APPENDIX 4.1-10

Land Exchange Alternative
Storm Water Management Plan

County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

OTAY RANCH VILLAGE 14 AND PLANNING 16/19- LAND EXCHANGE ALTERNATIVE
PDS2015-MPA-15004

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, 598-021-01, 598-011-01 (Por.), 597-130-13 (Por.), 597-140-01(Por.), 597-140-07 (Por.), 597-140-06 (Por.), 597-140-09 (Por.)

ENGINEER OF WORK:

Alisa S. Vialpando

Alisa S. Vialpando, Vice-President, RCE #47945

PREPARED FOR:

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PDP SWQMP PREPARED BY:

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

DATE OF SWQMP:
January 29, 2018

PLANS PREPARED BY:
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San Diego, CA 92121
(858) 558-4500

SWQMP APPROVED BY:

APPROVAL DATE:

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Table of Contents

Attachments

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 AREA 16/19-LAND EXCHANGE ALTERNATIVE
Permit Application Number: PDS2015-MPA-15004

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

January 29, 2018
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	10-26-2015	Initial Submittal
2	11-7-2017	Retitle project, convert to SWQMP template, address planchecks.
3	01-29-2018	Address planchecks (2nd screencheck)
4		

Final Design

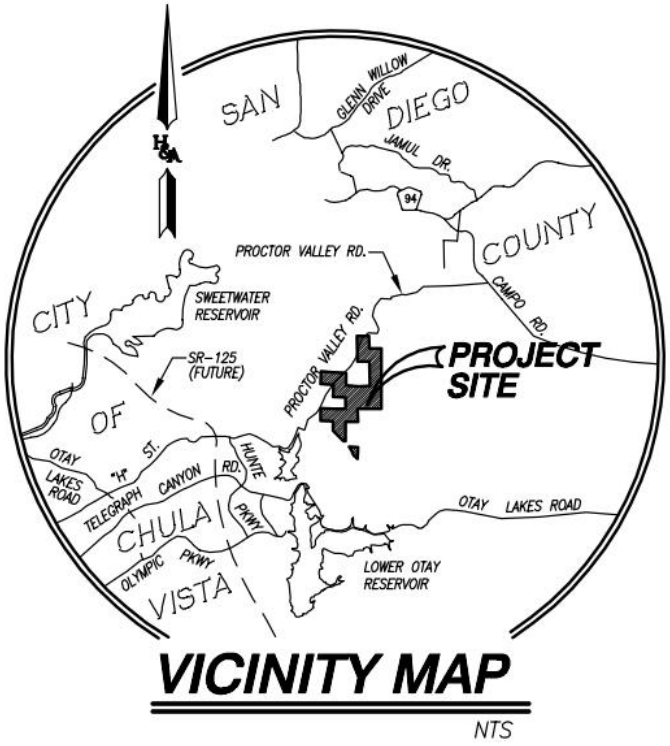
Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

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

Project Vicinity Map

Project Name: OTAY RANCH VILLAGE 14 AND PLANNING AREA 16/19-LAND EXCHANGE ALTERNATIVE
Record ID: PDS2015-MPA-15004



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: 14,613,073 ft^2			
The total existing (pre-project) impervious area is: 302,306 ft^2			
The total area disturbed by the project is: 25,575,043 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, construction design plan sheets have not been produced.
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, construction design plan sheets have not been produced.
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, construction design plan sheets have not been produced.
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, construction design plan sheets have not been produced.
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, construction design plan sheets have not been produced.
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, construction design plan sheets have not been produced.
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, construction design plan sheets have not been produced.
Solid Waste Management	WM-5	☒	
Sanitary Waste Management	WM-9	☒	
Hazardous Waste Management	WM-6	☒	

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.

[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.

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 Hydrologic Sub Area (910.32)

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:
Except for Proctor Valley Road and a few other minor unpaved roads, the site is vacant, undeveloped, natural land.

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

☒ Vegetative Cover 2,341 * 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 2,348 which includes 1,003 acres of Otay Ranch Proctor Valley 14 and 1,345 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):

☐ 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.

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 Land Exchange Alternative 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 underneath Proctor Valley Road.

All runoff from the Land Exchange Alternative site 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. Comingling of offsite flows with onsite flows will not occur until after onsite runoff has received water quality treatments of the 85th percentile runoff volume.

The project area is vast. An existing condition hydrologic analysis was prepared for the site and included within the Drainage Study for Otay Ranch Village 14 and Planning 16/19- Land Exchange Alternative. 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 incudes potions of the City of Jamul.

Project Description / Proposed Land Use and/or Activities:

The Land Exchange Alternative includes approximately 511 acres designated for 1,530 homes, 1,124 of which would be traditional single-family homes, 283 would be single family age-restricted and 123 would be multifamily homes as indicated on Table 1 below. 18 neighborhoods are planned with approximate densities ranging from 1.5 to 15.0 dwelling units per acre. The age-restricted neighborhoods would be gated, as would four of the single-family neighborhoods situated on the largest lots. Village 14 in the Land Exchange Alternative is planned around a Village Core, centrally located in the heart of the village. Higher density residential uses will be adjacent to the Village Core with single family residential radiating out in decreasing densities. The Village Core is comprised of the Neighborhood Center which includes an 8-acre elementary school; a 4-acre Village Green (public park); a 3-acre Mixed Use Site with up to 15,000 square feet of commercial/retail uses and 54 multi-family homes; and a 2-acre Village Square Community Facility. The Village Core also includes a 2-acre public safety site for a fire station and sheriff's storefront facility and 69 multi-family townhomes located adjacent to the public safety site. The Land Exchange Alternative is designed around an active lifestyle and wellness recreation theme and includes an extensive park and recreation system including four public parks totaling 13 acres as depicted on Figure 4. The remaining private recreation facilities include three private swim clubs, a senior activity center, the Village Square community facility and numerous pocket parks totaling approximately 9 acres. Approximately 4.6 miles of community pathway are proposed on the Proctor Valley Road. Approximately three miles of Park-to-Park Loop connect to the regional pathway. After implementing the proposed land exchange agreement, MSCP and RMP Preserve boundary adjustments, and General Plan Amendments, the Land Exchange Alternative Area will include 1,749 acres of land designated MSCP and Otay Ranch RMP Preserve, consisting of 404 acres in Proctor Valley Village 14, and 1,345 acres in Planning Areas 16 and 19.

Circulation and Access: Under the Land Exchange Alternative, regional access to Village 14 would be 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. SR 54, located approximately six miles to the northwest, connects to SR-125 and I-805, and provides regional east/west access. Proctor Valley Road would provide the main access to Village 14. Five roundabouts 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 residential collectors and residential streets to provide access to the residential neighborhoods. Proctor Valley Road is planned as a two-lane road and is designated as a scenic corridor. The Land Exchange Alternative includes an Otay Ranch GDP/SRP amendment to the classification of Proctor Valley Road from a 4 Lane Major to a 2 Lane Light Collector. The northern connection of Proctor Valley Village 14 to Jamul will be in the alignment of the existing partially-improved Proctor Valley Road and will be paved provide both public access and secondary emergency access to both communities. The Lane Exchange Alternative Circulation Plan incorporates vehicular and non-vehicular modes of transportation to create an integrated system of roads, bike lanes, trails, pathways, and sidewalks.

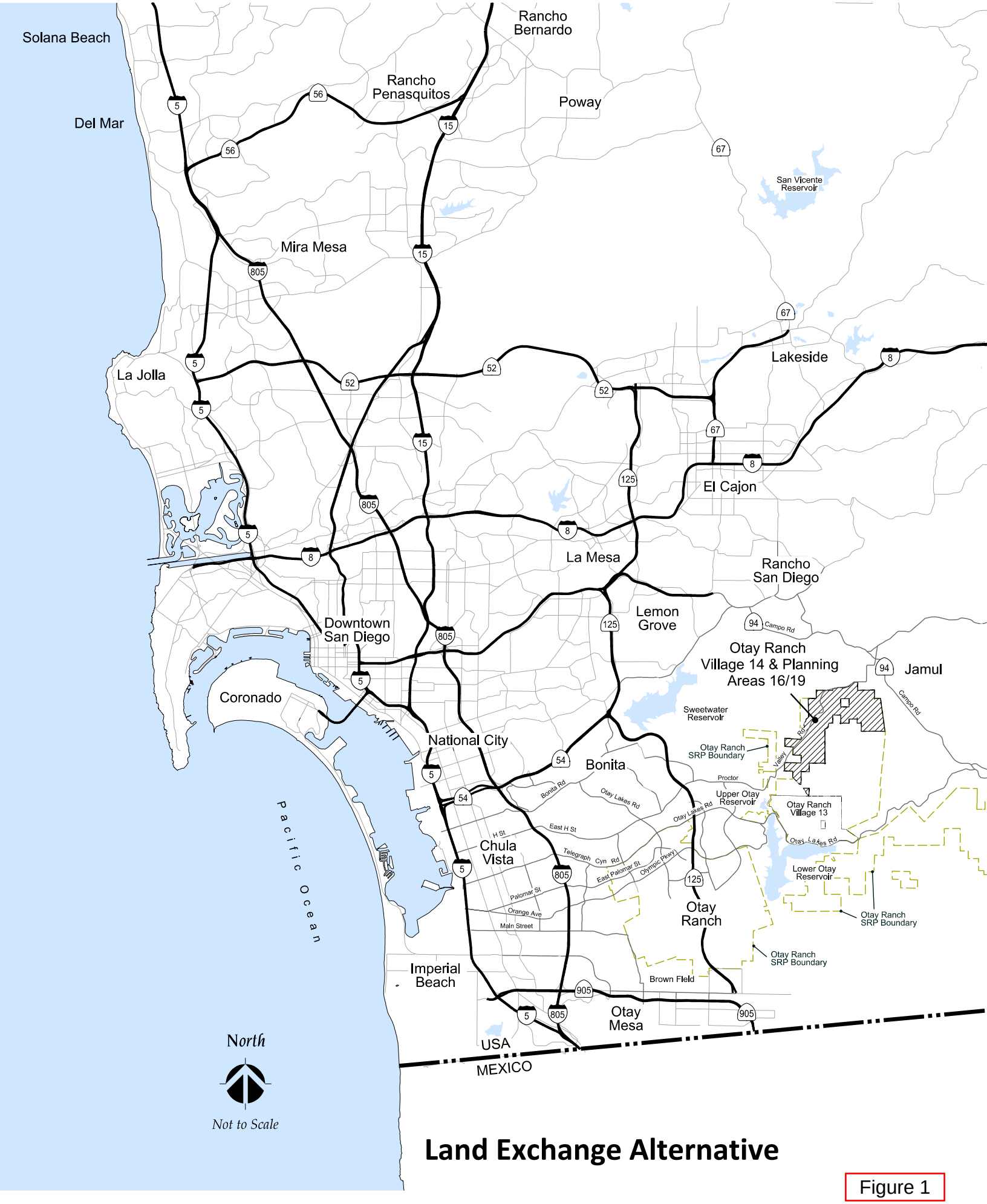
Options: The Land Exchange Alternative includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option and (3) the Perimeter Trail Option. The Draft EIR Land Exchange Alternative assesses each of these options and their respective impacts. Each 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 Proctor Valley Road Street Section 10 at the northerly edge of Village 14. Street Section 10 would be replaced with Street Section 10B to provide for two dedicated bike lanes (one on each side of the road) instead of the "sharrows" [1] proposed in the Land Exchange Alternative. Note that Street Section 10A provides a transition section at the northerly property boundary and does not change in the Option scenario. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 48 feet.

Preserve Trails Option: The Preserve Trails Option consists of two segments of existing, disturbed trails. 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 4,450 lineal feet, generally located at the northern terminus of Village 14 and extending northeast through the onsite Otay Ranch RMP Preserve to the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment "B"/"49" is approximately 3,100 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.

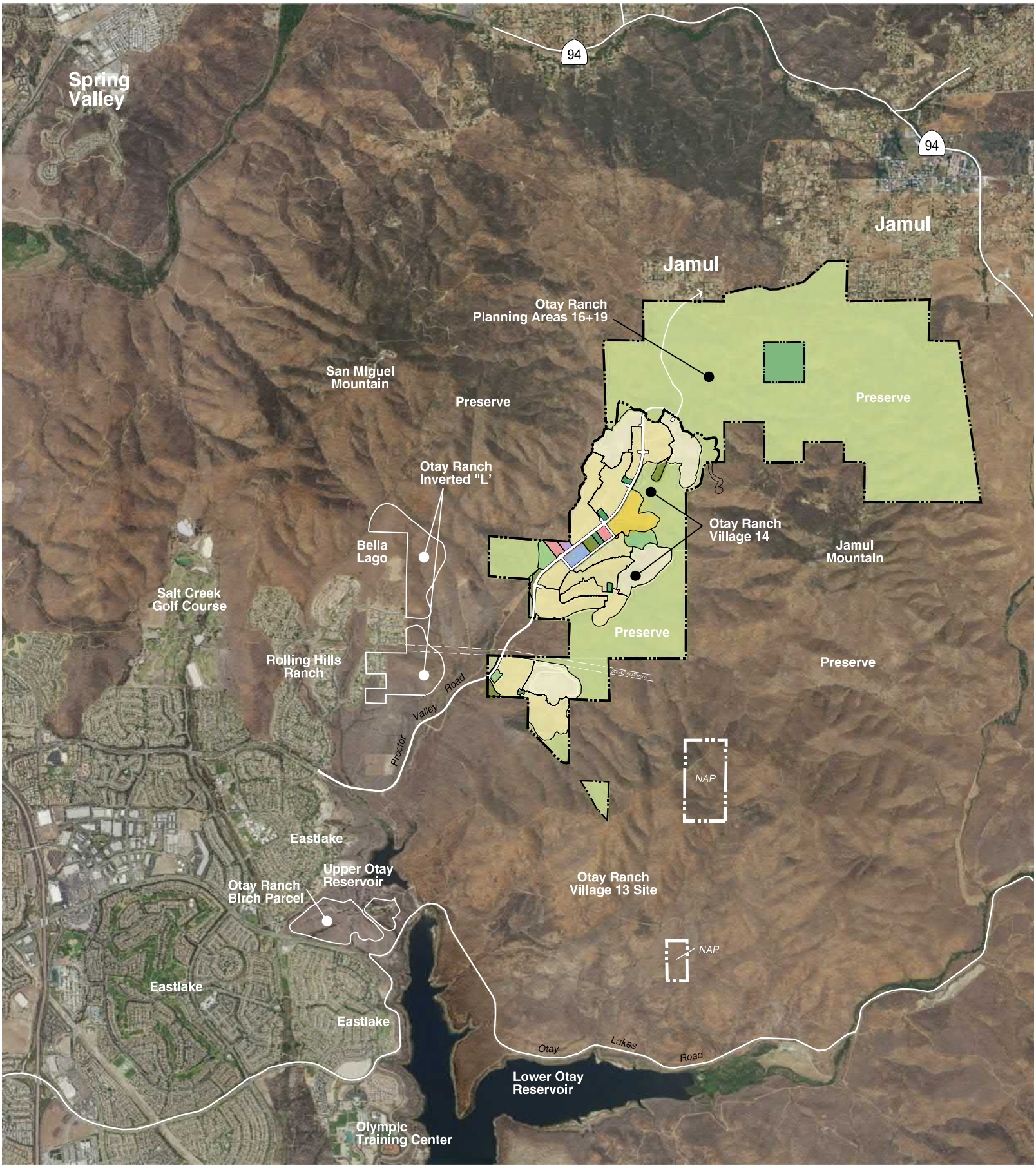
Perimeter Trail Option: The Perimeter Trail Option is an approximately 4.5-mile perimeter trail located within the Development Footprint of Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive 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 5,200 lineal feet (1.0 mile) 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 has evaluated these options and they are not material to the information in this report.



Land Exchange Alternative

Figure 1



North

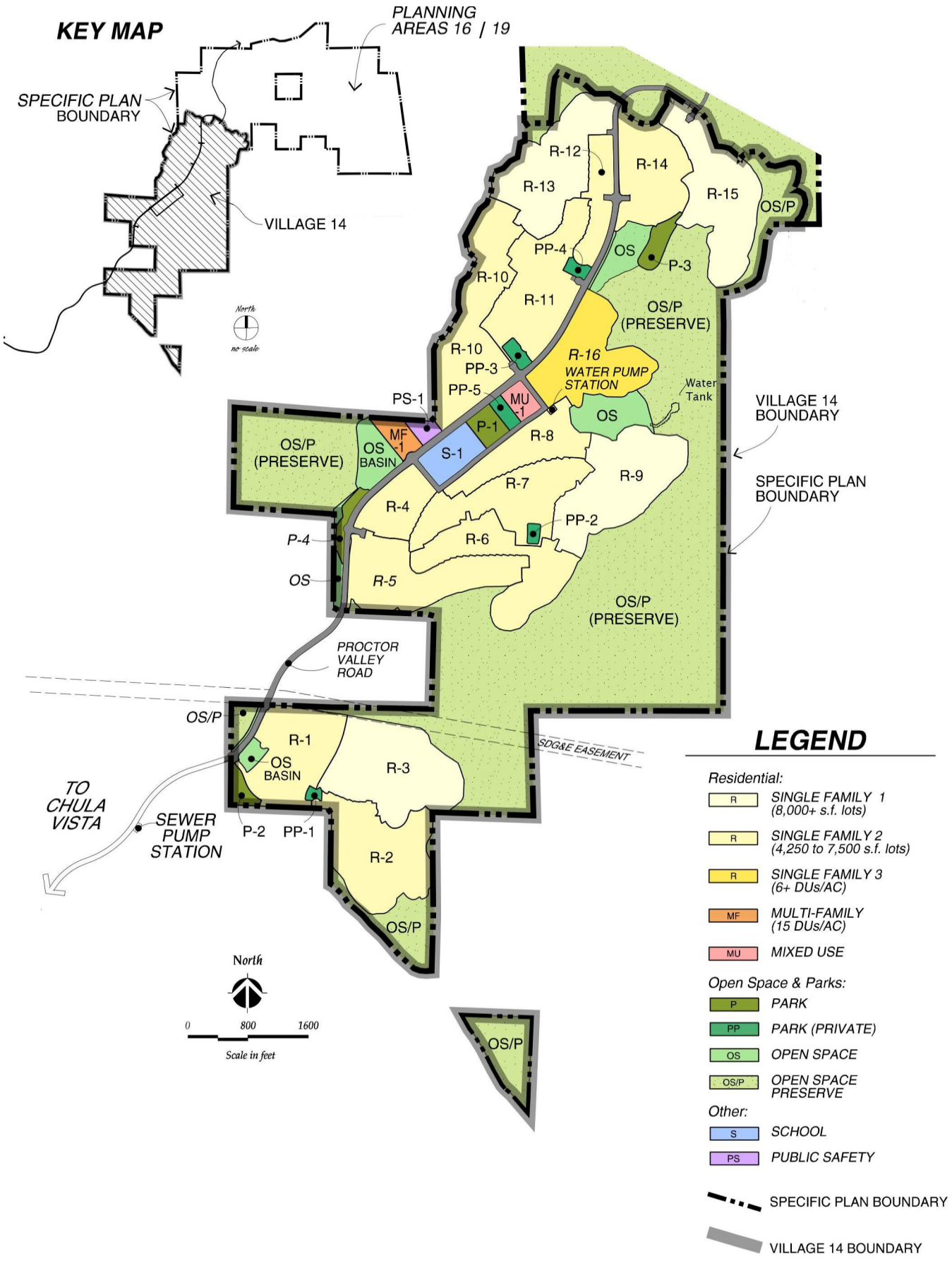
0 1200 2400

Scale in feet

Source: NAIP Color Imagery for US (1m Resolution)
Aerial Flown: May 201

Land Exchange Alternative

Figure 2



Land Exchange Alternative

Figure 3

Table 1

Otay Ranch Land Exchange Alternative

Site Utilization Plan - Land Use Summary

January 25, 2018

Proctor Valley Village 14		**Acres**	**Units**	**Density**
Residential Uses				
Single Family Residential				
R-1	SF-2	28.9	112	3.9
R-2	SF-2	37.1	72	1.9
R-3	SF-1	41.7	67	1.6
R-4	SF-2	14.3	57	4.0
R-5	SF-2	33.9	109	3.2
R-6	SF-2	30.6	75	2.4
R-7	SF-2	32.1	91	2.8
R-8	SF-2	20.1	47	2.3
R-9	SF-1	41.5	74	1.8
R-10	Age Restricted SF-1	42.5	127	3.0
R-11	Age Restricted SF-1	34.4	156	4.5
R-12	SF-2	12.3	44	3.6
R-13	SF-1	36.4	66	1.8
R-14	SF-2	26.9	60	2.2
R-15	SF-1	38.5	59	1.5
R-16	SF-3	31.7	191	6.0
Single Family Subtotal		503.1	1,407	2.8
Multi-Family & Mixed Use				
MF-1		4.6	69	15.2
MU-1 *(2)*		3.5	54	15.5
MF & Mixed Use Subtotal		8.0	123	15.3
Residential Subtotal *(3)*		**511.2**	**1,530**	**3.0**
Non-Residential Uses				
Public Parks				
P-1	Village Green	3.9		
P-2	Overlook Park	4.2		
P-3	South Park	2.9		
P-4	Scenic Park	2.5		
Public Parks Subtotal		**13.5**		
Private Parks				
PP-1	South	0.8		
PP-2	Central	1.0		
PP-3	Senior Activity Center	1.8		
PP-4	North	1.4		
PP-5	Village Core	1.9		
Private Parks/Recreation Subtotal		6.9		
Public Uses				
Public Safety		2.3		
Elementary School		8.3		
Public Uses Subtotal		10.6		
Open Space & Preserve				
Internal Open Space *(4)*		33.4		
Preserve		403.9		
Open Space & Preserve Subtotal		437.3		
Circulation Subtotal *(5)*		23.1		
Non-Residential Uses Subtotal		**491.4**		
Proctor Valley Village 14 Subtotal		**1,002.6**	**1,530**	**1.5**
Planning Area 16/19 Preserve				
Circulation in Preserve *(6)*		16.4		
Preserve		276.3		
Exchange to State for preserve		278.0		
Existing State Ownership (portion)		774.1		
Planning Area 16/19 Preserve Subtotal		**1,344.9**		
Proctor Valley Village and Preserve Grand Total		**2,347.3**	**1,530**	**0.7**

NOTES

(1) Additional offsites excluded from the acreage above include:

Proctor Valley Road Offsite Central & South	40.2
Offsite Sewer to Salt Creek Interceptor	

(2) Mixed Use acreage includes 15,000 sf of commerical use

(3) Residential acreage includes 153.2 acres of fuel mod and internal open space slopes and 2.6 acres of private pocket parks.

(4) Open Space included 11.3 acres of basins and HOA open space lots not included in the residential acreage.

(5) Proctor Valley Road Onsite in Village 14 only

(6) Proctor Valley Road north in Planning Area 16 is in Preserve.

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, 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, biofiltration areas, 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, slight internal diversions and topographic alterations will occur due to the proposed grading.

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	2,341 ac	2,006 ac	-14.27%
Pervious (non-vegetated)			0
Impervious	6.94 c	335 ac	14.98%

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 Land Exchange Alternative 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 Land Exchange Alternative. The higher elevation portions west of the eastern watershed ridge line are not proposed for development.

All runoff from the Land Exchange Alternative 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 wish flow reductions to the Upper Otay Reservoir. The analysis determined that the peak flow increased from 12,036 cfs to 12,372 cfs. Please refer to the Drainage Study for Proctor Valley Village 14 and Preserve for associated drainage calculations relative to the proposed development. Below is a summary table of flows.

Condition	**Tributary Area (acres)**	**100-Year Peak Flow (cfs)**
Pre-Developed	6,880.65	12,036
Post-Developed	6,880.65	12,372
DIFFERENCE	**0**	**+336**

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:
Multi-Use facilities and schools are planned to be constructed within the Land Exchange Alternative. 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 Land Exchange Alternative project site is located immediately adjacent to Proctor Valley which directly discharges into the Upper Otay Reservoir. The onsite storm drain which conveys developed flows will be routed through biofiltration facilities prior to discharging into Proctor Valley. 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 the 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	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐

[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

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 Land Exchange Alternative project was subdivided into eight (8) areas with each draining to their respective Point of Compliance (POC). See Attachment 2b within the HMP-Flow Control Report for HMP-related maps. Following are brief descriptions of each Point of Compliance.

POC1 is the northernmost POC and encompasses 591.62 acres of native undeveloped area in existing condition. The western boundary of this project subwatershed is generally the existing Proctor Valley Road. In proposed condition, the drainage area to this POC consists of developed area and undisturbed or pervious area which will not need to be treated or routed through the proposed water quality basin for this POC. The developed portions of this POC include single- family, multi-family, multi-use, parks, a school site, a firehouse, open space, and community facilities. The peak developed flows will be routed through Basin #1 for water quality treatment and flow control. The designed riser outlet structure will include flow control discharge orifices and be sized to accommodate peak flows.

POC2 is located south of POC1 and is related to the location of Basin #2. The existing condition tributary area to POC2 consist of about 432.14 acres of undisturbed native pervious land east of the existing Proctor Valley Road. Similar to POC, the area to POC2 in developed condition will include both developed areas as well as undeveloped/unimproved areas. The peak developed flows which are directed into Basin #2 for water quality treatment and flow control will outlet the basin via the designed riser outlet structure which will include flow control discharge orifices and be sized to accommodate peak flows.

The POC3 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed Basin #3. The HMP analysis for POC3 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The 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.

The POC4 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed Basin #4. The HMP analysis for POC4 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The roadside biofiltration area (Basin #4) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. This POC also includes some pervious natural areas which will bypass the basin since it does not require any WQ treatment.

POC5 is the southernmost POC and final HMP analysis required for the Proctor Valley Village Project. The POC5 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed Basin #5. The HMP analysis for POC5 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The roadside biofiltration area (Basin #5) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. The analysis at this POC also includes some existing undeveloped areas located north of Proctor Valley Road and east of the Neighborhood 9 portion of Rolling Hills Ranch which is located upstream of POC5. Although developed portions of Rolling Hills Ranch itself are tributary to POC5, they were not included in either the existing or proposed condition (SWMM) models. This approach is conservative or would have a negligible positive impact on the overall results since it would equally impact both simulation models.

The POCs 6 and 7 existing and proposed condition subwatersheds were delineated for areas tributary to the point of discharge from the respective proposed Basins 6 and 7. The HMP analysis for these POCs were prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road north. The roadside biofiltration areas (Basins 6 and 7) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. HMP storage for POC6 will be accomplished by Basin 6 and by the area east of Proctor Valley Road upstream of the proposed proprietary biofiltration units (MWS#1&2). A riser box with orifices will be set at this location for flow control prior to discharging downstream at POC6. HMP storage for POC7 will be accomplished by Basin 7 and a vault place in the vicinity of the proposed proprietary biofiltration units (MWS#3&4).

The POC8 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed Basin #8 and #9. The HMP analysis for POC8 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The roadside biofiltration areas (Basins #8 and #9) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road.

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

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

Discussion / Additional Information: (optional)

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.

Many of the developed portions of the site are located at the lower elevations of the overall development. Large offsite areas which will not be developed will drain towards the 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 contains 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, or vehicle cleaning, maintenance shops, or fuel dispensing areas.			

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:			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.6 not implemented:			
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. Flow decreases to this reservoir are not encouraged as the reservoir and the downstream Lower Otay Reservoir have capacity for unattenuated peak 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 nine biofiltration basins at the downstream portions of the developed areas and along Proctor Valley Road which will act to address both pollution control and flow control measures. In addition, four proprietary biofiltration units and one (HMP) storage vault 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. The DMAs are not self-retaining, self-mitigating, or De minimis.
2. Estimated DCV.
3. Determined that there was not a demand for rainwater harvesting within the development.
4. Determined that infiltration is not feasible and the proposed basins are located within areas consisting of type D hydrologic soils.
5. Computed sizing requirements.
6. Design BMP for DCV per design criteria and considerations listed in the fact sheets.

The nine onsite biofiltration basins have designated as BF-1-1 through BF-1-9. The prefix, BF-1, designates that the particular treatment facility is biofiltration (BF-1) as shown within the County's BMP Design Manual. Four proprietary biofiltration modular units (BF-3) are proposed along the northern portion of Proctor Valley Road in instances where a basin would be infeasible to be placed. 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 nine biofiltration treatment basins will also be sized to aid in addressing flow control hydromodification for their respective local POC areas.

The following summarizes the proposed treatment Village 14 BMP facilities:

- **Nine roadside biofiltration areas and 4 proprietary modular biofiltration units along Proctor Valley Road South and North**

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.)

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

(Continued from previous page)

The two major biofiltration water quality basins are proposed to receive runoff from the majority of areas with proposed development. Infiltration rates at each basin location vary and will determine the feasibility of infiltration. See Attachment 1b for breakdown of feasibility at each basin location. Each basin is designed to receive at least the 85th percentile storm. In some instances, the 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 otherwise a vector plan will be required. 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 biofiltration water quality facilities along with the proposed site design and source control BMPs will prevent the larger sources of nutrients (such as leaves) from entering the Upper Otay Reservoir. 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 Land Exchange Alternative 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.

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-1-9	
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 ljackson@jacksonpendo.com
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

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 (CDS Units or equivialent)

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 (BioClean MWS or equivalent)	
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. HMP1 (Vault for MWS #3 & 4) and HMP2 (Riser for MWS #1 & 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)*	

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: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	649,811	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
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	No	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	No	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	7,350	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	30,522	cubic-feet
	13	Total Anticipated Use Over 36 Hours	37,872	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.06	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	Yes	yes/no
Result	18	Feasibility Category	4	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

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

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

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

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

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

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

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

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

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-1-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9		unitless
	1	Basin Drains to the Following BMP Type	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		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		in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	10,484,877	3,623,756	148,104	89,298	168,142	37,026	36,155	4,690	4,690		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)	411,641	2,164,496	53,579	58,806	121,097	19,166	14,375	5,025	2,345		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)	5,911,093	352,836									sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	Yes	Yes	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	50	100									#
	20	Average Mature Tree Canopy Diameter	15	15									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	16,807,611	6,141,088	201,683	148,104	289,239	56,192	50,530	9,715	7,035	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.67	0.58	0.69	0.58	0.57	0.63	0.67	0.49	0.63	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	0.67	0.58	0.69	0.58	0.57	0.63	0.67	0.49	0.63	0.00	unitless
	32	Initial Design Capture Volume	487,981	154,346	6,030	3,722	7,144	1,534	1,467	206	192	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	0.67	0.58	0.69	0.58	0.57	0.63	0.67	0.49	0.63	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	487,981	154,346	6,030	3,722	7,144	1,534	1,467	206	192	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	5,000	10,000	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	0.66	0.54	0.69	0.58	0.57	0.63	0.67	0.49	0.63	0.00	unitless
	42	Final Effective Tributary Area	11,093,023	3,316,188	139,161	85,900	164,866	35,401	33,855	4,760	4,432	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	5,000	10,000	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	482,981	144,346	6,030	3,722	7,144	1,534	1,467	206	192	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-1-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9	-	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	-	in/hr
	2	Effective Tributary Area	11,093,023	3,316,188	139,161	85,900	164,866	35,401	33,855	4,760	4,432	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.011	0.012	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	ratio
	4	Design Capture Volume Tributary to BMP	482,981	144,346	6,030	3,722	7,144	1,534	1,467	206	192	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Unlined	Unlined	Unlined	Unlined	Unlined	Lined	Lined	Lined	Lined		unitless
	6	Provided Biofiltration BMP Surface Area	160,200	49,200	4,231	3,379	5,192	2,700	2,300	160	160		sq-ft
	7	Provided Surface Ponding Depth	12	12	6	6	6	6	6	6	6		inches
	8	Provided Soil Media Thickness	36	18	18	18	18	18	18	18	18		inches
	9	Provided Depth of Gravel Above Underdrain Invert	12	36	12	12	12	12	24	24	24		inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	5.10	3.50	0.80	0.70	0.80	0.60	0.50	0.15	0.15		inches
	11	Provided Depth of Gravel Below the Underdrain	3	3	3	3	3	3	3	3	3		inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	8,010	2,460	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	3.00	2.10	2.10	2.10	2.10	0.90	0.90	0.90	0.90	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	18	18	18	18	30	120	120	120	120	0	hours
	17	Volume Retained by BMP	48,060	11,070	952	760	1,038	203	173	12	12	0	cubic-feet
	18	Fraction of DCV Retained	0.10	0.08	0.16	0.20	0.15	0.13	0.12	0.06	0.06	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.27	0.22	0.39	0.48	0.29	0.15	0.14	0.07	0.07	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.15	0.11	0.24	0.30	0.16	0.07	0.07	0.03	0.03	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	410,534	128,468	4,583	2,605	6,001	1,427	1,364	200	186	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	1.4946	0.7444	0.0289	0.0222	0.0289	0.0163	0.0131	0.0012	0.0012	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.40	0.65	0.30	0.28	0.24	0.26	0.25	0.32	0.32	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	0.40	0.65	0.30	0.28	0.24	0.26	0.25	0.32	0.32	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	2.42	3.92	1.77	1.70	1.45	1.57	1.48	1.91	1.91	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	24.00	30.00	14.40	14.40	14.40	14.40	19.20	19.20	19.20	0.00	inches
	29	Drawdown Time for Surface Ponding	24	16	15	16	21	23	24	19	19	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	48	40	36	38	50	55	78	60	60	0	hours
	31	Total Depth Biofiltered	26.42	33.92	16.17	16.10	15.85	15.97	20.68	21.11	21.11	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	615,801	192,702	6,875	3,908	9,002	2,141	2,046	300	279	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	352,683	139,079	5,703	3,908	6,856	2,141	2,046	282	279	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	307,901	96,351	3,437	1,954	4,501	1,070	1,023	150	140	0	cubic-feet
	35	Option 2 - Provided Storage Volume	307,901	96,351	3,437	1,954	4,501	1,070	1,023	150	140	0	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	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	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	0.00	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	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-1-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9	-	unitless
	1	Drains to following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	unitless
	2	Final Effective Tributary Area	11,093,023	3,316,188	139,161	85,900	164,866	35,401	33,855	4,760	4,432	-	sq-ft
Biofiltration Clogging Inputs	3	Is Proposed Biofiltration BMP <3% of Effective Tributary Area Desired?	Yes	Yes	No	No	No	No	No	No	No	No	yes/no
	4	Average Annual Precipitation	11.0	11.0									inches
	5	Load to Clog (default =2.0)	3.0	3.0									lb/sq-ft
	6	Allowable Period to Accumulate Clogging Load (default =10)	10	9									years
	7	Pretreatment Measures Included?	Yes	Yes									yes/no
	8	Commercial: TSS=128 mg/L, C= 0.80	230,213										sq-ft
	9	Education: TSS=132 mg/L, C= 0.50	257,159										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	4,725,389	978,414									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	4,725,388	978,414									sq-ft
	15	Transportation: TSS=78 mg/L, C= 0.90											sq-ft
	16	Vacant/Open Space: TSS=216 mg/L, C= 0.10	1,154,874	1,359,360									sq-ft
Minimum Footprint Calculations	17	Effective-Area Based on Specified Land Use Coefficients	5,153,626	1,114,350	0	0	0	0	0	0	0	0	sq-ft
	18	Average TSS Concentration for Tributary	80	91	0	0	0	0	0	0	0	0	mg/L
	19	Average Annual Runoff	10,168,604	3,039,839	0	0	0	0	0	0	0	0	cubic-feet
	20	Average Annual TSS Load	50,784	17,269	0	0	0	0	0	0	0	0	lb/yr
	21	Average Annual TSS Load After Pretreatment Measures	38,088	12,952	0	0	0	0	0	0	0	0	lb/yr
	22	Minimum Allowable Biofiltration Footprint Ratio	0.011	0.012	0.030	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.

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-1-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9	-	unitless
	1	85th Percentile Storm Depth	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	-	in/hr
	3	Total Tributary Area	16,807,611	6,141,088	201,683	148,104	289,239	56,192	50,530	9,715	7,035	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	728,330	266,114	8,740	6,418	12,534	2,435	2,190	421	305	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.67	0.58	0.69	0.58	0.57	0.63	0.67	0.49	0.63	-	unitless
	6	Initial Design Capture Volume	487,981	154,346	6,030	3,722	7,144	1,534	1,467	206	192	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	0	0	0	0	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	5,000	10,000	0	0	0	0	0	0	0	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	11,093,023	3,316,188	139,161	85,900	164,866	35,401	33,855	4,760	4,432	-	square feet
	10	Final Design Capture Volume Tributary to BMP	482,981	144,346	6,030	3,722	7,144	1,534	1,467	206	192	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	72,447	15,878	1,447	1,117	1,143	107	103	6	6	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.16	0.17	0.24	0.30	0.16	0.07	0.07	0.03	0.03	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	22.6%	23.8%	31.4%	37.3%	22.6%	10.7%	10.7%	4.6%	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%	-	%
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%	-	%
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	-	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	-	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

VILLAGE 14 PLANNING AREAS 16/19

BIOFILTRATION BMP DMA CALCULATIONS- PROPRIETARY UNITS

	Imp. RF	Pervious RF	% Imp	MWS 1 BF-3-1	Imp Area	Pervious Area	Summation RF x A	MWS 2 BF-3-2	Imp Area	Pervious Area	Summation RF x A	MWS 3 BF-3-3	Imp Area	Pervious Area	Summation RF x A	MWS 4 BF-3-4	Imp Area	Pervious Area	Summation RF x A
				(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)		(ac.)	(ac.)	(ac.)	
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	0.00	0.00	0.00	0.00
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
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
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
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
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
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
ROAD (90%)	0.90	0.10	90	0.36	0.32	0.04	0.30	0.36	0.32	0.04	0.30	0.31	0.28	0.03	0.25	0.31	0.28	0.03	0.25
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
PARKWAY	0.90	0.10	0	0.16	0.00	0.16	0.02	0.15	0.00	0.15	0.02	0.15	0.00	0.15	0.02	0.15	0.00	0.15	0.02
ESTATE	0.90	0.10	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				0.52	0.32	0.20	0.31	0.51	0.32	0.19	0.31	0.46	0.28	0.18	0.27	0.46	0.28	0.18	0.27
				Weighted C =			0.60	Weighted C =			0.61	Weighted C =			0.59	Weighted C =			0.59

VILLAGE 14 AND PA 16/19
DCV CALCULATION- PROPRIETARY UNITS

BF-3-1: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.52	inches
2	Area tributary to BMP (s)	A=	0.52	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.60	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	587	cubic-feet

BF-3-2: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.52	inches
2	Area tributary to BMP (s)	A=	0.51	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.61	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	586	cubic-feet

BF-3-3: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.52	inches
2	Area tributary to BMP (s)	A=	0.46	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.59	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	508	cubic-feet

BF-3-4: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.52	inches
2	Area tributary to BMP (s)	A=	0.46	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.59	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	508	cubic-feet

BF-3-1 & BF-3-2 (MWS #1 & MWS #2)

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

Flow-thru Design Flows		Worksheet B.6-1		
1	DCV	DCV	587	cubic-feet
2	DCV retained	$DCV_{retained}$	0	cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$	0	cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow\text{-}thru}$	587	cubic-feet
5	Adjustment factor (Line 4 / Line 1)*	AF=	1.0	unitless
6	Design rainfall intensity	i=	0.20	in/hr
7	Area tributary to BMP (s)	A=	0.52	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.61	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.063	cfs

1) Adjustment factor shall be estimated considering only retention and biofiltration BMPs located upstream of flow-thru BMPs. That is, if the flow-thru BMP is upstream of the project's retention and biofiltration BMPs then the flow-thru BMP shall be sized using an adjustment factor of 1.
2) Volume based (e.g., dry extended detention basin) flow-thru treatment control BMPs shall be sized to the volume in Line 4 and flow based (e.g., vegetated swales) shall be sized to flow rate in Line 9. Sand filter and media filter can be designed either by volume in Line 4 or flow rate in Line 9.
3) Proprietary BMPs, if used, shall provide certified treatment capacity equal to or greater than the calculated flow rate in Line 9; certified treatment capacity per unit shall be consistent with third party certifications.

$Q_{TREAT} = Q \times 1.5 = 0.063 \times 1.5$
$= 0.095$ cfs

USE MODEL MWS L-4-8
(Capacity = 0.116 cfs)
@ EACH INLET

BF-3-3 & BF-3-3 (MWS #3 & MWS#4)

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

Flow-thru Design Flows		Worksheet B.6-1		
1	DCV	DCV	508	cubic-feet
2	DCV retained	$DCV_{retained}$	0	cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$	0	cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow\text{-}thru}$	508	cubic-feet
5	Adjustment factor (Line 4 / Line 1)*	AF=	1.0	unitless
6	Design rainfall intensity	i=	0.20	in/hr
7	Area tributary to BMP (s)	A=	0.46	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.59	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.054	cfs

1) Adjustment factor shall be estimated considering only retention and biofiltration BMPs located upstream of flow-thru BMPs. That is, if the flow-thru BMP is upstream of the project's retention and biofiltration BMPs then the flow-thru BMP shall be sized using an adjustment factor of 1.
2) Volume based (e.g., dry extended detention basin) flow-thru treatment control BMPs shall be sized to the volume in Line 4 and flow based (e.g., vegetated swales) shall be sized to flow rate in Line 9. Sand filter and media filter can be designed either by volume in Line 4 or flow rate in Line 9.
3) Proprietary BMPs, if used, shall provide certified treatment capacity equal to or greater than the calculated flow rate in Line 9; certified treatment capacity per unit shall be consistent with third party certifications.

$Q_{TREAT} = Q \times 1.5$
$= 0.054 \times 1.5 = 0.081$ cfs

USE MODEL MWS L-4-8
(capacity = 0.116 cfs)
@ EACH INLET

MWS Linear 2.0 HGL Sizing Calculations

MWS MODEL SIZE	WETLAND PERMITTER LENGTH	LOADING RATE GPM/SF	HGL HEIGHT																												
			SHALLOW MODELS																			STANDARD HEIGHT MODEL	HIGH CAPACITY MODELS								
			1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.65	3.70	3.75	3.80	3.85	3.90	3.95
MWS-L-4-4	6.50	1.0000	0.020	0.022	0.023	0.025	0.026	0.028	0.029	0.030	0.032	0.033	0.035	0.036	0.038	0.039	0.041	0.042	0.043	0.045	0.046	0.048	0.049	0.052	0.054	0.054	0.055	0.056	0.057	0.057	0.058	0.059
MWS-L-3-6	10.06	1.0000	0.031	0.034	0.036	0.038	0.040	0.043	0.045	0.047	0.049	0.052	0.054	0.056	0.058	0.061	0.063	0.065	0.067	0.069	0.072	0.074	0.076	0.078	0.081	0.082	0.085	0.087	0.088	0.089	0.090	0.091
MWS-L-4-8	14.80	1.0334	0.048	0.051	0.055	0.058	0.061	0.065	0.068	0.072	0.075	0.078	0.082	0.085	0.089	0.092	0.095	0.099	0.102	0.106	0.109	0.112	0.116	0.119	0.123	0.124	0.126	0.127	0.129	0.131	0.132	0.134
MWS-L-4-13	18.40	1.0310	0.059	0.063	0.068	0.072	0.076	0.080	0.085	0.089	0.093	0.097	0.101	0.106	0.110	0.114	0.118	0.123	0.127	0.131	0.135	0.139	0.144	0.148	0.152	0.154	0.156	0.158	0.160	0.163	0.165	0.167
MWS-L-4-15	22.40	1.0307	0.072	0.077	0.082	0.087	0.093	0.098	0.103	0.108	0.113	0.118	0.123	0.129	0.134	0.139	0.144	0.149	0.154	0.159	0.165	0.170	0.175	0.180	0.185	0.188	0.190	0.193	0.195	0.198	0.200	0.203
MWS-L-4-17	26.40	1.0305	0.085	0.091	0.097	0.103	0.109	0.115	0.121	0.127	0.133	0.139	0.145	0.152	0.158	0.164	0.170	0.176	0.182	0.188	0.194	0.200	0.206	0.212	0.218	0.221	0.224	0.227	0.230	0.233	0.236	0.239
MWS-L-4-19	30.40	1.0255	0.097	0.104	0.111	0.118	0.125	0.132	0.139	0.146	0.153	0.160	0.167	0.174	0.181	0.188	0.194	0.201	0.208	0.215	0.222	0.229	0.236	0.243	0.250	0.254	0.258	0.262	0.265	0.269	0.272	0.276
MWS-L-4-21	34.40	1.0260	0.110	0.118	0.126	0.134	0.142	0.149	0.157	0.165	0.173	0.181	0.189	0.197	0.204	0.212	0.220	0.228	0.236	0.244	0.252	0.260	0.267	0.275	0.283	0.287	0.292	0.296	0.300	0.304	0.308	0.312
MWS-L-8-12	44.40	1.0300	0.143	0.153	0.163	0.173	0.183	0.194	0.204	0.214	0.224	0.234	0.245	0.255	0.265	0.275	0.285	0.296	0.306	0.316	0.326	0.336	0.346	0.357	0.367	0.372	0.377	0.382	0.387	0.392	0.397	0.402
MWS-L-8-16	59.20	1.0300	0.190	0.204	0.217	0.231	0.245	0.258	0.272	0.285	0.299	0.312	0.326	0.340	0.353	0.367	0.380	0.394	0.408	0.421	0.435	0.448	0.462	0.476	0.489	0.496	0.503	0.509	0.516	0.523	0.530	0.537

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

THE FOLLOWING INFEASIBILITY FORMS WERE PREPARED FOR THE OTAY RANCH VILLAGE 14 AND PLANNING AREAS 16/19 TM (SRP PLAN). HOWEVER, BASIN LOCATIONS ON THIS PLAN ARE CONSISTENT WITH MANY OF THE SRP PLAN.

BASINS 1-5 ARE EXACT IN BOTH PLANS.

THE GEOLOGY/LOCATIONS FOR BASINS 6, 7, 8, AND 9 OF THIS PLAN COINCIDE WITH THE SRP PLAN BASINS 9, 12, 6, AND 6, RESPECTIVELY.

Categorization of Infiltration Feasibility Condition	Form I-8 BASINS 6, 7, 8,& 9

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 1- 4

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 BASIN 5

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

LAND EXCHANGE	SRP BASIN	Inf. Rate in/hr
1	1	0.10
2	2	0.10
3	3	0.10
4	4	0.10
5	5	0.05
8&9	6	0
	7	0
	8	0
6	9	0
	10	0
	11	0
7	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.

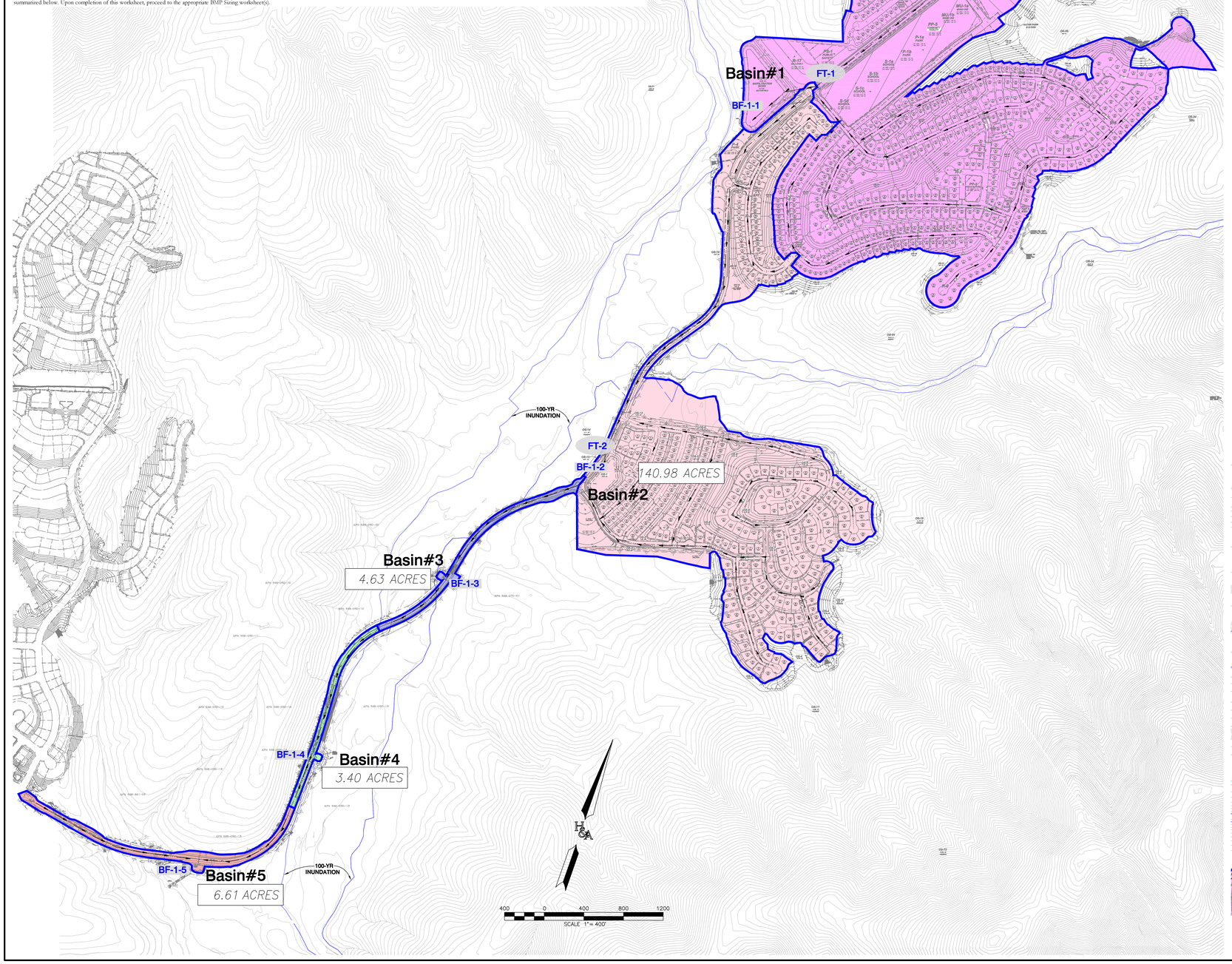
ATTACHMENT 1c
DMA EXHIBIT

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

	0	Drainage Basin ID or Name	BF-1-1	BF-1-2	BF-1-3	BF-1-4	BF-1-5	BF-1-6	BF-1-7	BF-1-8	BF-1-9		unitless
	1	Basin Drains to the Following BMP Type	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		inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.100	0.100	0.100	0.100	0.080	0.000	0.000	0.000	0.000		in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	10,484,877	3,623,756	148,104	89,298	168,142	37,026	36,155	4,690	4,690		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)	411,641	2,164,496	53,579	58,806	121,097	19,166	14,375	5,025	2,345		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)	5,911,093	352,836									sq-ft
	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	Yes	Yes	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (C=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (C=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (C=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (C=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (C=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (C=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (C=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A	50	100									#
	20	Average Mature Tree Canopy Diameter	15	15									ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
	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 (C=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
	28	Total Tributary Area	16,807,611	6,141,088	201,683	148,104	289,239	56,192	50,530	9,715	7,035	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.67	0.58	0.69	0.58	0.57	0.63	0.67	0.49	0.63	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	0.67	0.58	0.69	0.58	0.57	0.63	0.67	0.49	0.63	0.00	unitless
	32	Initial Design Capture Volume	487,981	154,346	6,030	3,722	7,144	1,534	1,467	206	192	0	cubic-feet
	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	0.67	0.58	0.69	0.58	0.57	0.63	0.67	0.49	0.63	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	487,981	154,346	6,030	3,722	7,144	1,534	1,467	206	192	0	cubic-feet
	39	Total Tree Well Volume Reduction	5,000	10,000	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
	41	Final Adjusted Runoff Factor	0.66	0.54	0.69	0.58	0.57	0.63	0.67	0.49	0.63	0.00	unitless
	42	Final Effective Tributary Area	11,093,023	3,316,188	139,161	85,900	164,866	35,401	33,855	4,760	4,432	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	5,000	10,000	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	482,981	144,346	6,030	3,722	7,144	1,534	1,467	206	192	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).



LEGEND:

- # — POINT OF COMPLIANCE
- # ACRES — DRAINAGE AREA
- SUBAREA BOUNDARY

- AREA TRIBUTARY TO BASIN #1
- AREA TRIBUTARY TO BASIN #2
- AREA TRIBUTARY TO BASIN #3
- AREA TRIBUTARY TO BASIN #4
- AREA TRIBUTARY TO BASIN #5
- AREA TRIBUTARY TO BASIN #6
- AREA TRIBUTARY TO BASIN #7
- AREA TRIBUTARY TO BASINS #8 /9
- AREA TRIBUTARY TO MWS 1 & 2
- AREA TRIBUTARY TO MWS 3 & 4

UNHATCHED GRADED SLOPES ARE CONSIDERED TO BE SELF-MITIGATING AREAS AND WILL NOT BE ROUTED THROUGH A TREATMENT CONTROL BMP.

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
- C. INTERIOR PARKING GARAGES
- D. NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- E. LANDSCAPE/OUTDOOR PESTICIDE USE
- F. POOLS, SPAS, PONDS, FOUNTAINS, AND OTHER WATER FEATURES
- G. FOOD SERVICE
- H. REFUSE AREAS
- J. OUTDOOR STORAGE OF EQUIPMENT OR MATERIALS
- 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

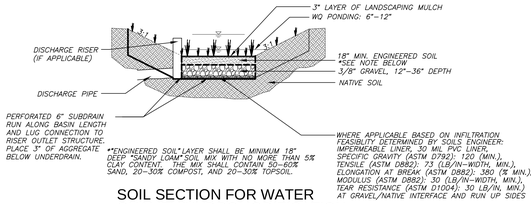
BF-1-X BIOFILTRATION BASINS — BF-1-X

BF-3-X PROPRIETARY BIOFILTRATION — BF-3-X

FT-X PRE-TREATMENT UNITS — FT-X

HMP-X HMP FLOW CONTROL STRUCTURE — HMP-X

UNDERLYING SOIL GROUP: D
APPROXIMATE DEPTH TO GROUND WATER: 10 FEET < GW DEPTH < 20 FEET



SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE — BASINS 1-9

PREPARED BY:

HUNSAKER & ASSOCIATES SAN DIEGO, INC
PLANNING ENGINEERING SURVEYING
5707 Waples Street San Diego, Ca 92121 PH(858)558-4500 FX(858)558-1414

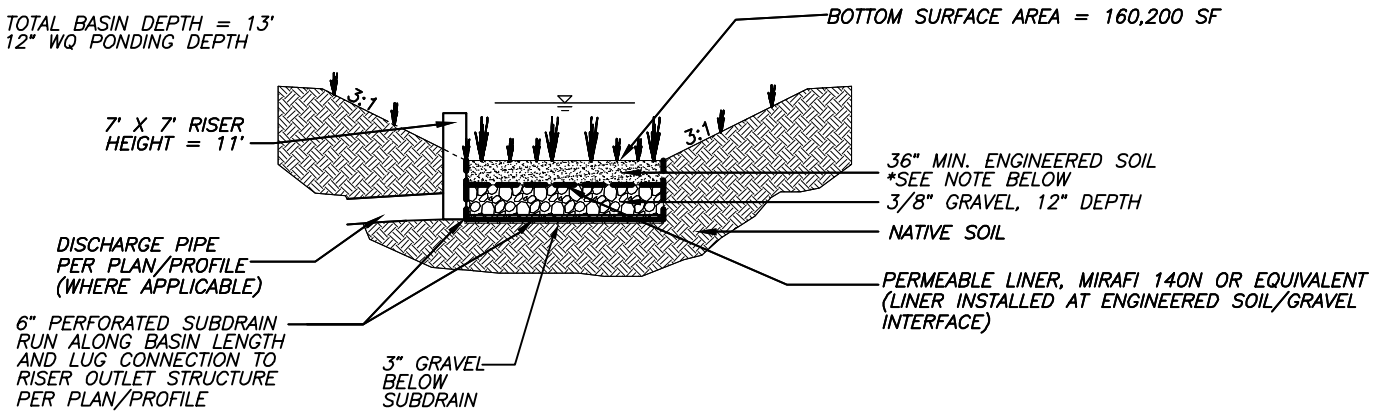
EXHIBIT C
DRAINAGE MANAGEMENT AREA MAP
LAND EXCHANGE ALTERNATIVE
COUNTY OF SAN DIEGO, CALIFORNIA

W.O. # 2421-31

R:\12351\Hyd\ACAD\SMMP\TM- Land Exchange FIR\12351- OTAY 14- DMA.dwg Jan-29-2018 15:23

ATTACHMENT 1d
INDIVIDUAL STRUCTURAL BMP DMA
MAPBOOK

Basin#1(BF-1-1)



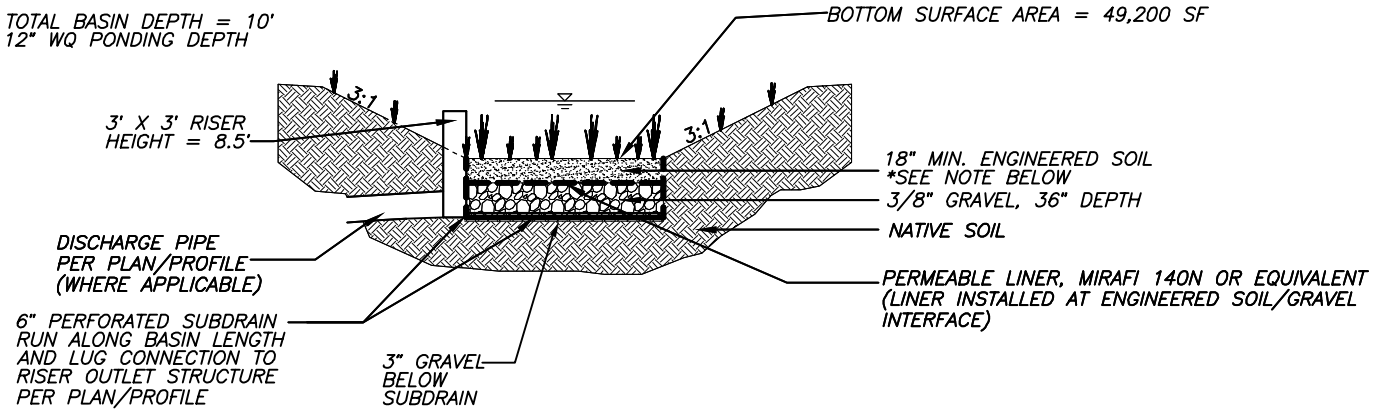
*"ENGINEERED SOIL" LAYER SHALL BE 36" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#1

Basin#2(BF-1-2)



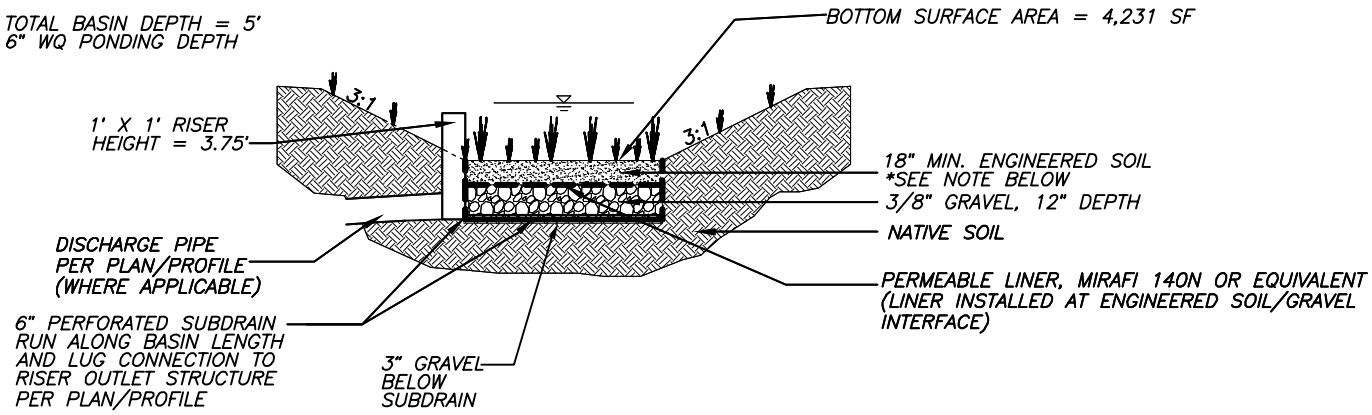
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#2

Basin#3(BF-1-3)



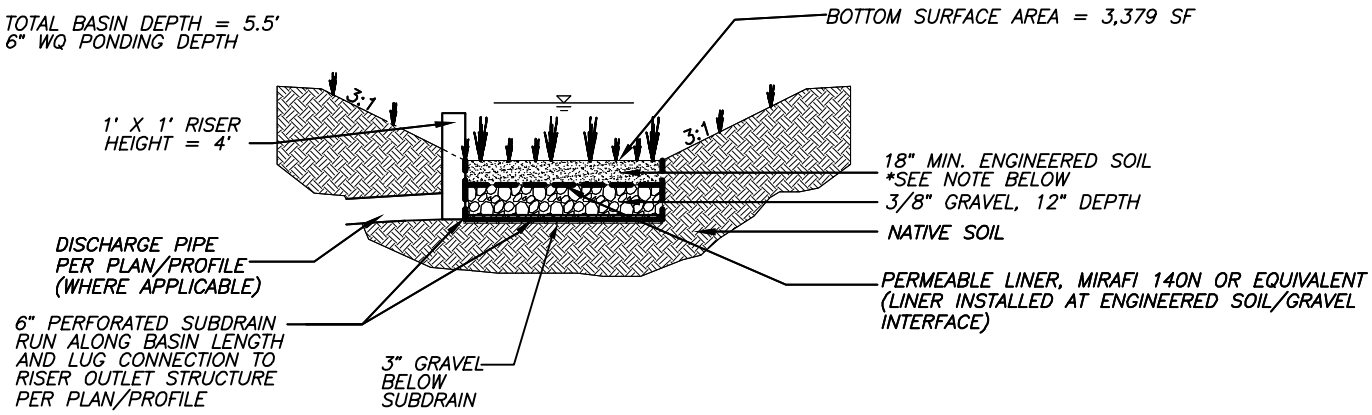
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#3

Basin#4(BF-1-4)



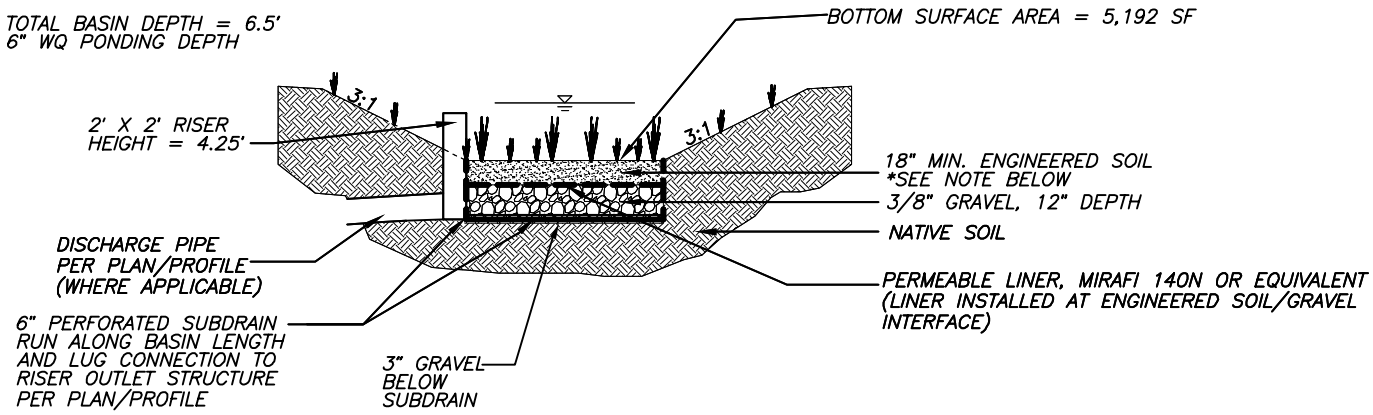
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#4

Basin#5(BF-1-5)



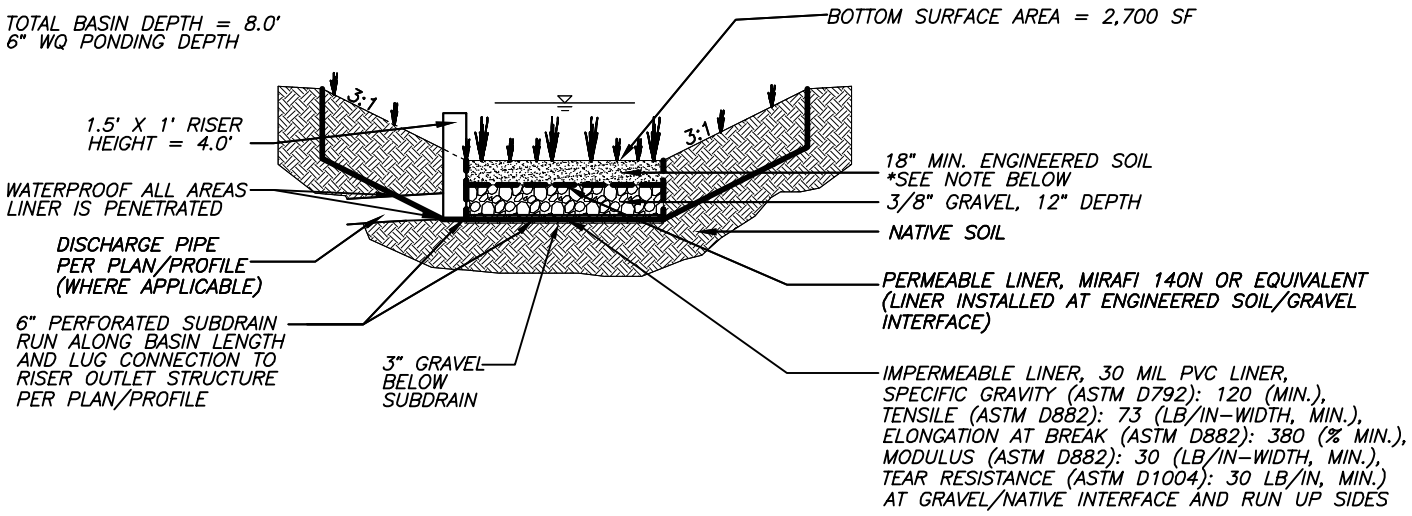
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#5

Basin#6 (BF-1-6)



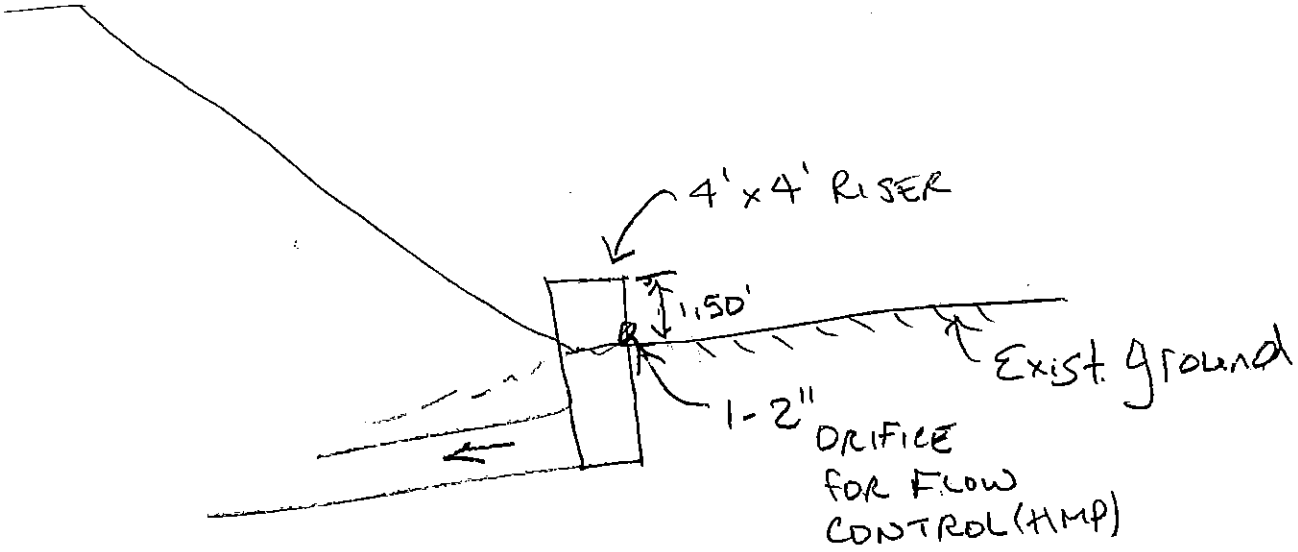
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST, AND 20-30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

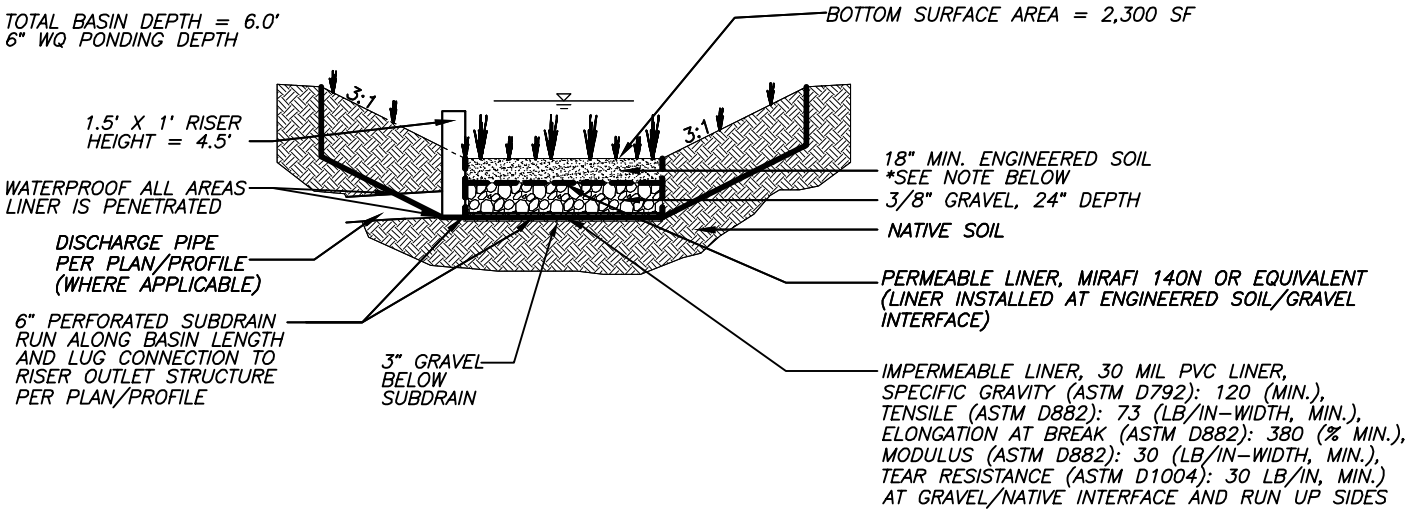
NOT TO SCALE

POC#6

HMP-2 (RISER)



Basin#7 (BF-1-7)



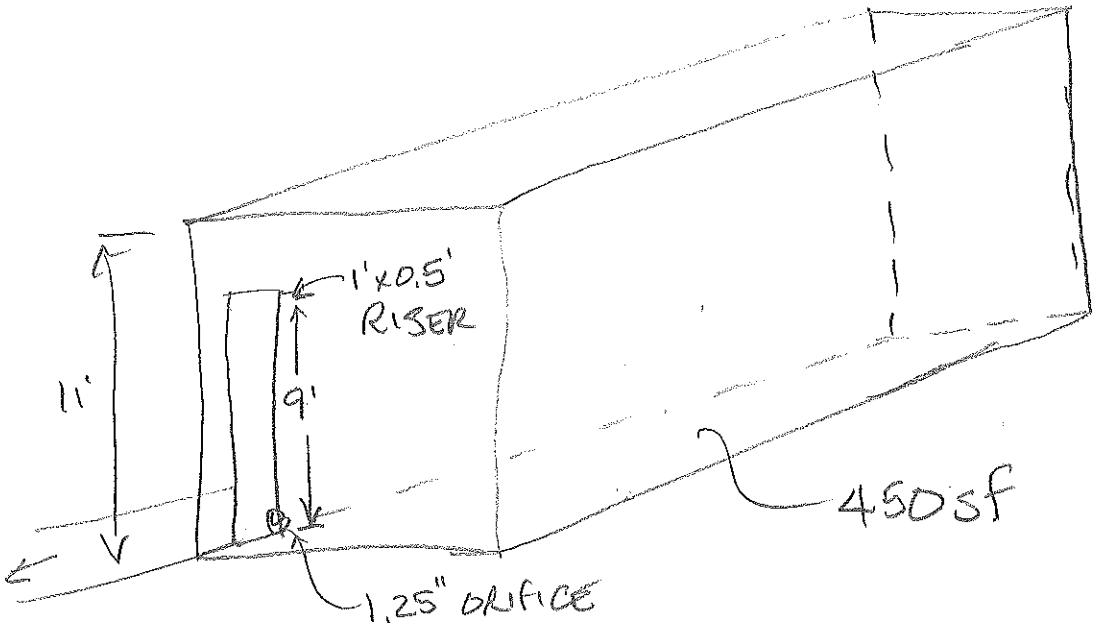
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST, AND 20-30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

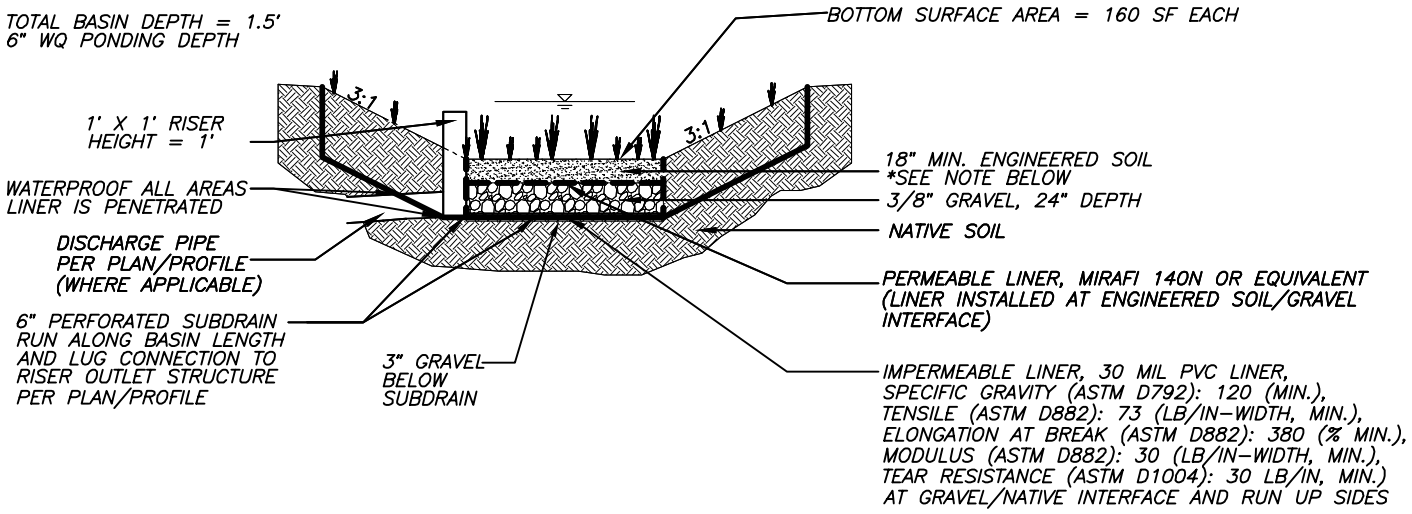
NOT TO SCALE

POC#7

HMP-1 (VAULT)



Basin#8 & 9
(BF-1-8)
(BF-1-9)



*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST, AND 20-30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#8

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

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

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☐ Included ☒ Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☒ Included Included as part of stand-alone Flow-control design document See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the BMP Design Manual.	☒ Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped by Regional or Jurisdictional approaches outlined in Appendix H.1 AND, ☐ Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment per approaches outlined in Appendix H.2 and H.3. OR, ☐ Demonstration that project does not generate a net impact on the receiving water per approaches outlined in Appendix H.4.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours

Vector Plan has not been completed at this Preliminary Phase

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

The Hydromodification Management Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Point(s) of Compliance (POC) for Hydromodification Management
☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☒ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

ATTACHMENT 2a
FLOW CONTROL FACILITY DESIGN

THIS ATTACHMENT SUBMITTED AS A SEPARATE STAND-ALONE DOCUMENT

ATTACHMENT 2b
HYDROMODIFICATION MANAGEMENT EXHIBIT

THE HYDROMODIFICATION MANAGEMENT EXHIBITS ARE INCLUDED WITHIN ATTACHMENT 2a WHICH HAS BEEN PREPARED AS A SEPARATE STAND-ALONE DOCUMENT

ATTACHMENT 2c
MANAGEMENT OF CRITICAL COARSE SEDIMENT YIELD AREAS

The following exhibit shows the San Diego County WMAA Map over-laid on the project site. Potential Critical Coarse areas are shown to drain through or by pass the site at the northern portion of the site.

600 0 600 1200 1800

SCALE 1" = 600'

LEGEND:

POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS

SUBAREA BOUNDARY

PREPARED BY:

HUNSAKER & ASSOCIATES SAN DIEGO, INC

PLANNING 9707 Waples Street
ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 FX(858)558-1414

POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS

LAND EXCHANGE ALTERNATIVE

COUNTY OF SAN DIEGO, CALIFORNIA

W.O.# 2167-0127

R:\1235\Hyd\ACAD\SWMP\TM- Land Exchange EIR\1235- CCSYA- OTAY 14.dwg[]May-01-2017:13:08

ATTACHMENT 2d
GEOMORPHIC ASSESSMENT OF
RECEIVING CHANNELS

THIS ASSESSMENT WAS NOT PERFORMED FOR THIS PROJECT

ATTACHMENT 2e
VECTOR CONTROL PLAN

VECTOR CONTROL PLAN HAS NOT BEEN PREPARED AT THIS PRELIMINARY PLANNING PHASE.

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☒ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	☐ Included ☒ Not Applicable Agreement has not been completed at this Preliminary Phase

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

Attachment 3a must identify:

- ☒ Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☒ How to access the structural BMP(s) to inspect and perform maintenance
- ☒ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☒ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☒ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the County's standard format depending on the Category (PDP applicant to contact County staff to obtain the current maintenance agreement forms). Refer to Section 7.3 in the BMP Design Manual for a description of the different categories.

TABLE 7-3. Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, The County must be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, County staff in the Watershed Protection Program must be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

BMP Maintenance Program

The following inspection and maintenance activities shall be performed and completed as indicated. Question should be directed to the San Diego County Department of Public Works at (858) 694-3810.

Maintenance Program for Inlet Stenciling

Inspection Frequency/Indications:	Regular Maintenance Inspections q Before wet season begins (September); q After wet season (April).
Maintenance Indications	**Maintenance Activities**
q Inlet stenciling/signage begins to weather or fade	q Re-stamp signage
q Broken or damaged structure	q Repair or replace signage structure

Maintenance Program for Stormwater Separation Units

Inspection Frequency/Indications:	Regular Maintenance Inspections q Monthly during wet season q Annually before wet season (September) Performance Inspection q 72 hrs after rainfall events greater than 0.5 in.
Maintenance Indications	**Maintenance Activities**
q Excessive trash, debris, or sediment in unit. (i.e., sump is 85 percent full or sump is 50 percent full during two consecutive monthly inspections)	q Remove trash and debris within 15 days. Empty unit when the unit is 85 percent full or 50 percent full during two consecutive monthly inspections, or annually in May.
q Presence of trash and debris in weir box.	q Remove trash and debris while onsite conducting inspection
q When standing water in sump is observed during annual and performance inspection.	q If standing water cannot be removed or remains through the wet season, notify vector control.
q Minor structural damage (i.e., screen becomes clogged, damaged or loose)	q Clean screen, re-fasten screen if appropriate.
q Cracked or fatigued neoprene vector seals	q Replace damaged seal
q Major damage to structures (i.e., holes in screen, large debris, damage to housing or weir box)	q Immediately consult with engineer and manufacturer=s representative to develop a course of action and effect repairs prior to the wet season.
Waste Disposal	Sediment, other pollutants, and all other waste shall be properly disposed of in a licensed landfill or by another appropriate disposal method in accordance with local, state, and federal regulations.

Maintenance Program for Riprap Energy Dissipaters

Inspection Frequency/Indications:	Regular Inspection - First Year q Before wet season begins (September); q After wet season (April). Regular Inspection - Subsequent Years q After wet season begins (April). Performance Inspection q After rainfall events greater than 0.5 inches.
Maintenance Indications	**Maintenance Activities**

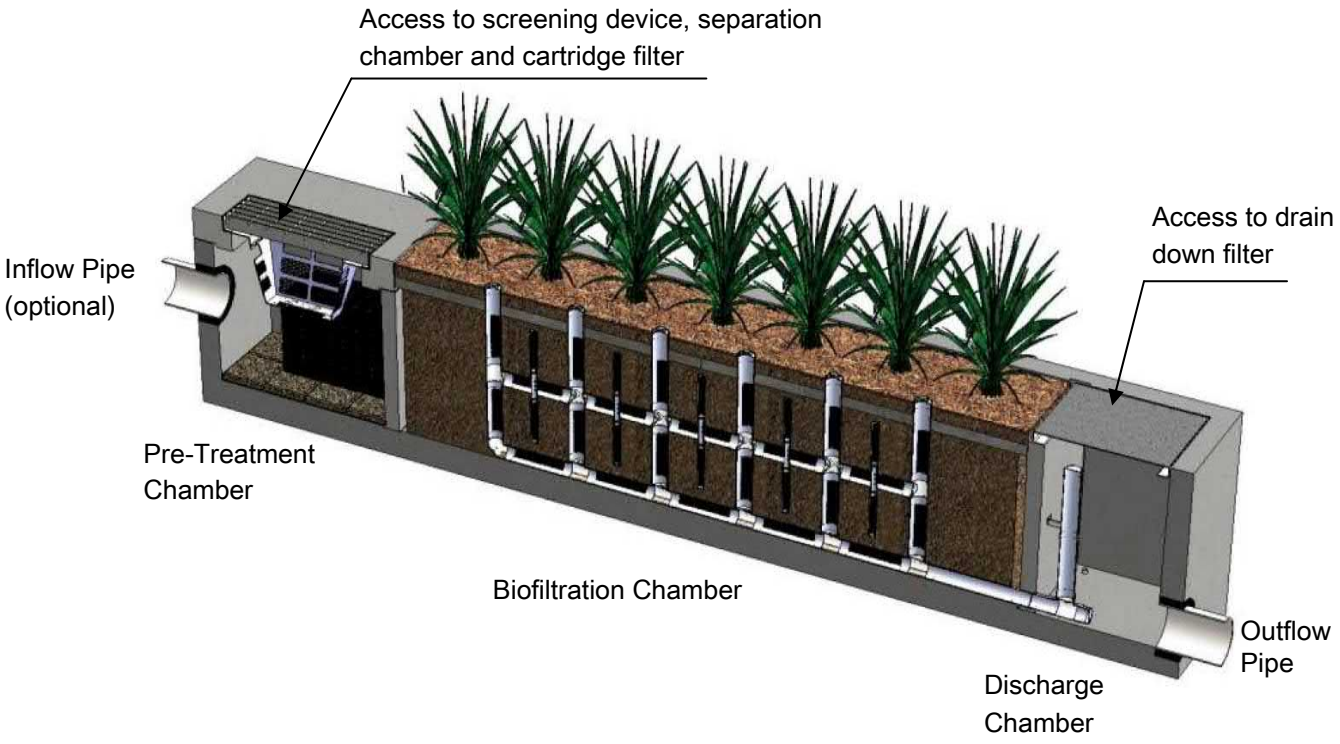
q	Damage to sill, headwall, or other structures	q	Repair sill, headwall, or other structures
q	Riprap displaced or washed away	q	Replace riprap
q	Erosion (ruts, rills, or gullies) found downstream of dissipater structure (riprap apron).	q	Extend riprap apron, reposition, increase riprap coverage to fully cover eroded area.
q	Over-grown vegetation, emergent woody vegetation and/or weeds	q	Trim vegetation to 6 inches, remove emergent woody vegetation and weeds
q	Sediment accumulation over 3 inches	q	Remove sediment accumulation
q	Trash and litter present in riprap	q	Remove trash and debris
Waste Disposal		Sediment, other pollutants, and all other waste shall be properly disposed of in a licensed landfill or by another appropriate disposal method in accordance with local, state, and federal regulations.	

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ___/___/___ Time _____ AM / PM

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes:

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

ATTACHMENT 4

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects

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County of San Diego BMP Design Manual Verification Form	
Project Summary Information	
Project Name	Otay Ranch Village 14 and Planning Area 16/19-Land Exchange Alternative
Record ID (e.g., grading/improvement plan number)	PDS2015-MPA-15004
Project Address	Proctor Valley Road between Jamul and Chula Vista
Assessor's Parcel Number(s) (APN(s))	598-070-07 & 09, 598-010-02, 598-020-04 & 06, 598-021-02, 597-140-05, 598-021-01, 598-011-01 (Por.), 597-130-13 (Por.), 597-140-01(Por.), 597-140-07 (Por.), 597-140-06 (Por.), 597-140-09 (Por.)
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Otay Hydrologic Unit, Dulzura Hydrologic Area, Proctor Hydrologic Sub Area (910.32)
Responsible Party for Construction Phase	
Developer's Name	Jackson-Pendo Development Company
Address	2245 San Diego Avenue, Ste 223 San Diego, CA 92110
Email Address	ljackson@jacksonpendo.com
Phone Number	(619) 267-4904
Engineer of Work	Alisa S. Vialpando
Engineer's Phone Number	(858) 558-4500
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	Jackson-Pendo Development Company
Address	2245 San Diego Avenue, Ste 223 San Diego, CA 92110
Email Address	ljackson@jacksonpendo.com
Phone Number	(619) 267-4904
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

County of San Diego BMP Design Manual Verification Form Page 2 of 4					
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)					
Description/Type of Structural BMP	**Plan Sheet #**	**STRUCT-URAL BMP ID#**	**Maint-enance Category**	**Maintenance Agreement Recorded Doc #**	**Revisions**
*All Priority Development Projects (PDPs) require a Structural BMP					

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

County of San Diego BMP Design Manual Verification Form Page 3 of 4

Checklist for Applicant to submit to PDCI:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Stormwater Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

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

Please sign your name and seal.

Professional Engineer's Printed Name:

_____

Professional Engineer's Signed Name:

_____

[SEAL]

Date:_____

County of San Diego BMP Design Manual Verification Form Page 4 of 4

COUNTY - OFFICIAL USE ONLY:

For PDCI: Verification Package #: _____

PDCI Inspector: _____

Date Project has/expects to close: _____

Date verification received from EOW: _____

By signing below, PDCI Inspector concurs that every noted Structural BMP has been installed per plan.

PDCI Inspector's Signature: _____ Date: _____

FOR WPP:

Date Received from PDCI: _____

WPP Submittal Reviewer: _____

WPP Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 5

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

This is the cover sheet for Attachment 5.

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

The plans must identify:

- ☐ Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
- ☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☐ Details and specifications for construction of structural BMP(s)
- ☐ Signage indicating the location and boundary of structural BMP(s) as required by County staff
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☐ All BMPs must be fully dimensioned on the plans
- ☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
- ☐ Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

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ATTACHMENT 6

Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

If hardcopy or CD is not attached, the following information should be provided:

Title: INCLUDED WITHIN CD AT END OF ATTACHMENT 7.
Prepared By:
Date:

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ATTACHMENT 7

Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

If hardcopy or CD is not attached, the following information should be provided:

Title: INCLUDED WITHIN CD AT END OF ATTACHMENT 7.
Prepared By:
Date:

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