construction Storm Water BMP Checklist (continued)

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook Detail or County Std. Detail	a BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
C. If runoff or dewatering operation is concentrated, velocity must be controlled using an energy dissipater			
Energy Dissipater Outlet Protection[9]	SS-10	☒	This report is prepared for Preliminary Phase. Therefore, design plan sheets for construction phase BMPS have not been prepared at this time.
D. Select sediment control method for all disturbed areas (choose at least one)			
Silt Fence	SC-1	☒	This report is prepared for Preliminary Phase. Therefore, design plan sheets for construction phase BMPS have not been prepared at this time.
Fiber Rolls (Straw Wattles)	SC-5	☒	
Gravel & Sand Bags	SC-6 & 8	☒	
Dewatering Filtration	NS-2	☐	
Storm Drain Inlet Protection	SC-10	☒	
Engineered Desilting Basin (sized for 10-year flow)	SC-2	☒	
E. Select method for preventing offsite tracking of sediment (choose at least one)			
Stabilized Construction Entrance	TC-1	☒	This report is prepared for Preliminary Phase. Therefore, design plan sheets for construction phase BMPS have not been prepared at this time.
Construction Road Stabilization	TC-2	☐	
Entrance/Exit Tire Wash	TC-3	☒	
Entrance/Exit Inspection & Cleaning Facility	TC-1	☐	
Street Sweeping and Vacuuming	SC-7	☒	
F. Select the general site management BMPs			
F.1 Materials Management			
Material Delivery & Storage	WM-1	☒	This report is prepared for Preliminary Phase. Therefore, design plan sheets for construction phase BMPS have not been prepared at this time.
Spill Prevention and Control	WM-4	☒	
F.2 Waste Management[10]			
Waste Management Concrete Waste Management	WM-8	☒	This report is prepared for Preliminary Phase. Therefore, design plan sheets for construction phase BMPS have not been prepared at this time.
Solid Waste Management	WM-5	☒	
Sanitary Waste Management	WM-9	☒	
Hazardous Waste Management	WM-6	☒	

[9] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater is also acceptable for velocity reduction.

[10] Not all projects will have every waste identified. The applicant is responsible for identifying wastes that will be onsite and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 must be selected.

Note: The Construction General Permit (Order No. 2009-0009-DWQ) also requires all projects not subject to the BMP Design Manual to comply with runoff reduction requirements through the implementation of post-construction BMPs as described in Section XIII of the order.

Step 3: County of San Diego PDP SWQMP Site Information Checklist

Step 3.1: Description of Existing Site Condition

Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Otay Hydrologic Unit, Dulzura Hydrologic Area, Proctor HSA (910.32) and Jamul HAS (910.33)

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:
The site is vacant, undeveloped, natural land with the exception of Proctor Valley Road and a few other minor unpaved roads.

Existing Land Cover Includes (select all that apply and provide each area on site):

☒ Vegetative Cover 1,276.56 Acres (_____ Square Feet)
☐ Non-Vegetated Pervious Areas _____ Acres (_____ Square Feet)
☒ Impervious Areas 6.94 Acres (_____ Square Feet)

Description / Additional Information:
The total project area is 1,283.5 which includes 723.6 acres of Otay Ranch Proctor Valley 14 and 559.8 acres from Planning Areas 16 and 19 which will predominantly consist of Preserve Area.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

☐ NRCS Type A
☐ NRCS Type B
☒ NRCS Type C
☒ NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A if no infiltration is used): N/A

☐ 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
☐ Other

Description / Additional Information:
The existing site drains via natural watercourses throughout the site which ultimately confluence at Proctor Valley. Small wetland areas are also present along Proctor Valley. Portions of Planning Area 19 drain towards natural watercourse consisting of Jamul Creek.

Step 3.2: Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

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

Describe existing site drainage patterns:
Runoff from the Proposed Project site currently flows to Proctor Valley which acts as a natural drainage way directing flows in a southwesterly direction towards the Upper Otay Reservoir. Proctor Valley Road runs parallel to this natural drainage way and currently has minimal, if any, drainage facilities. Runoff from the undisturbed canyons east of Proctor Valley sheet flow over Proctor Valley Road en route to Proctor Valley. In some instances, runoff is conveyed within a storm drain culvert crossing underneath Proctor Valley Road. The eastern portion of Planning Area 19 includes a ridge which directs runoff naturally west towards Proctor Valley or east towards Jamul Creek.

The project area is vast. An existing condition hydrologic analysis was prepared for the site and included within the Drainage Study for Proctor Valley Village 14 and Preserve. The unit hydrograph analysis determined a peak 100-year flow of 12,036 cfs at the discharge point into the Upper Otay Reservoir. The tributary area at this discharge point is approximately 10.751 square miles and includes portions of the City of Jamul.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:

OVERVIEW & BACKGROUND

The Proposed Project (defined below) is part of the overall Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas. The Proposed Project addressed by this technical report is located within a portion of Otay Ranch Village 14 and Planning Areas 16/19 in the Proctor Valley area of Otay Ranch as shown on Figure 1. The underlying purpose of the Proposed Project is to implement the adopted Otay Ranch General Development Plan/Subregional Plan, Volume II (County of San Diego 1993), ("Otay Ranch GDP/SRP") and complete the planned development within Jackson Pendo Development Company's ("Applicant") ownership of Village 14 and Planning Areas 16/19. The Otay Ranch GDP/SRP is a component part of the County General Plan (County of San Diego 2011) and allows for a total of 2,123 homes in Otay Ranch Village 14 and Planning Areas 16/19. The Proposed Project's 1,119 homes represent a portion of the total 2,123 homes originally authorized in the Otay Ranch GDP/SRP. The Proposed Project is designed to be consistent with the Otay Ranch GDP/SRP's Village Character Policy "to serve as a transitional area between urban densities to the west and Jamul to the east". The Proposed Project is therefore designed to provide a transitional village between the densities and character of eastern Chula Vista and the more rural community of Jamul. The Proposed Project proposes 1,119 homes of which 9941 are in Village 14 and 125 homes in Planning Areas 16/19 as shown in Table 1 Site Utilization Plan Summary.

PROPOSED SPECIFIC PLAN: Summary The adopted Otay Ranch GDP/SRP requires the preparation of a Specific Plan, which includes a Site Utilization Plan to describe the land uses for the Proposed Project. Figures 2 and 3 depict the proposed Site Utilization Plan. Tables 1-5 quantify the proposed land uses.

Approximately 994 homes are planned in Village 14, set in three distinct areas (referred to herein as the South, Central and North Village 14). 878 of these homes will be single-family homes located in gated enclaves and 116 will be detached courtyard homes. Twelve neighborhoods are planned with approximate densities ranging from 0.2 to 10.0 dwelling units per acre. Otay Ranch Village 14 is planned around a "Village Core", centrally located in the heart of the village. The Village Core is comprised of a 9.7-acre elementary school; a 7.2-acre Village Green (public park); a 1.7-acre Mixed Use Site with up to 10,000 square feet of commercial/retail uses; and a 2.3-acre public safety site for a fire station and satellite sheriff's facility. Additional public and private parks, swim clubs, trails and recreational facilities will be situated throughout South, Central and North Village 14. See Table 2 for detailed land uses in Village 14. In addition to the homes in Village 14, there are 13 one-acre average sized estate lots proposed in Planning Area 19 and 112 three-acre average sized ranchettes proposed in Planning Area 16. Planning Area 16/19 neighborhoods will not be gated. The Limited Development Area may include public infrastructure, and/or be conserved within private lots with a conservation easement. See Tables 3 and 4 for detailed land uses in Planning Area 16/19. The Proposed Project's Specific Plan is designed around an active lifestyle and wellness recreation theme and includes a park and recreation system including four public parks totaling approximately 15.2 acres. The remaining private recreation facilities include three private swim clubs, and numerous pocket parks totaling approximately 9.5 acres. An approximately 4.5 mile, 10-foot wide decomposed granite Community Pathway is proposed along Proctor Valley Road from Chula Vista to Jamul. The Proposed Project includes approximately 27.6 acres of open space, (exclusive of the 110.1 acres of open space included in the residential gross acres),127.1 acres of LDA and 426.7 acres of Otay Ranch RMP Preserve within the Applicant's ownership. Of note, there is approximately 72.4 acres of Conserved Open Space within the Proposed Project that will be conserved by recording a biological open space easement.

Circulation and Access: Regional access to Otay Ranch Village 14 is provided by State Route 125 (SR-125), located approximately three miles to the west. Interstate 805 (I-805), approximately eight miles to the west, provides secondary north/south access. State Route 54 (SR-54), located approximately six miles to the northwest, connects to SR-125 and I-805, and provides regional east/west access. SR-94, located approximately 3 miles to the northeast, provides access from the east through the Jamul community. Proctor Valley Road would provide the main access to the Proposed Project. Four roundabouts in Village 14 and one roundabout in Planning Area 16/19 would identify the entrance into each residential area as well as provide traffic calming at key internal intersections. The internal circulation plan also includes a series of collectors and residential streets to provide access to the residential neighborhoods; with Planning Areas 16/19 designed to County Rural Road Standards. A secondary access to the easternmost portion of Planning Area 16 is the planned extension of existing Whispering Meadows Lane. Proctor Valley Road is planned as a two-lane mobility element road and is designated as a scenic corridor. The northern connection of Otay Ranch Village 14 to the community of Jamul will remain substantially in the alignment of the existing partially-improved Proctor Valley Road and will be paved to provide both public access and secondary emergency access for the Proposed Project as well as for the community of Jamul.

Public Services A recap of public services is provided as follows:

Sewer: Capacity will be provided by the County through annexation into the County Sanitation District. Sewer transportation will be provided by conveying flows to the Salt Creek Interceptor located in the City of Chula Vista pursuant to agreements between the City and County. Sewer will be provided in Village 14 and Planning Areas 16/19 per the Otay Ranch GDP/ SRP and adopted sewer agreements. The Proposed Project includes sewer trunk line extensions and pump, or lift, stations.

Water: The Proposed Project is located within the Otay Water District boundary and is already accommodated in the Otay Water District Water Resources Master Plan. A 980-pressure zone water tank adjacent to Central Village 14 is planned onsite. The Proposed Project includes water transmission lines, a 980 reservoir and pump stations.

Law Enforcement: County Sheriff's office will provide law enforcement services and will have a storefront facility co-located with the Fire Station at the public safety site in the Village Core.

Fire: Fire service will be provided by the San Diego County Fire Authority ("SDCFA") from a fire station built within the Proposed Project's public safety site in the Village Core.

Stormwater/Drainage: Biofiltration basins are planned.

Schools: Village 14 is planned to be served by the Chula Vista Elementary School District and Sweetwater Union High School District. Planning Areas 16/19 are planned to be served by the Jamul-Dulzura Union School District and the Grossmont High School District as prescribed in the adopted Otay Ranch GDP/SRP Facilities Implementation Plan and consistent with County Board of Supervisors Policy I-109, Policy II.

Options

The Proposed Project includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option and (3) the Perimeter Trail Option. The Draft EIR assesses each of these options and their respective impacts. This will allow the County to select the option (or combination of options) it considers best for the Proposed Project and the environment. Each of the options summarized below. For detailed descriptions with exhibits, see the Specific Plan Section VIII. Internal Circulation Options.

Proctor Valley Road North Option: The Proctor Valley Road North Option applies to the portion of Proctor Valley Road from Street AA in the North Village to Echo Valley Road, and includes two dedicated bike lanes (one on each side of the road) instead of the "sharrows"[1] proposed in street section 10 of the Proposed Project. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 64 feet starting from the intersection of Street AA northward to the Applicant's Village 14 ownership boundary; from 40 feet to 48 feet within the offsite improvement area owned by the State; and from 40 feet to 64 feet onsite within the Applicant's ownership north of the State's property to Echo Valley Road.

Preserve Trails Option: The Preserve Trails Option consists of two segments of existing, disturbed trails approximately 1.0-mile in length within the Project Area, east of the Development Footprint. These segments would be located within the Otay Ranch RMP Preserve. The Preserve Trails Option includes segments "A" & "B" as identified in the Otay Ranch GDP/SRP, which are also identified as segments 52 & 49 in the County of San Diego's Community Trails Master Plan (CTMP). Segment "A"/"52" is 2,350 lineal feet, located at the northern terminus of the Proctor Valley Community Pathway and extending east through the onsite Otay Ranch RMP Preserve to the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment "B"/"49" is 2,328 lineal feet and is located between South and Central Village 14, along an existing, historic ranch road. This trail is located within onsite Otay Ranch RMP Preserve and bisects regional wildlife corridor R1. The Preserve Trails Option would retain these portions of trails in their existing conditions, which meet the CTMP primitive trail standard. No improvements to these Preserve Trails are contemplated.

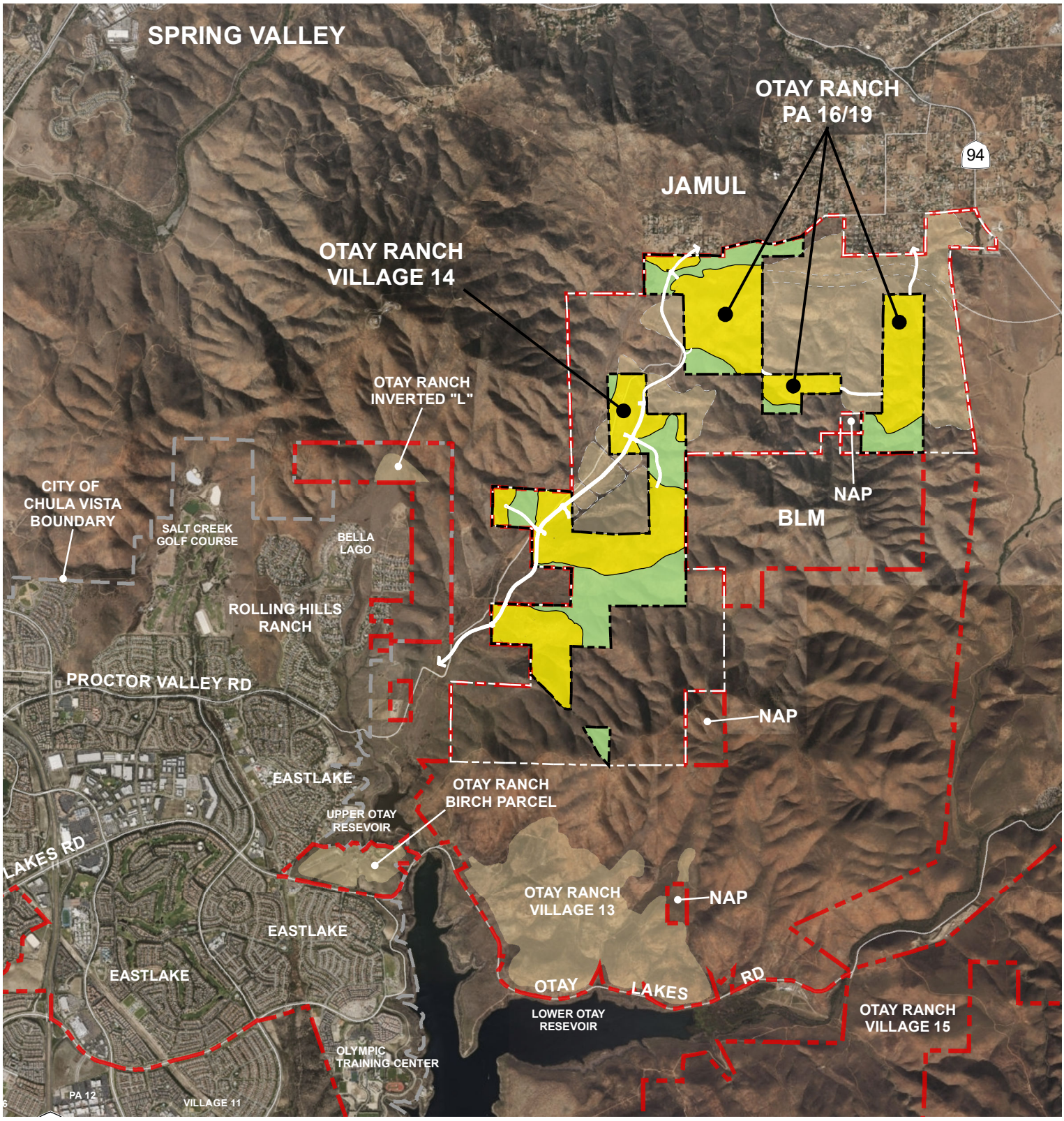
Perimeter Trail Option: The Perimeter Trail Option is an approximately 3.6- mile perimeter trail located within the Development Footprint of South and Central Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive trail standards, and the trail tread varies from 2-6 feet. Due to topography, trail grades range from 2% to the maximum grade allowed of 30%. The Perimeter Trail Option requires the construction of approximately 3,545 lineal feet (0.7 miles) of 5 to-7-foot-high retaining walls due to steep topography and drainage constraints. The Perimeter Trail Option would be graded as part of overall project grading and does not encroach into the Otay Ranch RMP Preserve. The perimeter trail would be accessed at public parks and trailheads and would be maintained by the County of San Diego.

Hunsaker & Associates San Diego, Inc. has evaluated these options and they are not material to the information presented in this technical report.

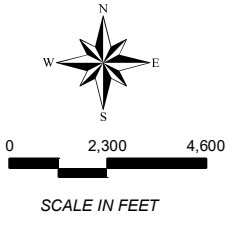
[1] Sharrows are road markings that guide bicyclists to bike routes between neighborhoods and alert motorists to the presence of bicyclists within the shared travel lane.

NOT TO SCALE

Figure 1
Regional Location Map



SOURCE: LUEG-GIS 2014 AERIAL IMAGERY



LEGEND

- OTAY RANCH GDP/SRP BOUNDARY
- PROPOSED SPECIFIC PLAN BOUNDARY
- OTAY V14 & PA16/19 VILLAGE BOUNDARY
- MUNICIPAL BOUNDARY
- V14 & PA16/19 DEVELOPMENT AREAS
- V14 & PA16/19 MSCP OPEN SPACE
- OTHER APPROVED DEVELOPMENT

Figure 2
Otay Ranch Village 14 and Planning Area 16/19 and Surrounding Land Uses

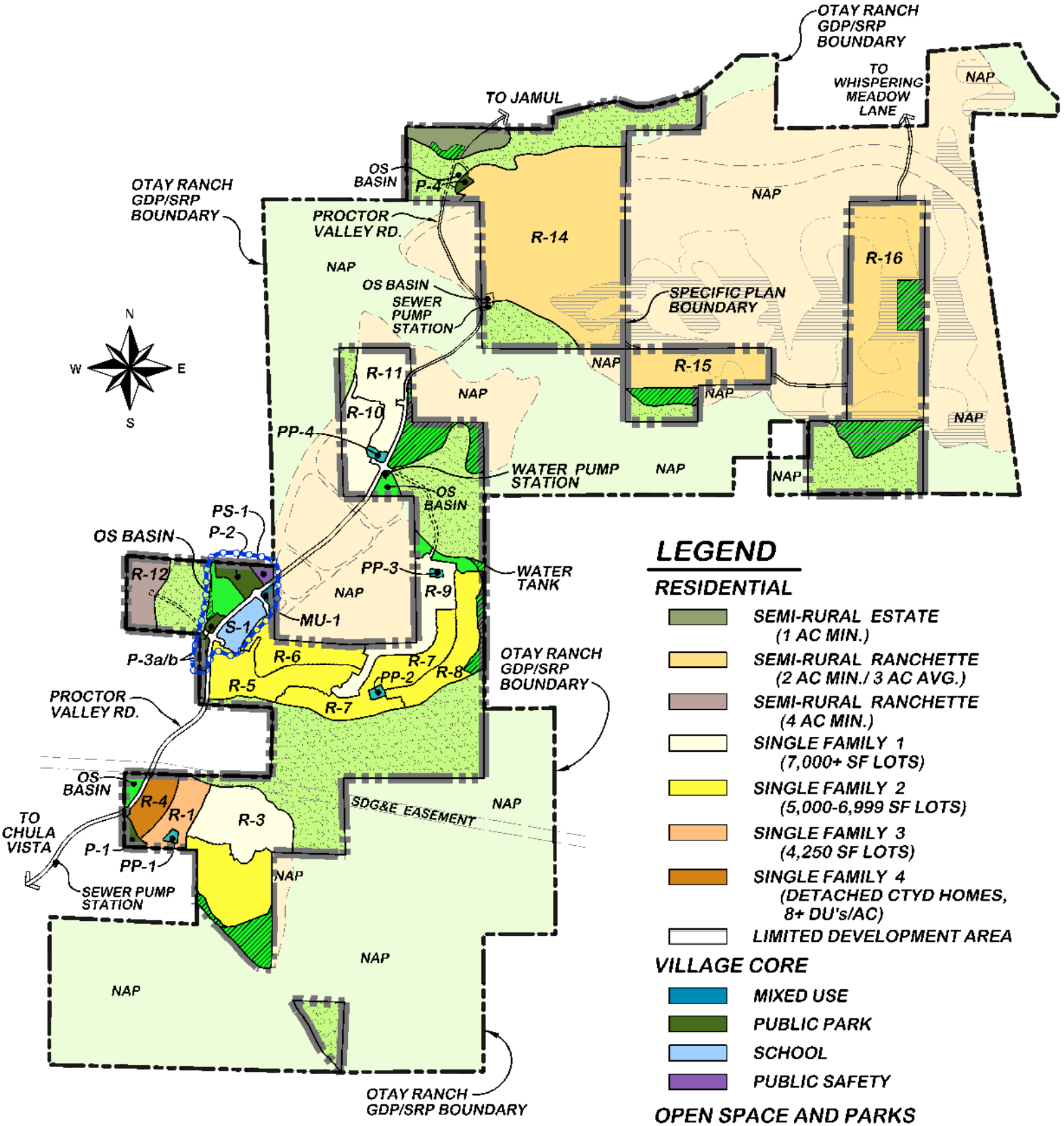


Figure 3

08-21-17 **Otay Ranch Village 14 and Planning Area 16/19 Site Utilization Plan**

Table 1
Village 14 and Planning Areas 16/19
Site Utilization Plan Summary
January 9, 2018

Description	Village 14		Planning Area 16/19		Total Proposed Project	
	Gross Acres *(1,2)*	Target Units *(3)*	Gross Acres *(4,5)*	Target Units	Gross Acres	Target Units
Residential Subtotal	344.2	897.0	363.6	125	707.7	1,022
Residential Use on School Site (9.7 acres) *(3)*		97				97
Non-Residential Uses						
Mixed Use *(6)*	1.7				1.7	
Public Parks	13.8		1.4		15.2	
Private Parks/Recreation *(2)*	4.5				4.5	
Public Safety Site	2.3				2.3	
Elementary School Site *(3)*	9.7				9.7	
Open Space	27.6		2.1		29.7	
Conserved Open Space	36.9		35.5		72.4	
Otay Ranch RMP Preserve	270.2		156.5		426.7	
Circulation	12.7		0.8		13.6	
Non-Residential Uses Subtotal	379.5	-	196.3		575.8	-
Total Proposed Project	**723.7**	**994**	**559.8**	**125**	**1283.5**	**1,119**

Notes

(1) Residential gross acres in Village 14 includes 96.0 acres of related internal slopes, fuel modification and/or preserve edge.

(2) Village 14 has 5.0 acres of private pocket parks included in the residential acreage; therefore the subtotal including PPP is 9.5 acres.

(3) Units allocated to school site at 10 DU/ac per the Otay Ranch GDP/SRP policies. Should school site not be needed, 97 units may be built. Should the school site be needed, the Total Target Units is 897 in Village 14 and 1,022 total.

(4) Residential gross acres in Planning Area 16/19 includes 14.1 acres of related private lift and pump stations.

(5) Residential gross acres in Planning Area 16/19 includes 127.1 acres of limited development area (LDA). See Table 4 for details.

(6) Village 14 Mixed Use acreage includes 10,000 sf of commercial use.

(7) 85.4 acres of offsite impacts are in excluded from the acreage above. See Table 5 for details.

Table 2
Village 14
Site Utilization Plan Detail
January 9, 2018

Description		Gross Acres (1,2)	Target Units	Density
Single Family Residential				
R-1	50*85	18.0	81	4.5
R-2	60*100	38.5	82	2.1
R-3	71*100	41.1	73	1.8
R-4	Courtyard	13.8	116	8.4
R-5	50*100	35.0	103	2.9
R-6	60*100	25.7	71	2.8
R-7	60*85	40.7	108	2.7
R-8	60*100	28.7	75	2.6
R-9	75*100	30.0	74	2.5
R-10	70*85	25.1	49	1.9
R-11	80*100	28.6	61	2.1
R-12	4 ac min	18.9	4	0.2
Single Family Residential Subtotal		**344.2**	**897**	**2.6**
Residential Use on School Site (9.7 acres) *(3)*			97	
Non-Residential Uses				
Mixed Use *(4)*	MU - C	1.7		
Public Parks				
P-1	South Park	2.9		
P-2	Village Green Park	7.2		
P-3	Scenic Park	3.7		
Public Parks Subtotal		13.8		
Private Parks & Recreation				
PP-1	South	1.0		
PP-2	Central	1.2		
PP-3	Private Park	0.7		
PP-4	North	1.5		
PPP *(4)*	Various	0.0		
Private Parks/Recreation Subtotal		4.5		
Public Safety Site		2.3		
Elementary School Site *(3)*		9.7		
Open Space		27.6		
Conserved Open Space		36.9		
Otay Ranch RMP Preserve		270.2		
Circulation - Arterial		12.7		
Non-Residential Uses Subtotal		**379.5**		
Village 14 Subtotal		**723.7**	**994**	**1.4**

Notes

(1) Residential gross acres includes 96.0 acres of related internal slopes, fuel modification and/or preserve edge open space lots.

(2) Village 14 has 5.0 acres of private pocket parks included in the residential acreage; therefore the subtotal including PPP is 9.5 acres.

(3) Units allocated to school site at 10 DU/ac per the Otay Ranch GDP/SRP policies. Should school site not be needed, 97 units may be built. Should the school site be needed, the Total Target Units is 897.

(4) Village 14 Mixed Use acreage includes 10,000 sf of commercial use.

(5) Off-site impacts are in excluded from the acreage above. See Table 5 for details.

Table 3
Planning Areas 16/19
Site Utilization Plan Detail
January 9, 2018

Description		Gross Acres (1,2)	Target Units	Density
Residential Uses				
R-13	Estates 1 acre avg	13.4	13	1.0
R-14	Ranchettes 2 acre min	192.0	71	0.4
R-15	Ranchettes 2 acre min	41.9	11	0.3
R-16	Ranchettes 2 acre min	116.3	30	0.3
Residential Subtotal		**363.55**	**125**	**0.3**
Non-Residential Uses				
Public Park P-4	Northern Park	1.4		
Open Space		2.1		
Conserved Open Space		35.5		
Otay Ranch RMP Preserve		156.5		
Circulation Arterial		0.8		
Non-Residential Uses Subtotal		**196.3**		
Planning Area 16/19 Subtotal		**559.8**	**125.0**	**0.2**

Notes

(1) Gross acres includes 127.1 acres of limited development area (LDA). See Table 4 for details.

(2) Residential gross acres includes 14.1 acres of related private lift and pump stations open space lots.

(3) Off-site impacts are in excluded from the acreage above. See Table 5 for details.

Table 4
Planning Areas 16/19
Limited Development Area (LDA) Detail
January 9, 2018

Description		Component Acres LDA	Component Acres Other	Acres Total
Residential Uses				
R-13	Estates 1 acre avg	0.0	13.4	13.4
R-14	Ranchettes 3 acre avg	17.3	174.7	192.0
R-15	Ranchettes 3 acre avg	27.1	14.8	41.9
R-16	Ranchettes 3 acre avg	50.9	65.4	116.3
Residential Subtotal *(5)*		**95.3**	**268.3**	**363.6**
Non-Residential Uses				
Public Park P	Northern Park		1.4	1.4
Open Space			2.1	2.1
Conserved Open Space		31.9	3.6	35.5
MSCP Preserve			156.5	156.5
Circulation Arterial			0.8	0.8
Non-Residential Uses Subtotal		**31.9**	**164.4**	**196.3**
Planning Area 16/19 Subtotal		**127.1**	**432.7**	**559.8**

Table 5
Village 14 and Planning Areas 16/19
Off-Site Infrastructure (Temporary + Permanent)
January 9, 2018

Off-site *(1)*	Location	Acres		
		ROW	Temporary	Total
Proctor Valley Road - MSCP Planned Facility *(2)*				
South	City of Chula Vista	2.3	2.8	5.1
South	City of San Diego	10.1	17.6	27.7
Central	City of San Diego	2.8	4.3	7.1
Central	State	4.1	8.6	12.7
North	State	3.6	13.2	16.8
North	County of SD Easement	0.1	0.2	0.3
PA 16 Access Roads - MSCP Allowed Facility *(2)*				
R-14 to R-15	State	0.3	1.0	1.3
R-15 to R-16	State	1.6	7.2	8.8
R-16 to Whispering Meadows	State	1.5	4.2	5.7
Sewer Trunk Line to Salt Creek Interceptor *(3)*	City of Chula Vista	--	--	--
Total		**26.4**	**59.0**	**85.4**

Notes

(1) Off-sites include all road improvements, sewer, water, drainage and related utilities.

(2) See section 1.9.3 of the MSCP for planned and allowed facilities.

(3) In existing improved Proctor Valley Road to approximate tie in at Hunte Parkway

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
The proposed imperviousness which will be added to the site will include streets, sidewalks, driveways, pavement, roofs, patios, parking, and athletic courts.

List/describe proposed pervious features of the project (e.g., landscape areas):
The site will include pervious surfaces such as landscaped areas, vegetated swales, biofiltration areas, permeable pavement, and areas which will remain in their natural condition.

Does the project include grading and changes to site topography?

☒Yes

☐No

Description / Additional Information:
The overall site drainage towards the Upper Otay Reservoir will remain without diversion. However, drainage patterns within the internal subwatersheds will occur. These changes will be mitigated by the proposed storm drain system consisting of inlets, pipes, cleanouts, energy dissipation, and basins.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation	1,276.56	1,058.35	-17.0%
Pervious (non-vegetated)			0
Impervious	6.94	225.65	+17.0%

Step 3.4: Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒Yes

☐No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

In the developed condition, the Project Area will drain in the same general direction as existing towards the Upper Otay Reservoir. Developed site topographies range from approximately 595 feet AMSL to 1265 feet AMSL which includes the site of the future water tank located within the northeast portion of the Proposed Project. The higher elevation portions west of the eastern watershed ridge line are not proposed for development. All runoff from the proposed project will discharge to Proctor Valley. Development from the site will not cause any diversion to or from the Upper Otay Reservoir watershed. Onsite developed areas will be conveyed towards water quality and HMP treatment facilities prior to discharging into Proctor Valley. Where feasible and possible, a separate storm drain system will route offsite runoff flow through the site and directly discharge into Proctor Valley rather than comingling with onsite flows which require water quality treatment of the 85th percentile runoff volume. In some instances, natural drainage flows which are being routed around the site will reach the proposed improvements relative to Proctor Valley Road. In those cases, a storm drain or culvert will be constructed under the roadway to convey flows.

As the case with the existing condition analysis, a proposed condition unit hydrograph hydrologic analysis was performed due to the vast tributary area of the site and affected areas tributary to the Upper Otay Reservoir (discharge location). The analysis did not include any onsite detention as the City of San Diego does not favor flow reductions to the Upper Otay Reservoir. The analysis determined that the peak flow increased from 12,036 cfs to 12,736 cfs. Please refer to the Drainage Study for Otay Ranch Village 14 & Planning Areas 16/19 for associated drainage calculations relative to the proposed development. Below is a summary table of flows. The area decrease is attributed to the minor area diversion towards Jamul Creek.

Condition	Tributary Area (acres)	100-Year Peak Flow (cfs)
Pre-Developed	6,880.65	12,036
Post-Developed	6,880.24	12,736
DIFFERENCE	**-0.41**	**+700**

Step 3.5: Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply). Select "Other" if the project is a phased development and provide a description:

- ☒ 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
- ☐ Other (provide description)

Description / Additional Information:
Along with residential units, multi-use facilities and schools are planned to be constructed within Village 14. Therefore, some of the items listed above are reflective of those facilities such as interior floor drains and elevator shaft sump pumps, storage of equipment, loading docks, and fire sprinkler test water.

Step 3.6: 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 Village 14 project site is located immediately adjacent to Proctor Valley which directly discharges into the Upper Otay Reservoir. The eastern portion of Planning Area 19 drains towards Jamul Creek. The onsite storm drain which conveys developed flows will be routed through a biofiltration basin prior to discharging into Proctor Valley and Jamul Creek. Overflow from the Upper Otay Reservoir empties into the Lower Otay Lake (reservoir) whose discharge is monitored by the Savage Dam. Any discharge from the Savage Dam will flow west through the Otay River and ultimately empty into San Diego Bay.

List any 303(d) impaired water bodies[11] 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
Lower Otay Reservoir	*Ammonia, Color, Iron, Manganese, Nitrogen, Phosphorous*	*Nitrogen*
San Diego Bay	*PCBs*	*Bacteria, Dissolved Copper, Lead, Zinc (wet Weather)*

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see 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	☐	☐	☐

[11] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

Step 3.7: Hydromodification Management Requirements

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

☒Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.

☐No, the project will discharge runoff directly to 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[12] for the watershed in which the project resides.

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

[12] The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is available online at the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Step 3.7.1: Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Projects must satisfy critical coarse sediment yield area (CCSYA) requirements by characterizing the project as one of the scenario-types presented below and satisfying associated criteria. Projects must appropriately satisfy all requirements for identification, avoidance, and bypass, OR may alternatively elect to demonstrate no net impact.

☐ **Scenario 1**: Project is subject to and in compliance with RPO requirements *(without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3) that result in impacts to more than 15% of the project-scale CCSYAs)*.

- ☐ Identify: Project has identified both onsite and upstream CCSYAs as areas that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project has avoided onsite CCSYAs per existing RPO steep slope encroachment criteria. AND,
- ☐ Bypass: Project has demonstrated that both onsite and upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 1 criteria above and must alternatively demonstrate no net impact to the receiving water.

☒ **Scenario 2**: Project is entirely exempt/not subject to RPO requirements without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3).

- ☒ Identify: Project has identified upstream CCSYAs that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☒ Avoid: Project is not required to avoid onsite CCSYAs as none were identified in the previous step. AND,
- ☒ Bypass: Project has demonstrated that upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 2 criteria above and must alternatively demonstrate no net impact to the receiving water. *(Skip to next row).*

☐ **Scenario 3**: Project utilizes exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3) and impacts more than 15% of the project-scale CCSYAs.

- ☐ No Net Impact: Project is not eligible for traditional methods of identification, avoidance, and bypass. Project must demonstrate no net impact to the receiving water.

Critical Coarse Sediment Yield Areas Continued
Demonstrate No Net Impact
If the project elects to satisfy CCSYA criteria through demonstration of no net impact to the receiving water. Applicants must identify the methods utilized from the list below and provide supporting documentation in Attachment 2c of the SWQMP. Check all that are applicable. ☒ N/A, the project appropriately identifies, avoids, and bypasses CCSYAs. ☐ Project has performed additional analysis to demonstrate that impacts to CCSYAs satisfy the no net impact standard of Ep/Sp≤1.1. ☐ Project has provided alternate mapping of CCSYAs. ☐ Project has implemented additional onsite hydromodification flow control measures. ☐ Project has implemented an offsite stream rehabilitation project to offset impacts. ☐ Project has implemented other applicant-proposed mitigation measures.

Step 3.7.2: 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 Otay Ranch Village 14 & Planning Areas 16/19 project was subdivided into twelve Points of Compliance. A total of fourteen basins will serve the POCs for flow control. A brief description of each POC is described below. Please refer to Attachment 2a for the complete POC description and HMP design study relative to the twelve POCs. POC1: POC1 is located within Village 14 along the side of Proctor Valley Road. POC1 is at the storm drain discharge point into Proctor Valley. Basin 1 and Basin 13 treat runoff within this POC drainage area POC2: POC2 is located within the southern portion of Village 14. POC2 is at the storm drain discharge point into Proctor Valley at the east side of Proctor Valley Road. Basin 2 treats runoff within this POC drainage area POC3: POC3 is located along the west side of Proctor Valley Road. A roadside biofiltration area (Basin #3) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. The proposed sewer pump station is also included within this developed subwatershed to POC3. POC4: POC4 is located along the east side of Proctor Valley Road. A roadside biofiltration area (Basin #4) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. POC5: POC5 is located along the east side of Proctor Valley Road. A roadside biofiltration area (Basin #5) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. POC 6-8, 13: POCs 6-8 and 13 are located within the Planning Area 19 portion of the project. These POCs are at storm drain discharge points from biofiltration Basins 6-8 and 14 which treat runoff from estate development. These outlets discharge into tributaries of either Proctor Valley or Jamul Creek. POC 9-14: POCs 9-14 are located within the Planning Area 16 and 19 portions of the project. These POCs are at storm drain discharge points from biofiltration Basins 9-13 which treat runoff from estate development. These outlets discharge into Proctor Valley or its tributary.

Has a geomorphic assessment been performed for the receiving channel(s)?
☒ No, the low flow threshold is 0.1Q2 (default low flow threshold)
☐ Yes, the result is the low flow threshold is 0.1Q2
☐ Yes, the result is the low flow threshold is 0.3Q2
☐ Yes, the result is the low flow threshold is 0.5Q2

If a geomorphic assessment has been performed, provide title, date, and preparer:

Discussion / Additional Information: (optional)

Step 3.8: 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.

Large offsite areas which will not be developed will drain towards developed areas. In order to minimize the size of the proposed water quality basins, these large offsite areas will be separately conveyed through the development so that they do not comingle with the onsite developed runoff which likely contain pollutants.

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.

Step 4: Source Control BMP Checklist

Source Control BMPs			
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the County BMP Design Manual for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following: · "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. · "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. · "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.4 not implemented:			

Source Control Requirement	Applied?		
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.5 not implemented:			
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☒ A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☒ B. Interior floor drains and elevator shaft sump pumps	☒Yes	☐No	☐N/A
☒ C. Interior parking garages	☒Yes	☐No	☐N/A
☒ D. Need for future indoor & structural pest control	☒Yes	☐No	☐N/A
☒ E. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☒ F. Pools, spas, ponds, fountains, and other water features	☒Yes	☐No	☐N/A
☒ G. Food service	☒Yes	☐No	☐N/A
☒ H. Refuse areas	☒Yes	☐No	☐N/A
☐ I. Industrial processes	☐Yes	☐No	☒N/A
☒ J. Outdoor storage of equipment or materials	☒Yes	☐No	☐N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☒ M. Fuel dispensing areas	☐Yes	☐No	☒N/A
☒ N. Loading docks	☒Yes	☐No	☐N/A
☒ O. Fire sprinkler test water	☒Yes	☐No	☐N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	☒N/A
☒ Q. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above. Development of the site does not include industrial processes, interior parking structures, or vehicle cleaning or maintenance shops. Therefore, 'N/A' was selected in those instances.			

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

Step 5: Site Design BMP Checklist

Site Design BMPs
All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the County BMP Design Manual for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following: · "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. · "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. · "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.1 not implemented: Where feasible, existing natural drainage ways will be maintained.			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.2 not implemented:			
4.3.3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.5 not implemented: Rooftop downdrains will be directed towards adjacent landscaping whenever possible.			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.6 not implemented: Rain barrels are not considered to be feasible and are not planned at this project phase. However, rainwater harvesting may be implements later as part of a water conservation plan.			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvesting and Using Precipitation	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.8 not implemented: There is no demand for rainwater harvesting for the site. This site ultimately drains into Proctor Valley which in turn empties into the Upper Otay Reservoir. As discussed within the Drainage Study for Otay Ranch Village 14 and Planning Areas 16/19 (September 2017), flow reductions to this reservoir are not encouraged as the reservoir and the downstream Lower Otay Reservoir have capacity for unattenuated flows from the development.			

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

*- Rainwater harvesting may be implemented as part of a water conservation plan. If implemented, this plan will supplement the proposed site design BMPs. Sizing of the BMPs for this study are conservative and do not apply DCV credit for any rainwater harvesting.

Step 6: PDP Structural BMPs

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

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

Use this section 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 (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Step 6.1: Description of structural BMP strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number.

This site will include fourteen regional-type biofiltration basins at the downstream portions of the developed areas and along Proctor Valley Road (PVR) and onsite roadways which will act to address both pollution control and flow control measures. In instances which basin are infeasible (along PVR), proprietary biofiltration devices (Modular Wetland Units) are proposed. The BMPs were selected based on their effectiveness for pollutant removal and ability to also be used for flow control.

In selection of the biofiltration BMPs, the following steps were taken as presented in Section 5.1 of the BMP Design Manual.

1. Identified the DMAs that are not self-retaining, self-mitigating, or De minimis.
2. Estimate DCV.
3. Determined that there was not a demand for rainwater harvesting within the development.
4. Determined the feasibility of each basin to infiltrate based on geotechnical engineer recommendations.
5. Computed sizing requirements using the County automated BMP-sizing worksheet.
6. Design BMP for DCV per design criteria and considerations listed in the fact sheets.

The fourteen onsite biofiltration basins have designated as BF-1-1 through BF-1-14. The prefix, BF-1, designates that the particular treatment facility is either a partial retention or biofiltration facility as defined within the County's BMP Design Manual. The developed areas which were infeasible to treat via basin facility will be treated by proprietary BMP. This occurs along PVR and tie-in streets. The prefix BF-3 designates that the particular treatment facility is proprietary biofiltration modular facility. A small area (0.10 acres) along Street 'QQ' will consist of permeable pavement as it was determined to be the best feasible option for this location.

As a pretreatment measure, proprietary flow-through treatment control BMPs are proposed immediately upstream of the two larger biofiltration facilities. They have been designated as FT-5-1 and FT-5-2 on the DMA exhibit in Attachment 1c.

The fourteen biofiltration treatment basins will also be sized to address flow control hydromodification for their respective local areas.

The following summarizes the proposed treatment Village 14 BMP facilities:

- **Three roadside biofiltration areas along Proctor Valley Road South**

Biofiltration areas are proposed as treatment measures for the southern portion of Proctor Valley Road which is south of the major developed areas. The vegetated biofiltration areas used for treatment control along roadsides will include an engineered fill layer for maximum pollutant removal. This 'biofiltration' subbase will provide a "High" pollutant removal efficiency for pollutants such as coarse sediment and trash and fine particles. Medium pollutant efficiency is attained for dissolved particles

(Continue on following page as necessary.)

(Continued from previous page)

- **Fourteen biofiltration water quality basins within developed portions of Village 14 and Planning Areas 16/19** are proposed to receive runoff from the majority of areas with proposed development. Each basin is designed to receive at least the 85th percentile storm. In some instances, basins will be designed to accept the peak flow and allow its respective riser to regulate the appropriate water quality treatment and flow control amounts. Each basin will have a riser as overflow protection with an open orifice located at the basin bottom. Drawdown times for each basin will be limited to a maximum of 96 hours.

Biofiltration basins provide "High" pollutant removal efficiency for all pollutants, except those that tend to be dissolved. This means that the proposed water quality basins have high pollutant removal efficiency for the primary pollutants of concern typically associated for this type of development. Biofiltration facilities provide a medium pollutant efficiency for pollutants that tend to be dissolved such as nutrients.

- According to the County of San Diego SUSMP, nutrients come mostly from fertilizers or from natural minerals that are dislodged from eroded soils. Additionally, nutrients can come from leaves, or dead plants. Nutrients from fertilizers and eroded soils are already dissolved and can only be reduced by preventing them from entering runoff. Nutrients from leaves or dead plants become dissolved once they are allowed to sit in water and degrade.

The proposed swales, roadside biofiltration areas, biofiltration water quality basins, proprietary BMPs, and street sweeping source control BMPs will prevent the larger sources of nutrients (such as leaves) from entering the Otay Reservoirs. Dissolved nutrients in the form of fertilizers will be reduced through the proposed source control BMPs encouraging homeowners and the homeowner's association to minimize their use. Furthermore, eroded soils will be minimized according to the hydromodification analysis provided at the end of this study.

- All 85th percentile calculations and BMP specifications are shown in Attachment D.
- All proposed BMPs for this project either meet or exceed the design recommendations set forth in the City of San Diego's "Source Water Protection Guidelines, SWPG".
- The Otay Water District (OWD) will supply the irrigation water for the proposed project. The main sources of water to the OWD are the Twin Oaks, Helix, and Skinner Reservoirs. According to the 2013 Consumer Confidence Report, total dissolved solids (TDS) from these three treatment plants were between 370 ppm and 410 ppm.

Surface runoff from the proposed project will enter the Upper Otay then subsequently the Lower Otay Reservoir, which is then treated by the Lower Otay Reservoir Treatment Plant and sent for distribution to the City of San Diego. According to the City of San Diego 2013 Annual Drinking Water Quality Report, the average TDS concentration from the Lower Otay Reservoir was 564 ppm. As previously mentioned, water quality results show that the highest TDS concentration in the OWD potable water that will be used to irrigate the proposed project is 410 ppm, which is lower than the average TDS concentration of 564 ppm at the Lower Otay Treatment Plant outfall. Overall, runoff from the proposed development contributes a small portion of the total Lower Otay Reservoir volume. It is expected that some additional TDS contribution will occur through human activity on the project site. In response to this, source control BMPs will be utilized to educate both homeowners and the homeowners association by discouraging fertilizers and car washing at home and encouraging the use of native plants for landscaping and the use of public car washing facilities. Furthermore, the development of this project will reduce the amount of natural open space, which will decrease the TDS that was occurring through natural erosion processes in the existing condition. In summary, the proposed development is not expected to cause adverse effects to the Upper Otay Reservoir due to the anticipated lower TDS concentration in the project irrigation water compared with the TDS at the reservoirs outfall, the use of source control BMPs, and the decrease in overall erosion potential due to reduced natural areas.

Project Phasing Note: Although this SWQMP covers the overall development of Village 14 and Planning Areas 16/19, the actual construction of the site will be done in phases. Regardless of proposed ultimate location and design of each treatment facility described in this SWQMP, each phase will be required to be in compliance with the then-current BMP Design Manual.

Step 6.2: Structural BMP Checklist

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

Structural BMP ID No. BF-1-1, through BF-1-14

Construction Plan Sheet No. TBD

Type of structural BMP:
☐ Retention by harvest and use (HU-1)
☐ Retention by infiltration basin (INF-1)
☐ Retention by bioretention (INF-2)
☐ Retention by permeable pavement (INF-3)
☒ Partial retention by biofiltration with partial retention (PR-1)
☒ Biofiltration (BF-1)
☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☐ Detention pond or vault for hydromodification management
☐ Other (describe in discussion section below)

Purpose:
☐ Pollutant control only
☐ Hydromodification control only
☒ Combined pollutant control and hydromodification control
☐ Pre-treatment/forebay for another structural BMP
☐ Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Jackson Pendo Development Company Contact: Elizabeth Jackson 2245 San Diego Ave. Ste 223 San Diego, CA 92110 (619) 267-4904
Who will be the final owner of this BMP?	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	Category 2

Discussion (as needed):

(Continue on subsequent pages as necessary)

Step 6.2: Structural BMP Checklist

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

Structural BMP ID No. FT-1 and FT-2

Construction Plan Sheet No. TBD

Type of structural BMP:
☐ Retention by harvest and use (HU-1)
☐ Retention by infiltration basin (INF-1)
☐ Retention by bioretention (INF-2)
☐ Retention by permeable pavement (INF-3)
☐ Partial retention by biofiltration with partial retention (PR-1)
☐ Biofiltration (BF-1)
☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☒ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☐ Detention pond or vault for hydromodification management
☐ Other (describe in discussion section below)

Purpose:
☐ Pollutant control only
☐ Hydromodification control only
☐ Combined pollutant control and hydromodification control
☒ Pre-treatment/forebay for another structural BMP
☐ Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Jackson Pendo Development Company Contact: Elizabeth Jackson 2245 San Diego Ave. Ste 223 San Diego, CA 92110 (619) 267-4904
Who will be the final owner of this BMP?	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	Category 2

Discussion (as needed):

(Continue on subsequent pages as necessary)

Step 6.2: Structural BMP Checklist

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

Structural BMP ID No. BF-3-1, BF-3-2, BF-3-3, BF-3-4, and BF-3-5 (dual units)

Construction Plan Sheet No. TBD

Type of structural BMP:
☐ Retention by harvest and use (HU-1)
☐ Retention by infiltration basin (INF-1)
☐ Retention by bioretention (INF-2)
☐ Retention by permeable pavement (INF-3)
☐ Partial retention by biofiltration with partial retention (PR-1)
☐ Biofiltration (BF-1)
☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
☒ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☐ Detention pond or vault for hydromodification management
☐ Other (describe in discussion section below)

Purpose:
☒ Pollutant control only
☐ Hydromodification control only
☐ Combined pollutant control and hydromodification control
☐ Pre-treatment/forebay for another structural BMP
☐ Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Jackson Pendo Development Company Contact: Elizabeth Jackson 2245 San Diego Ave. Ste 223 San Diego, CA 92110 (619) 267-4904
Who will be the final owner of this BMP?	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	Category 2

Discussion (as needed):

(Continue on subsequent pages as necessary)

Step 6.3: Offsite Alternative Compliance Participation Form

PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐ Yes ☐ No	Will your ACP project be completed prior to the completion of the PDP? ☐ Yes ☐ No
Does your ACP account for all Deficits generated by the PDP? ☐ Yes ☐ No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits)

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.3-1 (Required) -Worksheet B.1-1 (Required) -Worksheet B.4-1 (if applicable) -Worksheet B.4-2 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	☒ Included
Attachment 1b	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 1c	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒ Included
Attachment 1d	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☒ Included

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

The DMA Exhibit must identify:

☒ 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 Step 3.5)
☒ Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

ATTACHMENT 1a
STORM WATER POLLUTANT CONTROL
WORKSHEETS CALCULATIONS

Automated Worksheet B.3-1: Capture & Use Feasibility for Entire Project (V1.0)

Category	#	Description	Value	Units
Project Inputs	0	Design Capture Volume for Entire Project Site	447,792	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	3,941	#
	3	Total Planted Area within Development	25,500,000	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Usage Calculations	5	36-Hour Toilet Use Per Resident or Employee	0.37	cubic-feet
	6	Subtotal: Anticipated 36 Hour Toilet Use	1,474	cubic-feet
	7	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	8	Subtotal: Anticipated Landscape Use Over 36 Hours	30,522	cubic-feet
	9	Total Anticipated Use Over 36 Hours	31,996	cubic-feet
	10	Total Anticipated Use / Design Capture Volume	0.07	cubic-feet
Result	11	Are Capture and Use Techniques Feasible for this Project?	No	unitless

Worksheet B.3-1 General Notes:

A. Applicants may use this optional worksheet to gauge the feasibility of implementing capture and use techniques on their project site. User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

Otay Ranch Village 14 and Planning Areas 16/19 Population Estimates

11/7/2016

OPTION 1: USE THIS FOR IMPACTS ASSUMING SCHOOL SITE IS RESIDENTIAL

		Population	
Location	**SF Units**	**Per HH**	**Total Estimate**
Village 14*	994	3.6	3,578
Planning Areas 16/19	125	2.9	363
Total/Avg.	**1,119**	**3.5**	**3,941**

Source: SANDAG 2010 Census Datasurfer for 91914 (Village 14) and 92135 (PA 16/19

To be conservative,this technical report assumes the school site reflecting 97 residential units at 10DU/ac as it results in a higher impact than assuming the school site as an elementary school use.

VILLAGE 14 PLANNING AREAS 16/19
BIOFILTRATION BMP DMA CALCULATIONS

	Imp. RF	Pervious RF	% Imp	BASIN 1 BF-1-1	Imp Area	Pervious Area	Summation RF x A	BASIN 2 BF-1-2	Imp Area	Pervious Area	Summation RF x A	BASIN 3 BF-1-3	Imp Area	Pervious Area	Summation RF x A	BASIN 4 BF-1-4	Imp Area	Pervious Area	Summation RF x A	BASIN 5 BF-1-5	Imp Area	Pervious Area	Summation RF x A	BASIN 6 BF-1-6	Imp Area	Pervious Area	Summation RF x A
				(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)	
BASIN	0.90	0.10	0	4.34	0.00	4.34	0.43	2.09	0.00	2.09	0.21	0.21	0.00	0.21	0.02	0.18	0.00	0.18	0.02	0.12	0.00	0.12	0.01	0.08	0.00	0.08	0.01
MF	0.90	0.10	85	0.00	0.00	0.00	0.00	29.33	24.93	4.40	22.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (50% Imp)	0.90	0.10	50	140.76	70.38	70.38	70.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (60% imp)	0.90	0.10	60	0.00	0.00	0.00	0.00	53.92	32.35	21.57	31.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	14.54	1.45	13.09	2.62	6.89	0.69	6.20	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU-1/CF	0.90	0.10	85	3.21	2.73	0.48	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (80% imp)	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	3.86	0.97	3.57	0.06	0.05	0.01	0.05
ROAD (85%)	0.90	0.10	85	11.59	9.85	1.74	9.04	14.86	12.63	2.23	11.59	4.00	3.40	0.60	3.12	3.29	2.80	0.49	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCHOOL	0.90	0.10	85	0.00	0.00	0.00	0.00	9.80	8.33	1.47	7.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	18.79	0.00	18.79	1.88	32.70	0.00	32.70	3.27	0.42	0.00	0.42	0.04	0.00	0.00	0.00	0.00	1.69	0.00	1.69	0.17	1.67	0.00	1.67	0.17
ESTATE	0.90	0.10	25	0.00	0.00	0.00	0.00	11.64	2.91	8.73	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.55	2.39	7.17	2.87
				193.23	84.41	108.82	86.85	161.23	81.84	79.39	81.60	4.63	3.40	1.23	3.18	3.47	2.80	0.67	2.58	6.64	3.86	2.78	3.76	11.37	2.44	8.93	3.09
						Weighted C =	0.45			Weighted C =	0.51			Weighted C =	0.69			Weighted C =	0.74			Weighted C =	0.57			Weighted C =	0.27

VILLAGE 14 PLANNING AREAS 16/19
BIOFILTRATION BMP DMA CALCULATIONS

	Imp. RF	Pervious RF	% Imp	BASIN 7 BF-1-7	Imp Area	Pervious Area	Summation RF x A	BASIN 8 BF-1-8	Imp Area	Pervious Area	Summation RF x A	BASIN 9 BF-1-9	Imp Area	Pervious Area	Summation RF x A	BASIN 10 BF-1-10	Imp Area	Pervious Area	Summation RF x A	BASIN 11 BF-1-11	Imp Area	Pervious Area	Summation RF x A	BASIN 12 BF-1-12	Imp Area	Pervious Area	Summation RF x A
				(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)	
BASIN	0.90	0.10	0	0.09	0.00	0.09	0.01	0.10	0.00	0.10	0.01	1.37	0.00	1.37	0.14	0.15	0.00	0.15	0.02	0.21	0.00	0.21	0.02	0.77	0.00	0.77	0.08
MF	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (50% Imp)	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (60% imp)	0.90	0.10	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU-1/CF	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (80% imp)	0.90	0.10	80	0.00	0.00	0.00	0.00	1.54	1.23	0.31	1.14	6.53	5.22	1.31	4.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (100%)	0.90	0.10	100	0.77	0.77	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (85%)	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.30	1.96	0.35	1.79	0.83	0.71	0.12	0.65	6.39	5.43	0.96	4.98
SCHOOL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	0.37	0.00	0.37	0.04	3.46	0.00	3.46	0.35	16.34	0.00	16.34	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.35	0.00	11.35	1.14
ESTATE	0.90	0.10	25	5.50	1.38	4.13	1.65	5.39	1.35	4.04	1.62	33.58	8.40	25.19	10.07	7.43	1.86	5.57	2.23	7.44	1.86	5.58	2.23	25.14	6.29	18.86	7.54
				6.73	2.15	4.59	2.39	10.49	2.58	7.91	3.11	57.82	13.62	44.20	16.68	9.88	3.81	6.07	4.04	8.48	2.57	5.91	2.90	43.65	11.72	31.93	13.74
						Weighted C =	0.35			Weighted C =	0.30			Weighted C =	0.29			Weighted C =	0.41			Weighted C =	0.34			Weighted C =	0.31

VILLAGE 14 PLANNING AREAS 16/19
BIOFILTRATION BMP DMA CALCULATIONS

	Imp. RF	Pervious RF	% Imp	BASIN 13 BF-1-13	Imp Area	Pervious Area	Summation RF x A	BASIN 14 BF-1-14	Imp Area	Pervious Area	Summation RF x A	BMP 15 BF-3-1	Imp Area	Pervious Area	Summation RF x A	BMP 16 BF-3-2	Imp Area	Pervious Area	Summation RF x A	BMP 17 BF-3-3	Imp Area	Pervious Area	Summation RF x A	BASIN 18 BF-3-4	Imp Area	Pervious Area	Summation RF x A
				(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)	
BASIN	0.90	0.10	0	1.05	0.00	1.05	0.11	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PUMP STATION	0.90	0.10	85	0.34	0.29	0.05	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (50% Imp)	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (60% imp)	0.90	0.10	60	17.52	10.51	7.01	10.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	0	0.53	0.00	0.53	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU-1/CF	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (80% imp)	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.14	0.04	0.13
ROAD (85%)	0.90	0.10	85	3.22	2.74	0.48	2.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (100%)	0.90	0.10	100	0.00	0.00	0.00	0.00	0.93	0.93	0.00	0.84	0.32	0.32	0.00	0.29	0.55	0.55	0.00	0.50	0.30	0.30	0.00	0.27	0.00	0.00	0.00	0.00
SCHOOL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	1.85	0.00	1.85	0.19	0.05	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.54	0.00	0.54	0.05	1.35	0.00	1.35	0.14	0.00	0.00	0.00	0.00
ESTATE	0.90	0.10	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.17	0.50	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				24.51	13.54	10.97	13.28	1.01	0.93	0.08	0.85	0.99	0.49	0.50	0.49	1.09	0.55	0.54	0.55	1.65	0.30	1.35	0.41	0.18	0.14	0.04	0.13
						Weighted C =	0.54			Weighted C =	0.84			Weighted C =	0.49			Weighted C =	0.50			Weighted C =	0.25			Weighted C =	0.74

VILLAGE 14 PLANNING AREAS 16/19

BIOFILTRATION BMP DMA CALCULATIONS

	Imp. RF	Pervious RF	% Imp	BMP 19 BF-3-5 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00
PUMP STATION	0.90	0.10	85	0.00	0.00	0.00	0.00
SF (50% Imp)	0.90	0.10	50	0.00	0.00	0.00	0.00
SF (60% imp)	0.90	0.10	60	0.00	0.00	0.00	0.00
PARK	0.90	0.10	0	0.00	0.00	0.00	0.00
MU-1/CF	0.90	0.10	85	0.00	0.00	0.00	0.00
ROAD (80% imp)	0.90	0.10	80	0.00	0.00	0.00	0.00
ROAD (85%)	0.90	0.10	85	1.00	0.85	0.15	0.78
ROAD (100%)	0.90	0.10	100	0.00	0.00	0.00	0.00
SCHOOL	0.90	0.10	85	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	0.00	0.00	0.00	0.00
ESTATE	0.90	0.10	25	0.00	0.00	0.00	0.00
				1.00	0.85	0.15	0.78
						Weighted C =	0.78

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	BF-1-1	BF-1-2	BF-1-3	BF-1-4	BF-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9	BF-1-10	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.100	0.100	0.100	0.100	0.050	0.000	0.000	0.000	0.000	0.000	in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	3,676,900	3,564,950	148,104	121,968	168,142	106,722	93,654	115,870	593,287	165,964	sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)	0										sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)	4,740,200	3,458,228	53,579	29,185	121,097	344,560	199,505	341,075	1,021,918	264,409	sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)						43,560			903,434		sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces Directed to Dispersion Area per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil Serving as Dispersion Area per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil Serving as Dispersion Area per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	8,417,100	7,023,178	201,683	151,153	289,239	494,842	293,159	456,945	2,518,639	430,373	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.45	0.51	0.69	0.75	0.57	0.29	0.36	0.30	0.36	0.41	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.45	0.51	0.69	0.75	0.57	0.29	0.36	0.30	0.36	0.41	unitless
	32	Initial Design Capture Volume	164,133	155,212	6,030	4,912	7,144	6,219	4,573	5,940	39,291	7,646	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.45	0.51	0.69	0.75	0.57	0.29	0.36	0.30	0.36	0.41	unitless
	38	Design Capture Volume After Dispersion Techniques	164,133	155,212	6,030	4,912	7,144	6,219	4,573	5,940	39,291	7,646	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.45	0.51	0.69	0.75	0.57	0.29	0.36	0.30	0.36	0.41	unitless
	42	Final Effective Tributary Area	3,787,695	3,581,821	139,161	113,365	164,866	143,504	105,537	137,084	906,710	176,453	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	164,133	155,212	6,030	4,912	7,144	6,219	4,573	5,940	39,291	7,646	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	BF-1-11	BF-12	BF-13	BF-1-14							unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration							unitless
	2	85th Percentile 24-hr Storm Depth	0.52	0.52	0.52	0.52							inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.100	0.000							in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	111,949	510,523	589,802	47,891							sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)	257,440	880,783	477,853	1,767							sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)		510,088									sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces Directed to Dispersion Area per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil Serving as Dispersion Area per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil Serving as Dispersion Area per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	369,389	1,901,394	1,067,655	49,658	0	0	0	0	0	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.34	0.37	0.54	0.87	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.34	0.37	0.54	0.87	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	32	Initial Design Capture Volume	5,442	30,486	24,983	1,872	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.34	0.37	0.54	0.87	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	5,442	30,486	24,983	1,872	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.34	0.37	0.54	0.87	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	42	Final Effective Tributary Area	125,592	703,516	576,534	43,202	0	0	0	0	0	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	5,442	30,486	24,983	1,872	0	0	0	0	0	0	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	BF-1-1	BF-1-2	BF-1-3	BF-1-4	BF-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9	BF-1-10	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.100	0.100	0.100	0.100	0.050	0.000	0.000	0.000	0.000	0.000	in/hr
	2	Effective Tributary Area	3,787,695	3,581,821	139,161	113,365	164,866	143,504	105,537	137,084	906,710	176,453	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.021	0.030	0.023	0.030	0.030	0.030	0.030	0.030	0.030	ratio
	4	Design Capture Volume Tributary to BMP	164,133	155,212	6,030	4,912	7,144	6,219	4,573	5,940	39,291	7,646	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Unlined	Unlined	Unlined	Unlined	Unlined	Lined	Lined	Lined	Lined	Lined	unitless
	6	Provided Biofiltration BMP Surface Area	129,891	90,985	4,231	3,380	5,200	4,350	3,250	4,151	31,041	5,295	sq-ft
	7	Provided Surface Ponding Depth	6	6	6	6	6	6	6	6	6	6	inches
	8	Provided Soil Media Thickness	21	21	21	21	21	21	21	21	21	21	inches
	9	Provided Depth of Gravel Above Underdrain Invert	24	12	12	24	24	12	12	12	12	12	inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	3.50	3.50	0.85	0.85	3.00	1.00	0.75	0.90	2.00	1.00	inches
	11	Provided Depth of Gravel Below the Underdrain	3	3	3	3	3	3	3	3	3	3	inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	6,495	4,549	212	169	130	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.40	0.40	0.40	0.40	0.40	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	2.25	2.25	2.25	2.25	2.25	1.05	1.05	1.05	1.05	1.05	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	18	18	18	18	30	120	120	120	120	120	hours
	17	Volume Retained by BMP	30,849	21,609	1,005	803	1,105	381	284	363	2,716	463	cubic-feet
	18	Fraction of DCV Retained	0.19	0.14	0.17	0.16	0.15	0.06	0.06	0.06	0.07	0.06	ratio
	19	Portion of Retention Performance Standard Satisfied	0.46	0.35	0.42	0.39	0.29	0.07	0.07	0.07	0.08	0.07	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.29	0.20	0.25	0.24	0.16	0.03	0.03	0.03	0.04	0.03	ratio
	21	Design Capture Volume Remaining for Biofiltration	116,534	124,170	4,523	3,733	6,001	6,032	4,436	5,762	37,719	7,417	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.6517	0.5668	0.0340	0.0390	0.4800	0.0470	0.0265	0.0381	0.1869	0.0470	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.22	0.27	0.35	0.50	3.99	0.47	0.35	0.40	0.26	0.38	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	0.22	0.27	0.35	0.50	3.99	0.47	0.35	0.40	0.26	0.38	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	1.30	1.61	2.08	2.99	23.93	2.80	2.11	2.38	1.56	2.30	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	19.80	15.00	15.00	19.80	19.80	15.00	15.00	15.00	15.00	15.00	inches
	29	Drawdown Time for Surface Ponding	19	16	13	10	1	13	17	15	23	16	hours
	30	Drawdown Time for Effective Biofiltration Depth	63	41	34	33	5	32	43	38	58	39	hours
	31	Total Depth Biofiltered	21.10	16.61	17.08	22.79	43.73	17.80	17.11	17.38	16.56	17.30	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	174,801	186,255	6,785	5,600	9,002	9,048	6,654	8,643	56,579	11,126	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	174,801	125,974	6,024	5,600	9,002	6,454	4,635	6,012	42,839	7,635	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	87,401	93,128	3,392	2,800	4,501	4,524	3,327	4,322	28,289	5,563	cubic-feet
	35	Option 2 - Provided Storage Volume	87,401	93,128	3,392	2,800	4,501	4,524	3,327	4,322	28,289	5,563	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Worksheet B.5-1 General Notes:

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

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	BF-1-11	BF-12	BF-13	BF-1-14	-	-	-	-	-	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.100	0.000	-	-	-	-	-	-	in/hr
	2	Effective Tributary Area	125,592	703,516	576,534	43,202	-	-	-	-	-	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	-	-	-	-	-	-	ratio
	4	Design Capture Volume Tributary to BMP	5,442	30,486	24,983	1,872	-	-	-	-	-	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	Lined	Unlined	Lined							unitless
	6	Provided Biofiltration BMP Surface Area	3,800	21,150	39,454	1,325							sq-ft
	7	Provided Surface Ponding Depth	6	6	6	6							inches
	8	Provided Soil Media Thickness	21	21	21	21							inches
	9	Provided Depth of Gravel Above Underdrain Invert	12	12	24	12							inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	2.00	2.00	1.60	0.75							inches
	11	Provided Depth of Gravel Below the Underdrain	3	3	3	3							inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	1,973	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	1.05	1.05	2.25	1.05	0.00	0.00	0.00	0.00	0.00	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	120	18	120	0	0	0	0	0	0	hours
	17	Volume Retained by BMP	333	1,851	9,370	116	0	0	0	0	0	0	cubic-feet
	18	Fraction of DCV Retained	0.06	0.06	0.38	0.06	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.07	0.07	0.74	0.07	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.03	0.03	0.56	0.03	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	5,279	29,571	10,993	1,816	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.1869	0.1869	0.1375	0.0265	n/a	n/a	n/a	n/a	n/a	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	2.13	0.38	0.15	0.86	n/a	n/a	n/a	n/a	n/a	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	2.13	0.38	0.15	0.86	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	12.75	2.29	0.90	5.18	30.00	30.00	30.00	30.00	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	15.00	15.00	19.80	15.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	29	Drawdown Time for Surface Ponding	3	16	24	7	0	0	0	0	0	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	7	39	79	17	0	0	0	0	0	0	hours
	31	Total Depth Biofiltered	27.75	17.29	20.70	20.18	30.00	30.00	30.00	30.00	30.00	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	7,919	44,357	16,490	2,724	0	0	0	0	0	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	7,919	30,475	16,490	2,229	0	0	0	0	0	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	3,959	22,178	8,245	1,362	0	0	0	0	0	0	cubic-feet
	35	Option 2 - Provided Storage Volume	3,959	22,178	8,245	1,362	0	0	0	0	0	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	Yes	Yes	-	-	-	-	-	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	Deficit of Effectively Treated Stormwater	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	cubic-feet

Worksheet B.5-1 General Notes:

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

Automated Worksheet B.5-3: Alternate Minimum Biofiltration Footprint Ratio (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Info	0	Drainage Basin ID or Name	BF-1-1	BF-1-2	BF-1-3	BF-1-4	BF-5	BF-1-6	BF-1-7	BF-1-8	BF-19	BF-1-10	unitless
	1	Drains to following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	Final Effective Tributary Area	3,787,695	3,581,821	139,161	113,365	164,866	143,504	105,537	137,084	906,710	176,453	sq-ft
Biofiltration Clogging Inputs	3	Is Proposed Biofiltration BMP <3% of Effective Tributary Area Desired?	No	Yes	No	Yes	No	No	No	No	No	No	yes/no
	4	Average Annual Precipitation		11.0		11.0							inches
	5	Load to Clog (default =2.0)		2.0		2.0							lb/sq-ft
	6	Allowable Period to Accumulate Clogging Load (default =10)		10		10							years
	7	Pretreatment Measures Included?		Yes		No							yes/no
	8	Commercial: TSS=128 mg/L, C= 0.80											sq-ft
	9	Education: TSS=132 mg/L, C= 0.50		185,056									sq-ft
	10	Industrial: TSS=125 mg/L, C= 0.90											sq-ft
	11	Low Traffic Areas: TSS=50 mg/L, C= 0.50											sq-ft
	12	Multi-Family Residential: TSS=40 mg/L, C= 0.60		553,835									sq-ft
	13	Roof Areas: TSS=14 mg/L, C= 0.90		64,647									sq-ft
	14	Single Family Residential: TSS=123 mg/L, C= 0.40		718,675									sq-ft
	15	Transportation: TSS=78 mg/L, C= 0.90		280,583		91,476							sq-ft
	16	Vacant/Open Space: TSS=216 mg/L, C= 0.10		1,779,025		21,889							sq-ft
Minimum Footprint Calculations	17	Effective-Area Based on Specified Land Use Coefficients	0	1,200,909	0	84,517	0	0	0	0	0	0	sq-ft
	18	Average TSS Concentration for Tributary	0	100	0	82	0	0	0	0	0	0	mg/L
	19	Average Annual Runoff	0	3,283,336	0	103,918	0	0	0	0	0	0	cubic-feet
	20	Average Annual TSS Load	0	20,497	0	532	0	0	0	0	0	0	lb/yr
	21	Average Annual TSS Load After Pretreatment Measures	0	15,373	0	532	0	0	0	0	0	0	lb/yr
	22	Minimum Allowable Biofiltration Footprint Ratio	0.030	0.021	0.030	0.023	0.030	0.030	0.030	0.030	0.030	0.030	ratio

Worksheet B.5-3 General Notes:

A. Applicants may use this worksheet to calculate Alternate Minimum Biofiltration Footprint Ratios for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Inputs for Lines 4-7 (precipitation, load to clog, clogging period, and pretreatment measures) must be supported through supplemental documentation.

Automated Worksheet B.5-3: Alternate Minimum Biofiltration Footprint Ratio (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Info	0	Drainage Basin ID or Name	BF-1-11	BF-12	BF-13	BF-1-14	-	-	-	-	-	-	unitless
	1	Drains to following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	-	-	-	unitless
	2	Final Effective Tributary Area	125,592	703,516	576,534	36,957	-	-	-	-	-	-	sq-ft
Biofiltration Clogging Inputs	3	Is Proposed Biofiltration BMP <3% of Effective Tributary Area Desired?	No	Yes	No	No	No	No	No	No	No	No	yes/no
	4	Average Annual Precipitation		11.0									inches
	5	Load to Clog (default =2.0)		2.0									lb/sq-ft
	6	Allowable Period to Accumulate Clogging Load (default =10)		10									years
	7	Pretreatment Measures Included?		No									yes/no
	8	Commercial: TSS=128 mg/L, C= 0.80											sq-ft
	9	Education: TSS=132 mg/L, C= 0.50											sq-ft
	10	Industrial: TSS=125 mg/L, C= 0.90											sq-ft
	11	Low Traffic Areas: TSS=50 mg/L, C= 0.50		90,418									sq-ft
	12	Multi-Family Residential: TSS=40 mg/L, C= 0.60											sq-ft
	13	Roof Areas: TSS=14 mg/L, C= 0.90											sq-ft
	14	Single Family Residential: TSS=123 mg/L, C= 0.40		405,244									sq-ft
	15	Transportation: TSS=78 mg/L, C= 0.90		12,513									sq-ft
	16	Vacant/Open Space: TSS=216 mg/L, C= 0.10		195,341									sq-ft
Minimum Footprint Calculations	17	Effective-Area Based on Specified Land Use Coefficients	0	238,102	0	0	0	0	0	0	0	0	sq-ft
	18	Average TSS Concentration for Tributary	0	115	0	0	0	0	0	0	0	0	mg/L
	19	Average Annual Runoff	0	644,890	0	0	0	0	0	0	0	0	cubic-feet
	20	Average Annual TSS Load	0	4,630	0	0	0	0	0	0	0	0	lb/yr
	21	Average Annual TSS Load After Pretreatment Measures	0	4,630	0	0	0	0	0	0	0	0	lb/yr
	22	Minimum Allowable Biofiltration Footprint Ratio	0.030	0.030	0.030	0.030	-	-	-	-	-	-	ratio

Worksheet B.5-3 General Notes:

A. Applicants may use this worksheet to calculate Alternate Minimum Biofiltration Footprint Ratios for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Inputs for Lines 4-7 (precipitation, load to clog, clogging period, and pretreatment measures) must be supported through supplemental documentation.

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
General Info	0	Drainage Basin ID or Name	BF-1-1	BF-1-2	BF-1-3	BF-1-4	BF-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9	BF-1-10	unitless
	1	85th Percentile Storm Depth	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.100	0.100	0.100	0.100	0.050	0.000	0.000	0.000	0.000	0.000	in/hr
	3	Total Tributary Area	8,417,100	7,023,178	201,683	151,153	289,239	494,842	293,159	456,945	2,518,639	430,373	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	364,741	304,338	8,740	6,550	12,534	21,443	12,704	19,801	109,141	18,649	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.45	0.51	0.69	0.75	0.57	0.29	0.36	0.30	0.36	0.41	unitless
	6	Initial Design Capture Volume	164,133	155,212	6,030	4,912	7,144	6,219	4,573	5,940	39,291	7,646	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	3,787,695	3,581,821	139,161	113,365	164,866	143,504	105,537	137,084	906,710	176,453	square feet
	10	Final Design Capture Volume Tributary to BMP	164,133	155,212	6,030	4,912	7,144	6,219	4,573	5,940	39,291	7,646	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	47,599	31,042	1,508	1,179	1,143	187	137	178	1,572	229.38	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.29	0.20	0.25	0.24	0.16	0.03	0.03	0.03	0.04	0.03	fraction
	14	Percent of Average Annual Runoff Retention Provided	36.3%	27.5%	32.4%	31.4%	22.6%	4.6%	4.6%	4.6%	6.1%	4.6%	%
	15	Percent of Average Annual Runoff Retention Required	22.2%	22.2%	22.2%	22.2%	14.8%	4.5%	4.5%	4.5%	4.5%	4.5%	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	0	0	0	0	0	0	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

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

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the SWQMP submittal package.

False

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
General Info	0	Drainage Basin ID or Name	BF-1-11	BF-12	BF-13	BF-1-14	-	-	-	-	-	-	unitless
	1	85th Percentile Storm Depth	0.52	0.52	0.52	0.52	-	-	-	-	-	-	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.100	0.000	-	-	-	-	-	-	in/hr
	3	Total Tributary Area	369,389	1,901,394	1,067,655	49,658	-	-	-	-	-	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	16,007	82,394	46,265	2,152	-	-	-	-	-	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.34	0.37	0.54	0.87	-	-	-	-	-	-	unitless
	6	Initial Design Capture Volume	5,442	30,486	24,983	1,872	-	-	-	-	-	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	-	-	-	-	-	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	-	-	-	-	-	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	125,592	703,516	576,534	43,202	-	-	-	-	-	-	square feet
	10	Final Design Capture Volume Tributary to BMP	5,442	30,486	24,983	1,872	-	-	-	-	-	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	-	-	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	163	915	13,990	56	-	-	-	-	-	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.03	0.03	0.56	0.03	-	-	-	-	-	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	4.6%	4.6%	58.8%	4.6%	-	-	-	-	-	-	%
	15	Percent of Average Annual Runoff Retention Required	4.5%	4.5%	22.2%	4.5%	-	-	-	-	-	-	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	-	-	-	-	-	-	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	-	-	-	-	-	-	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	-	-	-	-	-	-	cubic-feet

Summary Notes:

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

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the SWQMP submittal package.

False

BMP 15: BF-3-1

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

Category	#	Description	Value	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	BMP-15	unitless
	1	Total Tributary Area	43,124	sq-ft
	2	Final Adjusted Runoff Factor	0.49	unitless
	3	Design Capture Volume	923	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	0	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	0	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP	0.175	CFS
Flow Rate Calculations	7	Adjustment Factor	1.0	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.097	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	YES	unitless

$Q_{TREAT} = 1.5 * Q$

$= 0.146$ cfs

USE MODEL

MWS L-4-15

(Capacity = 0.175 cfs)

BMP 16: BF-3-2

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

Category	#	Description	Value	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	BMP 16	unitless
	1	Total Tributary Area	47,480	sq-ft
	2	Final Adjusted Runoff Factor	0.50	unitless
	3	Design Capture Volume	1,036	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	0	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	0	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP	0.175	CFS
Flow Rate Calculations	7	Adjustment Factor	1.0	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.109	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	YES	unitless

$Q_{TREAT} = 1.5 * Q$
$= 0.164$ cfs

USE MODEL
MWS L-4-15
(Capacity = 0.175 cfs)

BMP 17: BF-3-3

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

Category	#	Description	Value	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	BMP17	unitless
	1	Total Tributary Area	71,874	sq-ft
	2	Final Adjusted Runoff Factor	0.25	unitless
	3	Design Capture Volume	764	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	0	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	0	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP		CFS
Flow Rate Calculations	7	Adjustment Factor	1.0	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.083	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?		unitless

$Q_{TREAT} = 1.5 \times Q$

$= 0.125 cfs$

USE MODEL

MWS L-4-13-UG
W/ INTERNAL PEAK FLOW BYPASS
(CAPACITY = 0.144 cfs)

BMP 18: BF-3-4

Appendix B: Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods

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

Category	#	Description	Value	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	BMP 18	unitless
	1	Total Tributary Area	8,015	sq-ft
	2	Final Adjusted Runoff Factor	0.74	unitless
	3	Design Capture Volume	2.51	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	0	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	0	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP	0.049	CFS
Flow Rate Calculations	7	Adjustment Factor	1.0	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.027	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	YES	unitless

PROJECT STREET AREA

$Q_{TREAT} = 1.5 * Q$

$= 0.0405$ cfs

USE MODEL

MWS L-4-4

(Capacity = 0.049 cfs)

BMP 19:
BF-3-5

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

Category	#	Description	Value	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	BMP-19	unitless
	1	Total Tributary Area	43,379	sq-ft
	2	Final Adjusted Runoff Factor	0.78	unitless
	3	Design Capture Volume	1,472	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	0	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	0	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP	0.117 ea	CFS
Flow Rate Calculations	7	Adjustment Factor	1.0	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.1560	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	YES	unitless

$Q_{TREAT} = 1.5 * Q$

$= 0.234$

$Q_{TREAT} = \frac{0.234}{2}$

$= 0.117$ cfs PER EACH SIDE OF STREET

USE MODEL:
2 ~ MWS L-4-8

DMA ID	DMA Surface Type (roof, street, etc.)	DMA Area (acres)	DCV (cf)	DMA Type[1]	Structural BMP ID	Proposed Structural BMP Type[2]	Structural BMP Size[3]	WQ Ponding Depth (in.)	Media Thickness (in.)	Gravel Thickness (in.)
1	Pavement, roof, sdwk,landscaping	193.23	164,133	Drains to BMP	BF-1-1	Biofiltration Basin	129,891 sf bottom	6	18	24
2	Paver, roof, sdwk,landscaping	161.23	155,212	Drains to BMP	BF-1-2	Biofiltration Basin	90,985 sf bottom	6	18	12
3	Pavement, sdwk, slopes	4.63	6,030	Drains to BMP	BF-1-3	Biofiltration Basin	4,231 sf bottom	6	18	12
4	Pavement, sdwk, slopes	3.47	4,912	Drains to BMP	BF-1-4	Biofiltration Basin	3,380 sf bottom	6	18	24
5	Pavement, sdwk slopes	6.64	7,144	Drains to BMP	BF-1-5	Biofiltration Basin	5,200 sf bottom	6	18	24
6	Pavement, roof, sdwk,landscaping	11.37	6,219	Drains to BMP	BF-1-6	Biofiltration Basin	4,350 sf bottom	6	18	12
7	Pavement, roof, sdwk,landscaping	6.73	4,573	Drains to BMP	BF-1-7	Biofiltration Basin	3,250 sf bottom	6	18	12
8	Pavement, roof, sdwk,landscaping	10.49	5,940	Drains to BMP	BF-1-8	Biofiltration Basin	4,151 sf bottom	6	18	12
9	Pavement, roof, sdwk, slopes	57.81	39,291	Drains to BMP	BF-1-9	Biofiltration Basin	31,041 sf bottom	6	18	12
10	Pavement, roof, sdwk,landscaping	9.88	7,646	Drains to BMP	BF-1-10	Biofiltration Basin	5295 sf bottom	6	18	18
11	Pavement, roof, sdwk,landscaping	8.48	5,442	Drains to BMP	BF-1-11	Biofiltration Basin	3800 sf bottom	6	18	12
12	Pavement, roof, sdwk, slopes	43.65	30,486	Drains to BMP	BF-1-12	Biofiltration Basin	21,150 sf bottom	6	18	12
13	Pavement, roof, sdwk,landscaping	24.51	24,983	Drains to BMP	BF-1-13	Biofiltration Basin	34,454 sf bottom	6	18	24
14	Pavement, sdwk, slopes	1.14	1,872	Drains to BMP	BF-1-14	Biofiltration Basin	1,325 sf bottom	6	18	12
15	Pavement, sdwk, slopes	0.99		Drains to BMP	BF-3-1	Proprietary Flow-Through TC BMP	WQ Flow= 0.146 cfs	MWS L-4-15	N/A	N/A
16	Pavement, sdwk, slopes	1.09		Drains to BMP	BF-3-2	Proprietary Flow-Through TC BMP	WQ Flow= 0.164 cfs	MWS L-4-15	N/A	N/A
17	Pavement, sdwk, slopes	1.65		Drains to BMP	BF-3-3	Proprietary Flow-Through TC BMP	WQ Flow= 0.125 cfs	MWS L-4-13-UG	N/A	N/A
18	Pavement, sdwk, slopes	0.18		Drains to BMP	BF-3-4	Proprietary Flow-Through TC BMP	WQ Flow= 0.0405 cfs	MWS L-4-4-UG	N/A	N/A
19	Pavement, sdwk,	1.00		Drains to BMP	BF-3-5	Proprietary Flow-Through TC BMP	WQ Flow= 0.117 cfs EA	2- MWS L-4-8	N/A	N/A

[1] DMA Type can only be: 1) Drains to BMP, 2) Self-mitigating, 3) De Minimis, or 4) Self-retaining
[2] BMP Type must be consistent with terminology in the *BMP Design Manual* and/or CASQA Fact Sheets
[3] Structural BMP Size is typically presented as an area (sq. ft.) or size (e.g., proprietary devices)

ATTACHMENT 1b
FORM I-8, CATEGORIZATION OF
INFILTRATION FEASIBILITY CONDITION

Categorization of Infiltration Feasibility Condition	Form I-8 Basins BF-1-6 - BF-1-12 & BF-3-1

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:
Eight (8) borehole percolation tests were performed in proposed BMP locations and in varying geologic regimes. Testing within the Santiago Peak Volcanics (metavolcanic bedrock) was not performed as part of this investigation. However, six (6) borehole percolation tests were performed onsite within the Santiago Peak Volcanics as part of our *Feasibility Study for Onsite Wastewater Treatments Systems, Otay Ranch Village 14 and Planning Areas 16 and 19, County of San Diego, California, Report No. 1312-02-B-8, dated March 28, 2017*. This geologic unit is anticipated to underlie proposed basins BF-1-6 through BF-1-12 and BF-3-1. Utilizing the percolation rates determined in the referenced septic feasibility study then converting to infiltration rates using the "Porchet Method" yielded raw infiltration rates between 0.00 and 0.05 inches/hour. Reducing these rates using a Factor of Safety of 2.0 (maximum allowed factor of safety for preliminary feasibility screening) to provide preliminary design rates yielded rates between 0.00 inches/hour and 0.03 inches/hour. The infiltration rates at the locations tested are less than 0.5 inches/hour. Full infiltration is not feasible for basins founded within Santiago Peak Volcanics. A more detailed discussion of our testing and findings is presented in the *Infiltration Feasibility Study, Otay Ranch – Village 14 and Planning Areas 16 and 19, County of San Diego, California, Report No. 1312-02-B-7 dated February 21, 2017.*
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:
Preliminary design infiltration rates at the project site are less than 0.5 inches/hour. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable.

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

Form I-8 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: Preliminary design infiltration rates at the project site are less than 0.5 inches/hour. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable. 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: The design infiltration rates at the project site are less than 0.5 inches/hour. Infiltration at a rate greater than 0.5 inches/hour is not feasible for this project. As such, this screening question does not control the feasibility of infiltration at the project site. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project design engineer. 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		NO

**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*

Form I-8 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 discussed in our response to Criteria No. 1, site specific infiltration testing within the Santiago Peak Volcanics geologic unit yielded design infiltration rates ranging between 0.00 and 0.03 inches per hour with a factor of safety of 2 applied. The bedrock of the Santiago Peak Volcanics is impermeable. The minor amount of 'infiltration' observed in limited test holes occurred through lateral flow within or along the colluvium/bedrock contact or through fracture flow. It is our professional opinion that the Santiago Peak Volcanics are not suitable for long term infiltration and that any fracture flow that may occur initially will greatly diminish over time due to natural sedimentation processes that cannot be mitigated. Where infiltration BMPs are founded in Santiago Peak Volcanics, the geologic conditions do not allow for infiltration in any appreciable rate or volume. It is recommended that for preliminary design purposes, a design infiltration rate of 0.00 inches/hour be used for basins BF-1-6 through BF-1-12 and BF-3-1. When finalized plans become available, additional BMP specific testing may be warranted. 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: Due to the inherent impermeability of the Santiago Peak Volcanics, long term vertical infiltration is not feasible. Infiltration within this geologic unit, in any appreciable quantity, cannot be allowed without significantly increasing the risk of geotechnical hazards that cannot be mitigated to an acceptable level. Potential hazards include: slope instability, daylight seepage on slope faces, groundwater mounding, settlement of nearby structures, and water intrusion in utility trenches. When finalized plans become available, BMP specific evaluation and testing may be warranted. 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.			

Form I-8 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: There are no known water supply wells within 100 feet of the project site. According to the State Water Board's Geotracker website, the closest site with contamination issues is located approximately 500 north/northwest from the site and 1,500 feet from the nearest proposed BMP. The site is reported as a LUST cleanup, and the case has been closed since October 2006. Land use in the project vicinity is predominantly single-family residential with locally interspersed agricultural and equestrian uses. There are no known contamination risks from current land use activities. The proposed development will primarily be residential with localized retail. No industrial or light industrial uses are currently proposed. As such, we do not anticipate that construction of the proposed infiltration BMPs will pose significant risk for groundwater related concerns. 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: There is no apparent evidence that construction of the proposed BMP basins would divert or otherwise preclude flow to downstream water bodies. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project 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.			
Part 2 Result*	If all answers from row 5-8 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

**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 the Agency/Jurisdictions to substantiate findings*

Categorization of Infiltration Feasibility Condition	Form I-8 Basins BF-1-1 – BF-1-4 & BF-3-2

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:
Eight (8) borehole percolation tests were performed in proposed BMP locations and in varying geologic regimes. Three of the tests (P-1, P-2, and P-5) were located within Quaternary age Older Alluvium. This geologic unit is anticipated to underlie proposed basins BF-1-1 through BF-1-4 and BF-3-2. Testing was performed in general conformance with Appendix D, Section D.3.3.2 of the current BMP Design Manual. The observed percolation rates were then converted to observed infiltration rates using the "Porchet Method". The observed infiltration rates were reduced using a Factor of Safety of 2.0 (maximum allowed factor of safety for preliminary feasibility screening) to provide preliminary design rates. The preliminary design rates ranged from 0.09 inches/hour to 0.32 inches/hour. The infiltration rates at the locations tested are less than 0.5 inches/hour. Full infiltration is not feasible. A more detailed discussion of our testing and findings is presented in the *Infiltration Feasibility Study, Otay Ranch – Village 14 and Planning Areas 16 and 19, County of San Diego, California, Report No. 1312-02-B-7 dated February 21, 2017.*

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:
Preliminary design infiltration rates at the project site are less than 0.5 inches/hour. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable.

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

Form I-8 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: Preliminary design infiltration rates at the project site are less than 0.5 inches/hour. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable. 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: The design infiltration rates at the project site are less than 0.5 inches/hour. Infiltration at a rate greater than 0.5 inches/hour is not feasible for this project. As such, this screening question does not control the feasibility of infiltration at the project site. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project design engineer. 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		NO

**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*

Form I-8 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 discussed in our response to Criteria No. 1, site specific infiltration testing within the Older Alluvium geologic unit yielded design infiltration rates of less than 0.5 inches/hour. Site specific infiltration testing within this unit yielded preliminary infiltration rates ranging between 0.09 and 0.32 inches per hour with a factor of safety of 2 applied. In general the soil and geologic conditions at the subject basin locations allow for infiltration in an 'appreciable' rate or volume. It is recommended that for preliminary design purposes, a design infiltration rate of 0.10 inches/hour be used for basins BF-1-1 through BF-1-4 and BF-3-2. When finalized plans become available, additional BMP specific testing may be warranted.

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:
Partial infiltration can be allowed at the project site without significantly increasing the risk of geotechnical hazards provided appropriate mitigation/remedial grading measures are performed during site development/basin construction. The infiltration surface for the proposed BMPs have not been finalized at this time, however, it is expected that they will be within the native material at the site. When finalized plans become available, BMP specific evaluation and testing may be warranted.

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.

Form I-8 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: There are no known water supply wells within 100 feet of the project site. According to the State Water Board's Geotracker website, the closest site with contamination issues is located approximately 500 north/northwest from the site and 1,500 feet from the nearest proposed BMP. The site is reported as a LUST cleanup, and the case has been closed since October 2006. Land use in the project vicinity is predominantly single-family residential with locally interspersed agricultural and equestrian uses. There are no known contamination risks from current land use activities. The proposed development will primarily be residential with localized retail. No industrial or light industrial uses are currently proposed. As such, we do not anticipate that construction of the proposed infiltration BMPs will pose significant risk for groundwater related concerns. 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: There is no apparent evidence that construction of the proposed BMP basins would divert or otherwise preclude flow to downstream water bodies. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project 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.			
Part 2 Result*	If all answers from row 5-8 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.		YES

**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 the Agency/Jurisdictions to substantiate findings*

Categorization of Infiltration Feasibility Condition	Form I-8 Basins BF-1-5 & BF-1-13

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:
Eight (8) borehole percolation tests were performed in proposed BMP locations and in varying geologic regimes. Five of the tests (P-3, P-4, and P-6 through P-8) were located within Tertiary age Otay Formation - Fanglomerate. This geologic unit is anticipated to underlie proposed basins BF-1-5 and BF-1-13. Testing was performed in general conformance with Appendix D, Section D.3.3.2 of the current BMP Design Manual. The observed percolation rates were then converted to observed infiltration rates using the "Porchet Method". The observed infiltration rates were reduced using a Factor of Safety of 2.0 (maximum allowed factor of safety for preliminary feasibility screening) to provide preliminary design rates. The preliminary design rates ranged from 0.10 inches/hour to 0.36 inches/hour. The infiltration rates at the locations tested are less than 0.5 inches/hour. Full infiltration is not feasible. A more detailed discussion of our testing and findings is presented in the *Infiltration Feasibility Study, Otay Ranch – Village 14 and Planning Areas 16 and 19, County of San Diego, California, Report No. 1312-02-B-7 dated February 21, 2017.*

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:
Preliminary design infiltration rates at the project site are less than 0.5 inches/hour. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable.

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

Form I-8 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: Preliminary design infiltration rates at the project site are less than 0.5 inches/hour. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable. 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: The design infiltration rates at the project site are less than 0.5 inches/hour. Infiltration at a rate greater than 0.5 inches/hour is not feasible for this project. As such, this screening question does not control the feasibility of infiltration at the project site. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project design engineer. 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		NO

**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*

Form I-8 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 discussed in our response to Criteria No. 1, site specific infiltration testing within the Otay Formation - Fanglomerate geologic unit yielded design infiltration rates of less than 0.5 inches/hour. Site specific infiltration testing within this unit yielded preliminary infiltration rates ranging between 0.10 and 0.36 inches per hour with a factor of safety of 2 applied. In general the soil and geologic conditions at the subject basin locations allow for infiltration in an 'appreciable' rate or volume. The composition of the soils/bedrock within the Otay Formation – Fanglomerate is highly variable ranging from coarse grained breccia to very fine grained siltstone and claystone. It is recommended that for preliminary design purposes, a design infiltration rate of 0.05 inches/hour be used for basins BF-1-5 and BF-1-13. When finalized plans become available, additional BMP specific testing may be warranted.

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:
Partial infiltration can be allowed at the project site without significantly increasing the risk of geotechnical hazards provided appropriate mitigation/remedial grading measures are performed during site development/basin construction. The infiltration surface for the proposed BMPs have not been finalized at this time, however, it is expected that they will be within the native material at the site. When finalized plans become available, BMP specific evaluation and testing may be warranted.

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.

Form I-8 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: There are no known water supply wells within 100 feet of the project site. According to the State Water Board's Geotracker website, the closest site with contamination issues is located approximately 500 north/northwest from the site and 1,500 feet from the nearest proposed BMP. The site is reported as a LUST cleanup, and the case has been closed since October 2006. Land use in the project vicinity is predominantly single-family residential with locally interspersed agricultural and equestrian uses. There are no known contamination risks from current land use activities. The proposed development will primarily be residential with localized retail. No industrial or light industrial uses are currently proposed. As such, we do not anticipate that construction of the proposed infiltration BMPs will pose significant risk for groundwater related concerns. 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: There is no apparent evidence that construction of the proposed BMP basins would divert or otherwise preclude flow to downstream water bodies. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project 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.			
Part 2 Result*	If all answers from row 5-8 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.		YES

**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 the Agency/Jurisdictions to substantiate findings*

Infiltration rate based on email below with corresponding values included within the 'Conclusion and Recommendations' section of the Village 14 Geotechnical study. See excerpt on following sheet.

Raymond Escobar

From: PJ DeRisi <pauld@adv-geosolutions.com>
Sent: Tuesday, February 21, 2017 3:08 PM
To: Raymond Escobar
Subject: Otay Ranch Village 14 Infiltration Feasibility Report
Attachments: 1312-02 Infiltration Feasibility Report FINAL DRAFT 2-21-17.pdf

Raymond,
Final draft of the report is attached. Geology at each basin location...
BF-1-1 Qoal
BF-1-2 Qoal

BF-1-3 Qoal
BF-1-4 Qoal
BF-1-5 Tof
BF-1-6 Qal/Jsp (no infiltration due to shallow gw)
BF-1-7 thru 1-12 Jsp
BF-1-13 Tof
BF-3-1 Jsp
BF-3-2 Qoal
--
P.J. DeRisi, PG, CEG
Principal Geologist

Vice President

Advanced Geotechnical Solutions, Inc.

San Diego Office
9707 Waples Street, Suite 150
San Diego, CA 92121

Telephone: (619) 850-3980
Fax: (714) 409-3287

pauld@adv-geosolutions.com

BASIN	Inf. Rate in/hr
1	0.10
2	0.10
3	0.10
4	0.10
5	0.05
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0.10
14	0

angular, gravel to cobble size clasts in a clayey sand matrix. Occasional to common boulder sized clasts were encountered in our borings and excavator test pits. Rock clasts appear to be locally derived from the Santiago Peak Volcanics. The clay matrix is commonly waxy, highly expansive, and is likely bentonitic. The finer grained subunit is generally comprised of olive gray to pale brownish yellow, sandy claystone and clayey sandstone in slightly moist to moist and soft to hard condition. Tested infiltration rates within the Fanglomerate ranged from 0.20 to 0.72 inches/hour and are expected to vary from location to location due to variations in density and percentage of coarse-grained material (sand and gravel) versus fine-grained material (silt and clay). It is estimated that infiltration rates within the Fanglomerate will predominantly range between 0.05 and 0.20 inches/hour. For preliminary design purposes, it is recommended that the lower bound value of 0.05 be used. It should be noted that discrete bentonitic claystone lenses are common within the Otay Formation. These lenses are highly expansive and impermeable. Infiltration in areas where bentonitic claystone is present should be avoided.

4.4.3 Santiago Peak Volcanics

Santiago Peak Volcanics were not encountered during subsurface exploration for this study. However, subsurface excavations for previous geotechnical studies on the project site indicate the Santiago peak Volcanics are generally dense and mildly metamorphosed volcanic rocks. Composition of the volcanic rocks varies from basalt to rhyolite but is predominantly dacite and andesite. Typically the meta-volcanics display crude to moderate bedding and foliation. Fracturing is poorly to moderately well developed. In general, outside of boulder areas, a weathered halo of only a few feet thick exists. Below this, the rock is very dense and hard. The bedrock of the Santiago Peak Volcanics is impermeable. Flow of water through the Santiago Peak Volcanics occurs through fractures in the bedrock. Fracture networks within the bedrock are highly variable and accurate prediction of flow path is rarely possible. It is estimated that infiltration rates within the Santiago Peak Volcanics will predominantly range between 0.00 and 0.10 inches/hour. For preliminary design purposes, it is recommended that no infiltration be used.

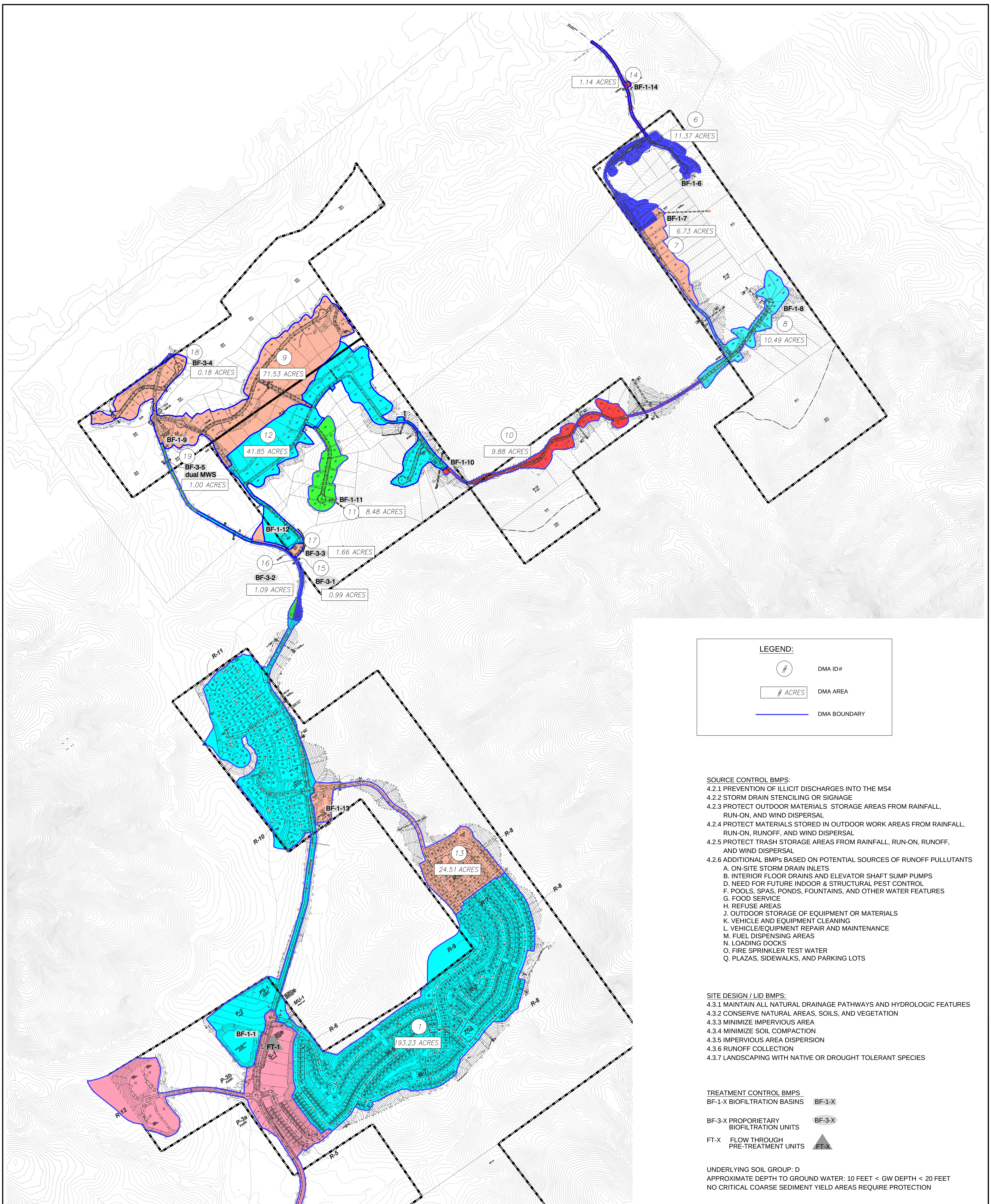
4.5 Proximity to Water Supply Wells

No water supply wells are known to exist within 100 feet of the proposed basins.

5. CONCLUSIONS AND RECOMMENDATIONS

Several BMP basins are proposed throughout the project site and will be situated in varying soil/geologic units. Eight (8) borehole infiltration tests were performed at the locations depicted on the attached plans (Plates 1 through 3). Based on our site specific testing, partial infiltration in the areas tested is considered feasible. A lower bound preliminary design infiltration rate of 0.09 inches/hour was determined using a factor of safety of 2. However, it is recommended that a rate of 0.05 inches/hour be utilized in preliminary design of BMP basins sited within areas underlain by Otay Formation – Fanglomerate and a rate of 0.10 inches/hour be utilized in areas underlain by Older Alluvium. It is further recommended that no infiltration be utilized in preliminary design of BMP based sited in areas underlain by Santiago Peak Volcanics. Dependent upon the final location, size, and depth of the BMP basins, verification of the specific soil/geologic conditions and additional testing may be warranted.

ATTACHMENT 1c
DMA EXHIBIT



LEGEND:

#	DMA ID#
# ACRES	DMA AREA
(blue line)	DMA BOUNDARY

SOURCE CONTROL BMPS:

4.2.1 PREVENTION OF ILLICIT DISCHARGES INTO THE MS4
4.2.2 STORM DRAIN STENCILING OR SIGNAGE
4.2.3 PROTECT OUTDOOR MATERIALS STORAGE AREAS FROM RAINFALL, RUN-ON, AND WIND DISPERSAL
4.2.4 PROTECT MATERIALS STORED IN OUTDOOR WORK AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
4.2.5 PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
4.2.6 ADDITIONAL BMPs BASED ON POTENTIAL SOURCES OF RUNOFF PULLUTANTS
- A. ON-SITE STORM DRAIN INLETS
- B. INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
- D. NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- F. POOLS, SPAS, PONDS, FOUNTAINS, AND OTHER WATER FEATURES
- G. FOOD SERVICE
- H. REFUSE AREAS
- J. OUTDOOR STORAGE OF EQUIPMENT OR MATERIALS
- K. VEHICLE AND EQUIPMENT CLEANING
- L. VEHICLE/EQUIPMENT REPAIR AND MAINTENANCE
- M. FUEL DISPENSING AREAS
- N. LOADING DOCKS
- O. FIRE SPRINKLER TEST WATER
- Q. PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN / LID BMPS:

4.3.1 MAINTAIN ALL NATURAL DRAINAGE PATHWAYS AND HYDROLOGIC FEATURES
4.3.2 CONSERVE NATURAL AREAS, SOILS, AND VEGETATION
4.3.3 MINIMIZE IMPERVIOUS AREA
4.3.4 MINIMIZE SOIL COMPACTION
4.3.5 IMPERVIOUS AREA DISPERSION
4.3.6 RUNOFF COLLECTION
4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

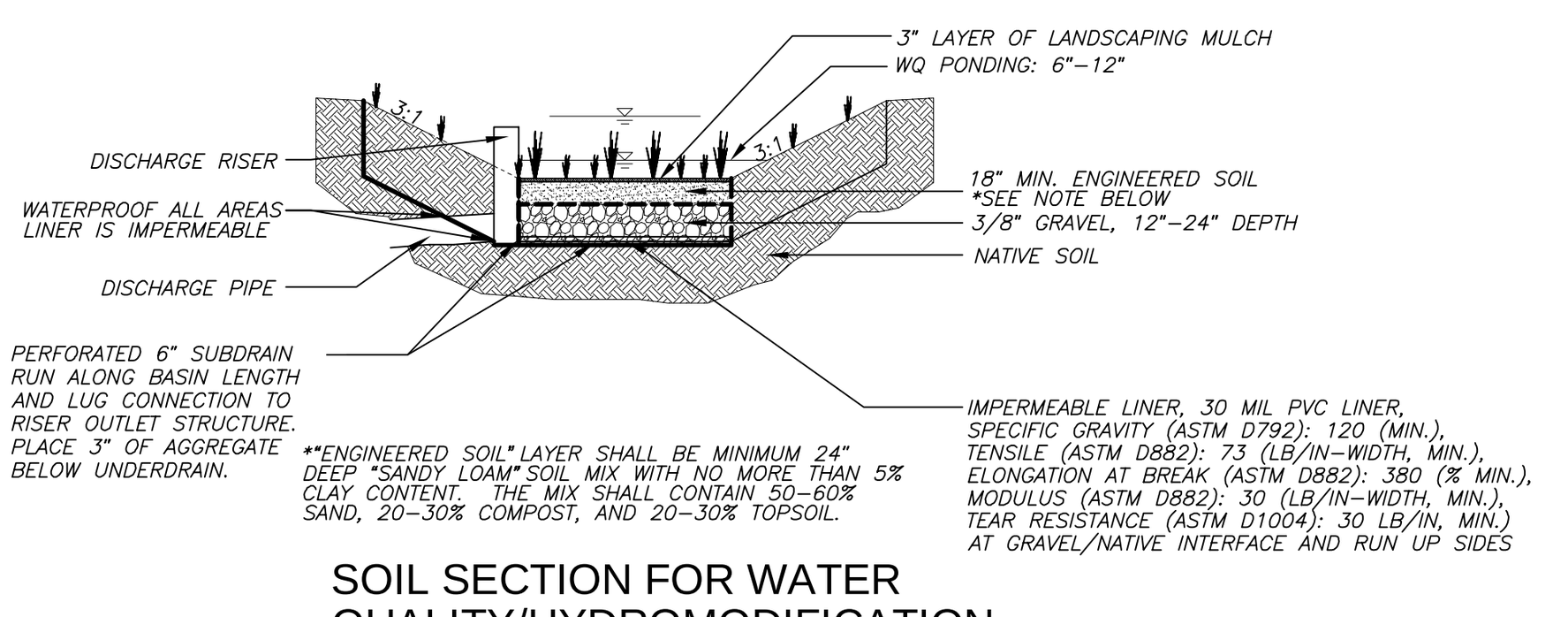
TREATMENT CONTROL BMPS

BF-1-X BIOFILTRATION BASINS — BF-1-X

BF-3-X PROPORIETARY BIOFILTRATION UNITS — BF-3-X

FT-X FLOW THROUGH PRE-TREATMENT UNITS — FT-X

UNDERLYING SOIL GROUP: D
APPROXIMATE DEPTH TO GROUND WATER: 10 FEET < GW DEPTH < 20 FEET
NO CRITICAL COARSE SEDIMENT YIELD AREAS REQUIRE PROTECTION



SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE — BASINS 1-14

DMA ID	DMA Surface Type (roof, street, etc.)	DMA Area (acres)	DCV (cf)	DMA Type[1]	Structural BMP ID	Proposed Structural BMP Type[2]	Structural BMP Size[3]	WQ Ponding Depth (in.)	Media Thickness (in.)	Gravel Thickness (in.)
1	Pavement, roof, sdwk,landscaping	193.23	164,133	Drains to BMP	BF-1-1	Biofiltration Basin	129,891 sf bottom	6	18	24
2	Paver, roof, sdwk,landscaping	161.23	155,212	Drains to BMP	BF-1-2	Biofiltration Basin	90,985 sf bottom	6	18	12
3	Pavement, sdwk, slopes	4.63	6,030	Drains to BMP	BF-1-3	Biofiltration Basin	4,231 sf bottom	6	18	12
4	Pavement, sdwk, slopes	3.47	4,912	Drains to BMP	BF-1-4	Biofiltration Basin	3,380 sf bottom	6	18	24
5	Pavement, sdwk slopes	6.64	7,144	Drains to BMP	BF-1-5	Biofiltration Basin	5,200 sf bottom	6	18	24
6	Pavement, roof, sdwk,landscaping	11.37	6,219	Drains to BMP	BF-1-6	Biofiltration Basin	4,350 sf bottom	6	18	12
7	Pavement, roof, sdwk,landscaping	6.73	4,573	Drains to BMP	BF-1-7	Biofiltration Basin	3,250 sf bottom	6	18	12
8	Pavement, roof, sdwk,landscaping	10.49	5,940	Drains to BMP	BF-1-8	Biofiltration Basin	4,151 sf bottom	6	18	12
9	Pavement, roof, sdwk, slopes	57.81	39,291	Drains to BMP	BF-1-9	Biofiltration Basin	31,041 sf bottom	6	18	12
10	Pavement, roof, sdwk,landscaping	9.88	7,646	Drains to BMP	BF-1-10	Biofiltration Basin	5295 sf bottom	6	18	18
11	Pavement, roof, sdwk,landscaping	8.48	5,442	Drains to BMP	BF-1-11	Biofiltration Basin	3800 sf bottom	6	18	12
12	Pavement, roof, sdwk, slopes	43.65	30,486	Drains to BMP	BF-1-12	Biofiltration Basin	21,150 sf bottom	6	18	12
13	Pavement, roof, sdwk,landscaping	24.51	24,983	Drains to BMP	BF-1-13	Biofiltration Basin	34,454 sf bottom	6	18	24
14	Pavement, sdwk, slopes	1.14	1,872	Drains to BMP	BF-1-14	Biofiltration Basin	1,325 sf bottom	6	18	12
15	Pavement, sdwk, slopes	0.99		Drains to BMP	BF-3-1	Proprietary Flow-Through TC BMP	WQ Flow= 0.146 cfs	MWS L-4-15	N/A	N/A
16	Pavement, sdwk, slopes	1.09		Drains to BMP	BF-3-2	Proprietary Flow-Through TC BMP	WQ Flow= 0.164 cfs	MWS L-4-15	N/A	N/A
17	Pavement, sdwk, slopes	1.65		Drains to BMP	BF-3-3	Proprietary Flow-Through TC BMP	WQ Flow= 0.125 cfs	MWS L-4-13-UG	N/A	N/A
18	Pavement, sdwk, slopes	0.18		Drains to BMP	BF-3-4	Proprietary Flow-Through TC BMP	WQ Flow= 0.0405 cfs	MWS L-4-4-UG	N/A	N/A
19	Pavement, sdwk,	1.00		Drains to BMP	BF-3-5	Proprietary Flow-Through TC BMP	WQ Flow= 0.117 cfs EA	2- MWS L-4-8	N/A	N/A

	Imp. RF	Pervious RF	% Imp	BASIN 1 BF-1-1 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 2 BF-1-2 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 3 BF-1-3 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 4 BF-1-4 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 5 BF-1-5 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 6 BF-1-6 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A
BASIN	0.90	0.10	0	4.34	0.00	4.34	0.43	2.09	0.00	2.09	0.21	0.21	0.00	0.21	0.02	0.18	0.00	0.18	0.02	0.12	0.00	0.12	0.01	0.00	0.00	0.00	0.00
MF	0.90	0.10	85	0.00	0.00	0.00	0.00	29.33	24.93	4.40	22.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (50% Imp)	0.90	0.10	50	140.76	70.38	70.38	70.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (60% imp)	0.90	0.10	60	0.00	0.00	0.00	0.00	53.92	32.35	21.57	31.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	14.54	1.45	13.09	2.62	6.89	0.69	6.20	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU-1/CF	0.90	0.10	85	3.21	2.73	0.48	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (80% imp)	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	1.03	0.26	0.95
ROAD (85%)	0.90	0.10	85	11.59	9.85	1.74	9.04	14.86	12.63	2.23	11.59	4.00	3.40	0.60	3.12	3.29	2.80	0.49	2.57	4.83	4.11	0.72	3.77	0.00	0.00	0.00	0.00
SCHOOL	0.90	0.10	85	0.00	0.00	0.00	0.00	9.80	8.33	1.47	7.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	18.79	0.00	18.79	1.88	32.70	0.00	32.70	3.27	0.42	0.00	0.42	0.04	0.00	0.00	0.00	0.00	1.69	0.00	1.69	0.17	2.63	0.00	2.63	0.26
ESTATE	0.90	0.10	25	0.00	0.00	0.00	0.00	11.64	2.91	8.73	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.28	0.82	2.46	0.98
				193.23	84.41	108.82	86.85	**161.23**	81.84	79.39	81.60	**4.63**	3.40	1.23	3.18	**3.47**	2.80	0.67	2.58	**6.64**	4.11	2.53	3.95	**7.20**	1.85	5.35	2.20
						Weighted C =	**0.45**			Weighted C =	**0.51**			Weighted C =	**0.69**			Weighted C =	**0.74**			Weighted C =	**0.59**			Weighted C =	**0.31**

	Imp. RF	Pervious RF	% Imp	BASIN 7 BF-1-7 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 8 BF-1-8 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 9 BF-1-9 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 10 BF-1-10 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 11 BF-1-11 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 12 BF-1-12 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.15	0.02	0.21	0.00	0.21	0.02	0.36	0.00	0.36	0.04
MF	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (50% Imp)	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (60% imp)	0.90	0.10	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU-1/CF	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (80% imp)	0.90	0.10	80	1.09	0.87	0.22	0.81	1.64	1.31	0.33	1.21	5.20	4.16	1.04	3.85	2.30	1.84	0.46	1.70	0.83	0.66	0.17	0.61	0.00	0.00	0.00	0.00
ROAD (85%)	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.48	2.96	0.52	2.71
SCHOOL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	2.75	0.00	2.75	0.28	3.46	0.00	3.46	0.35	32.75	0.00	32.75	3.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.93	0.00	11.93	1.19
ESTATE	0.90	0.10	25	7.05	1.76	5.29	2.12	5.39	1.35	4.04	1.62	33.58	8.40	25.19	10.07	7.43	1.86	5.57	2.23	7.44	1.86	5.58	2.23	26.08	6.52	19.56	7.82
				10.89	2.63	8.26	3.20	**10.49**	2.66	7.83	3.18	**71.53**	12.56	58.98	17.20	**9.88**	3.70	6.18	3.95	**8.48**	2.52	5.96	2.87	**41.85**	9.48	32.37	11.77
						Weighted C =	**0.29**			Weighted C =	**0.30**			Weighted C =	**0.24**			Weighted C =	**0.40**			Weighted C =	**0.34**			Weighted C =	**0.28**

	Imp. RF	Pervious RF	% Imp	BASIN 13 BF-1-13 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BASIN 14 BF-1-14 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BMP 15 BF-3-1 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BMP 16 BF-3-2 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BMP 17 BF-3-3 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A	BMP 18 BF-3-4 (ac.)	Imp Area (ac.)	Pervious Area (ac.)	Summation RF x A
BASIN	0.90	0.10	0	1.05	0.00	1.05	0.11	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PUMP STATION	0.90	0.10	85	0.34	0.29	0.05	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (50% Imp)	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF (60% imp)	0.90	0.10	60	17.52	10.51	7.01	10.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	0	0.53	0.00	0.53	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU-1/CF	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (80% imp)	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.14	0.04	0.13
ROAD (85%)	0.90	0.10	85	3.22	2.74	0.48	2.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD (100%)	0.90	0.10	100	0.00	0.00	0.00	0.00	1.10	1.10	0.00	0.99	0.32	0.32	0.00	0.29	0.55	0.55	0.00	0.50	0.30	0.30	0.00	0.27	0.00	0.00	0.00	0.00
SCHOOL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	1.85	0.00	1.85	0.19	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.54	0.05	1.35	0.00	1.35	0.14	0.00	0.00	0.00	0.00
ESTATE	0.90	0.10	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.17	0.50	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				24.51	13.54	10.97	13.28	**1.14**	1.10	0.04	0.99	**0.99**	0.49	0.50	0.49	**1.09**	0.55	0.54	0.55	**1.65**	0.30	1.35	0.41	**0.18**	0.14	0.04	0.13
						Weighted C =	**0.54**			Weighted C =	**0.87**			Weighted C =	**0.49**			Weighted C =	**0.50**			Weighted C =	**0.25**			Weighted C =	**0.74**

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EXHIBIT 1C
DRAINAGE MANAGEMENT AREA MAP
Village 14 & Planning Areas 16/19
COUNTY OF SAN DIEGO, CALIFORNIA