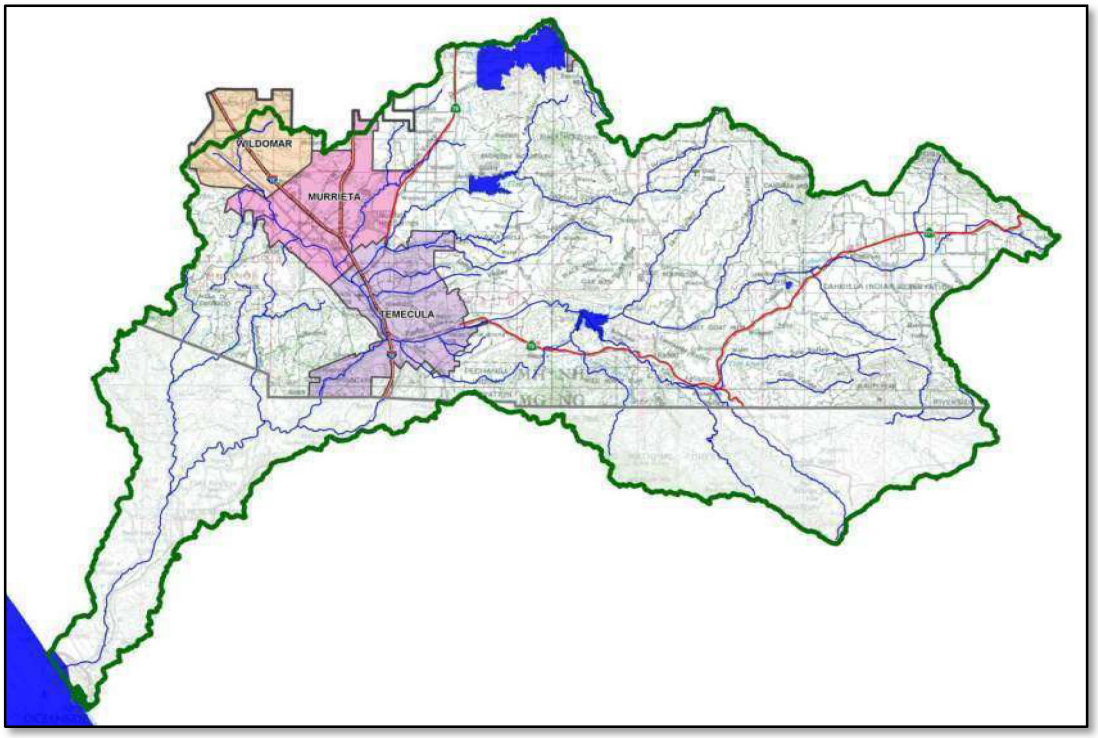
County Project Specific Preliminary Water Quality Management Plan

Project Title: **TRACT MAP NO. 38163 (Keller Crossing)**
Development No: SP 380
Design Review/Case No:
BMP$_i$ (Latitude, Longitude): 33°37'47.0496" N, 117°05'47.0544" W



☒ **Preliminary**
☐ **Final**

Original Date Prepared: July 2021

Approval Date: May 4, 2022

Revision Date(s): August 2024, January 2026

Revision Date(s):

JN. 450.907 (24.000112.2259)

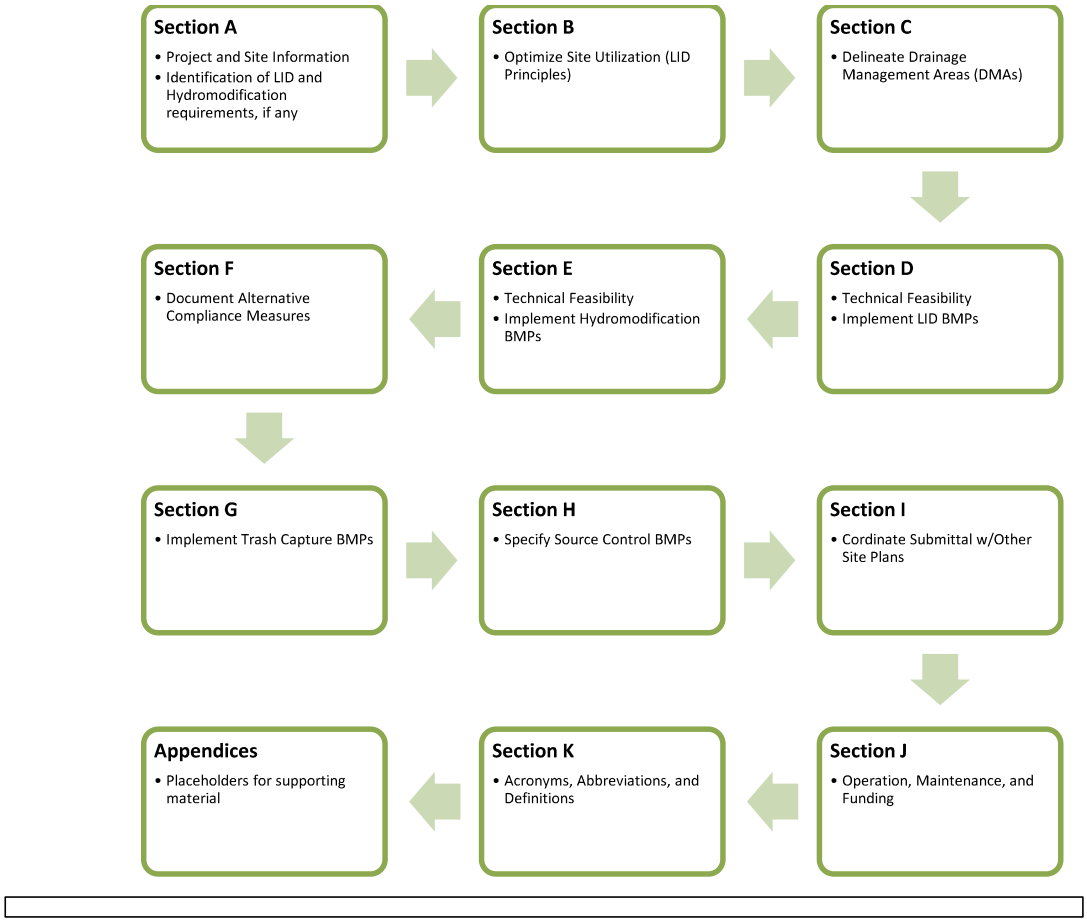
Contact Information
Prepared for: **D. R. Horton Southern California**
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Corona, CA 92880
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Based on 2018 WQMP, prepared for Compliance with Regional Board Order No. **R9-2013-0001** *as amended by Order No.* **R9-2015-0001** *and Order No.* **R9-2015-0100**

A Brief Introduction

The Regional Municipal Separate Stormwater Sewer System (MS4) Permit[1] requires that a Project-Specific WQMP be prepared for all development projects within the Santa Margarita Region (SMR) that meet the 'Priority Development Project' categories and thresholds listed in the SMR Water Quality Management Plan (WQMP). This Project-Specific WQMP Template for Development Projects in the **Santa Margarita Region** has been prepared to help document compliance and prepare a WQMP submittal. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



[1] Order No. R9-2013-0001 as amended by Order Nos. R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the MS4s Draining the Watersheds within the San Diego Region, California Regional Water Quality Control Board, May 8, 2013.

OWNER'S CERTIFICATION

This Project-Specific WQMP has been prepared for **D.R. Horton Southern California** by **RTM (K&A Engineering), Inc.** for the **Keller Crossing Development – Tract 38163** project.

This WQMP is intended to comply with the requirements of Riverside County for County Ordinance No. 754 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater Best Management Practices until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under Riverside County Water Quality Ordinance (No. 754).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control Best Management Practices in this plan meet the requirements of Regional Water Quality Control Board Order No. **R9-2013-0001** as amended by Order Nos. **R9-2015-0001 and R9-2015-0100**."

Preparer's Signature	Date
Preparer's Printed Name	SENIOR PROJECT MANAGER Preparer's Title/Position

Preparer's Licensure:
RCE 60xxx (Exp. 12/31/2024)

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Section A: Project and Site Information

Use the table below to compile and summarize basic site information that will be important for completing subsequent steps. Subsections A.1 through A.4 provide additional detail on documentation of additional project and site information. The Regional MS4 Permit has effectively removed the ability for a project to be grandfathered from WQMP requirements. Even if a project were able to meet all the requirements stated in Section 1.2 of the WQMP, the 2014 WQMP requirements would apply.

PROJECT INFORMATION	
Type of PDP:	New Development
Type of Project:	Residential
Planning Case Number:	SP 380
Rough Grade Permit No.:	
Development Name:	Keller Crossing Development – Tract 38163
PROJECT LOCATION	
Latitude & Longitude (DMS):	33°37'47.0496" N, 117°05'47.0544" W
Project Watershed and Sub-Watershed:	Santa Margarita River, Warm Springs Creek
24-Hour 85th Percentile Storm Depth (inches):	0.57
Is project subject to Hydromodification requirements?	☒ Y ☐ N (Select based on Section A.3)
APN(s):	476-010-056
Map Book and Page No.:	Book 64, Page 28
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Residential
Proposed or Potential SIC Code(s)	N/A
Existing Impervious Area of Project Footprint (SF)	8,337,384 sf
Total area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	685,199 sf
Total Project Area (ac)	191.4 Ac gross, 120 Ac net
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
Has preparation of Project-Specific WQMP included coordination with other site plans?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Is the project located within any Multi-Species Habitat Conservation Plan area (MSHCP Criteria Cell?)	☒ Y ☐ N Group U, Cell 5067
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the Natural Resources Conservation Service (NRCS) soils type(s) present on the site (A, B, C and/or D)	Soil Types B, C & D

Provide a brief description of the project:

The Keller Crossing Development project consists of approximately 191.4 acres and proposes land uses that include single family residential, high density residential, park and open space areas.
Topographic conditions on most of the Keller Crossing Development site consist of gentle rolling hills with a sloped rise in elevation from existing Keller Road to the northern edge boundary. The site is currently bounded by Pourroy Road to the west, Winchester Highway (HWY-79) to the east, and Keller Road to the

south. The northerly boundary of the project adjoins areas that have been designated as Conservation Habitat which will remain undeveloped.

The Keller Crossing Development – Tract 38163 is under the jurisdiction of Riverside County Flood Control & Water Conversation District (RCFC&WCD) and Riverside County Transportation District. The project runoff ultimately discharges into the Santa Margarita River in Temecula and has been determined, under the Regional MS4 Permit to be within the Santa Margarita Watershed Management Area of Riverside County. Therefore, RCFC&WCD is the Principal Permittee of the Santa Margarita MS4 Permit.

There are three distinct drainage areas in this project. They have been labeled as Areas C, F and G.

Area C: Drainage Area C (on-site), Subareas C-15 through C-35 consists of **DMA Area C Residential** (91.8 acre), including **subarea C-26 Water Quality/Detention Basin C** (5.3 acre). These DMAs will drain into Water Quality/Detention Basin C prior exiting the project boundary and combine with Drainage Area C (off-site) subareas C-1 thru C-12 (209.1 acre) into proposed Debris/Detention Basin C (off-site) then outleting into the existing natural stream to the south side of the project.

Area F: Drainage Subareas **DMAs F-5 thru F-8** consist of approximately 16.4 acre for detach residential will drain into proposed **Water Quality Basin E** (Area E-2 = 0.7 acre). The Water Quality Basin E will intercept the water quality volume from **DMA Area F** (subareas F-4 thru F-8) and outlet into an existing Winchester Highway culvert. The basin overflow will drain into the proposed Detention Basin F (Area F-4 = 2.9 acre). and subareas F-1 thru F-3 (38.5 acre) are offsite natural areas will drain into Detention Basin F prior exiting the project and combine with offsite street areas downstream F-9 (1.7 acre) into existing Winchester Highway culvert.

Area G: The proposed **DMA Area G (**subarea G-1) consists of approximately 5.5 acre for multifamily will drain into **Water Quality/Detention Basin G** prior exiting the project site and combine with the remaining subarea G-2 of 1.7 acre street area downstream offsite into the existing Winchester Highway culvert.

Keller Crossing Development Drainage Plan addresses proper drainage and water quality mitigation for the proposed development and to be consistent with Riverside County Flood Control and Water Conservation District (RCFC&WCD) and Riverside County Transportation Department specific requirements. The existing pre-developed condition and post-developed condition of the project are analyzed to ensure minimal impact into adjoining communities and existing downstream storm drain infrastructures. Water quality mitigation has also been implemented to integrate with the overall drainage design of the entire project with the application of water quality basins and treatment structures - as the project has been designated to comply with Santa Margarita MS4 Permit and its specific requirements.

Run-on from the site will be conveyed to the proposed Biofiltration basins via storm drain system. The run-on will be treated within the Biofiltration basins prior to being released into the existing Caltrans culverts per storm drain plan as shown on as built drawing .

The project is located at Latitude & Longitude 33°37’47.0496” N, 117°05’47.0544” W

Access

Access for construction activities will be located at entrance from Keller Road from the south and Winchester Road from the east side of the project side.

Paver and dirt roads are considered pervious for determining WQMP applicability.

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the Project vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Vicinity and location maps
- Parcel Boundary and Project Footprint
- Existing and Proposed Topography
- Drainage Management Areas (DMAs)
- Proposed Structural Best Management Practices (BMPs)
- Drainage Paths
- Drainage infrastructure, inlets, overflows
- Source Control BMPs
- Site Design BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Pervious Surfaces (i.e. Landscaping)
- Standard Labeling
- Cross Section and Outlet details

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Copermittee plan reviewer must be able to easily analyze your Project utilizing this template and its associated site plans and maps. Complete the checklists in Appendix 1 to verify that all exhibits and components are included.

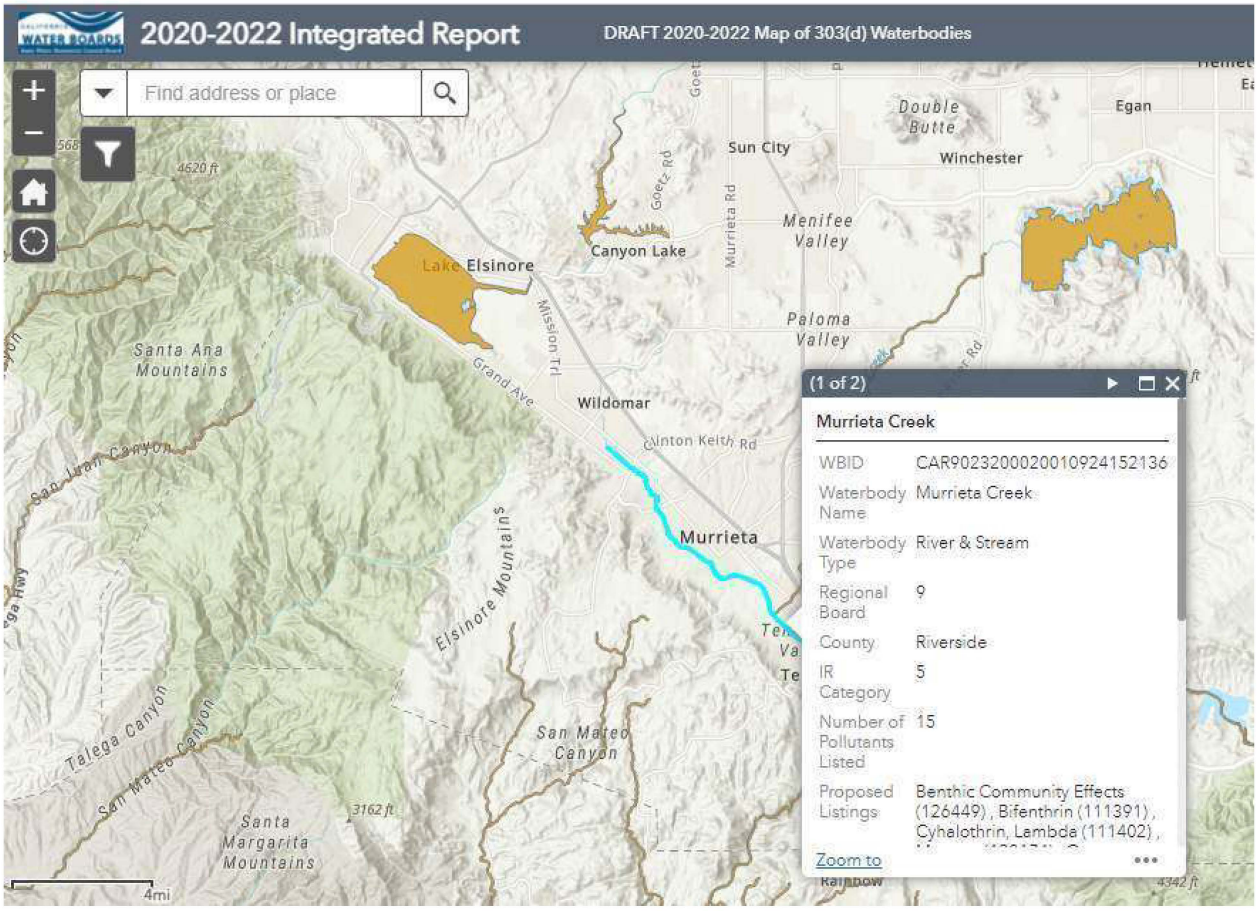
A.2 Identify Receiving Waters

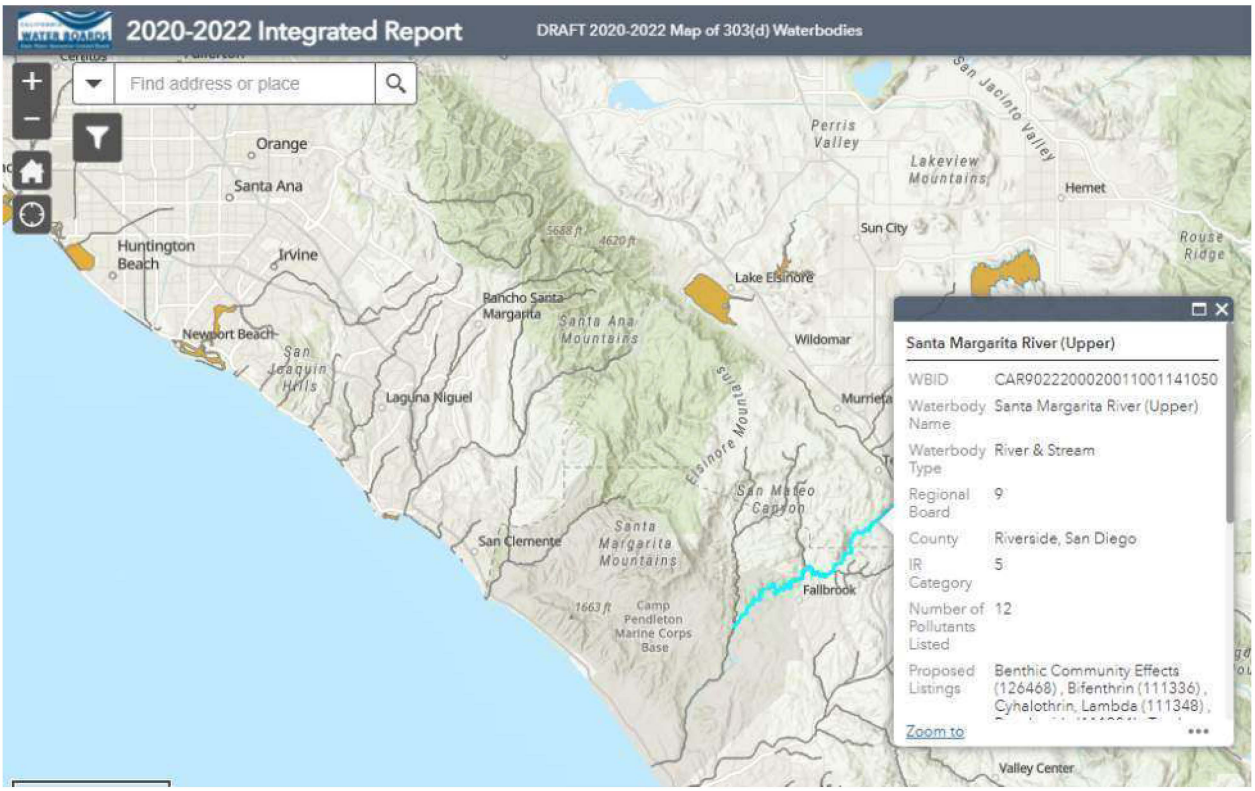
Using Table A-1 below, list in order of upstream to downstream, the Receiving Waters that the Project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated Beneficial Uses, and proximity, if any, to a RARE Beneficial Use. Include a map of the Receiving Waters in Appendix 1. This map should identify the path of the stormwater discharged from the site all the way to the outlet of the Santa Margarita River to the Pacific Ocean. Use the most recent 303(d) list available from the State Water Resources Control Board Website.
(http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/)

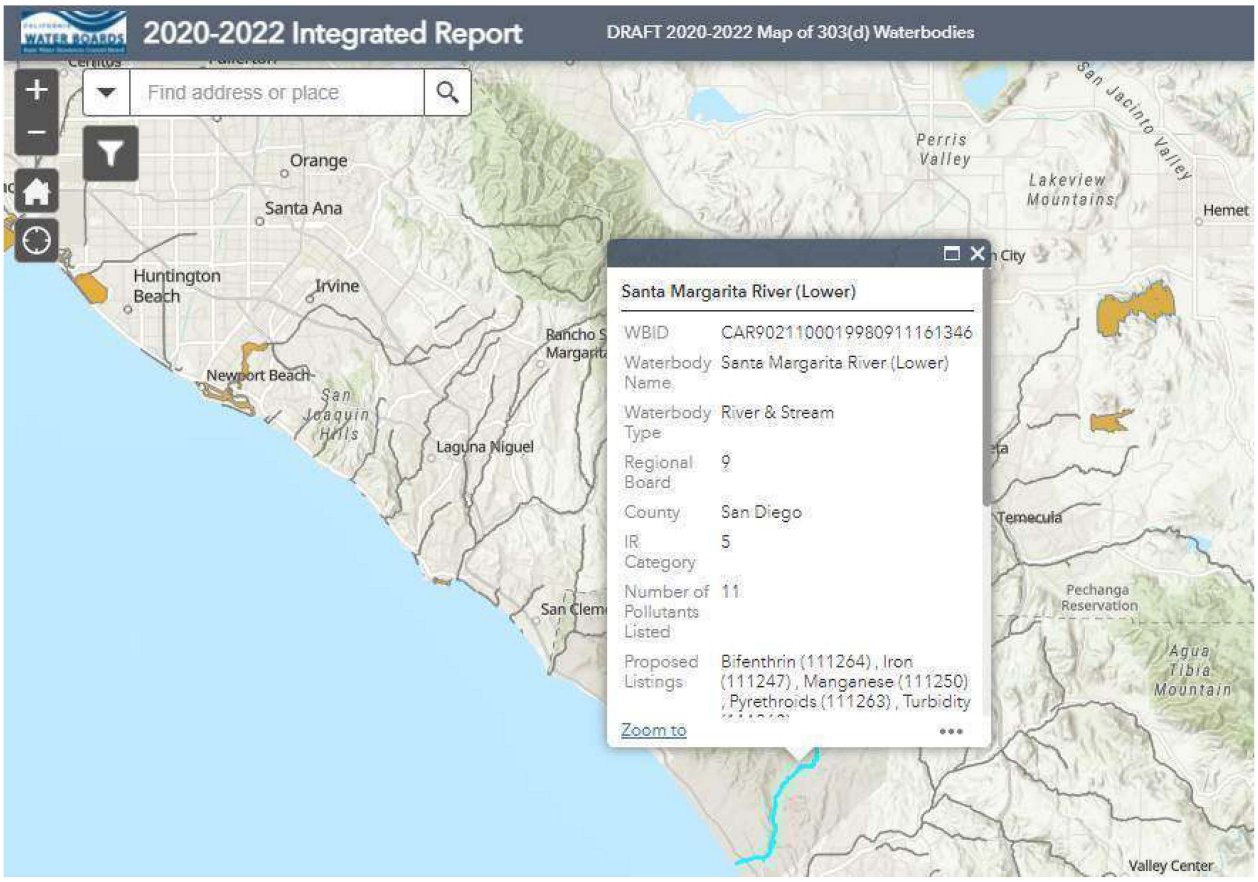
Table A-1 Identification of Receiving Waters

Receiving Waters	USEPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Warm Spring Creek	Chlorpyrifos, Indicator Bacteria, Iron, Manganese, Nitrogen, Phosphorus.	N/A	None
Murietta Creek	Indicator Bacteria, Iron, Manganese, Phosphorus, Toxicity, Nitrogen	MUN, AGR, IND, PROC, GWR, REC1, REC2, WARM, WILD, SPWN	None
Santa Margarita River (Upper)	Iron, Manganese, Nitrogen, Phosphorus, Toxicity	MUN, AGR, IND, REC1, REC2, WARM, COLD, WILD, RARE	18 miles
Santa Margarita River (Lower)	Chlorpyrifos, Indicator Bacteria, Nitrogen, Phosphorus, Toxicity	MUN, AGR, IND, REC1, REC2, WARM, COLD, WILD, RARE	18 miles


2020-2022 Integrated Report
DRAFT 2020-2022 Map of 303(d) Waterbodies
Find address or place
Domenigoni Pkwy
Menifee Valley
Canyon Lake
Newport Rd
Murrieta
Antelope Rd
Sedco Hills
2268 ft
Paloma Valley
2266 ft
Wildomar
Palomar St
Clinton Keith Rd
Nutmeg St
15
Rawson Canyon
2668 ft
Warm Springs Creek (Riverside County)
WBID CAR9023300020080825005933
Waterbody Name Warm Springs Creek (Riverside County)
Waterbody Type River & Stream
Regional Board 9
County Riverside
IR Category 5
Number of Pollutants Listed 6
Proposed Listings
Existing Chlorpyrifos (77375), Iron
Zoom to


2020-2022 Integrated Report
DRAFT 2020-2022 Map of 303(d) Waterbodies
Find address or place
Double Butte
Egan
Winchester
Sun City
Goetz Rd
Murrieta Rd
Menifee Valley
Canyon Lake
Lake Elsinore
Paloma Valley
Santa Ana Mountains
Mission Trl
Grand Ave
Wildomar
Clinton Keith Rd
San Juan Canyon
Murrieta
Elsinore Mountains
Talega Canyon
San Mateo Canyon
San Mateo Canyon
Santa Margarita Mountains
3162 ft
4620 ft
4mi
(1 of 2)
Murrieta Creek
WBID CAR9023200020010924152136
Waterbody Name Murrieta Creek
Waterbody Type River & Stream
Regional Board 9
County Riverside
IR Category 5
Number of Pollutants Listed 15
Proposed Listings Benthic Community Effects (126449), Bifenthrin (111391), Cyhalothrin, Lambda (111402),
Zoom to
Rainbow
4342 ft


2020-2022 Integrated Report
DRAFT 2020-2022 Map of 303(d) Waterbodies
Find address or place
Orange
Santa Ana
Huntington Beach
Irvine
Newport Beach
Laguna Niguel
San Clemente
Rancho Santa Margarita
Lake Elsinore
Wildomar
Murrieta
Sun City
Perris Valley
Lakeview Mountains
Hemet
San Jacinto Valley
Rouse Ridge
Fallbrook
Valley Center
Camp Pendleton Marine Corps Base
Santa Margarita River (Upper)
WBID CAR902220002001100141050
Waterbody Name Santa Margarita River (Upper)
Waterbody Type River & Stream
Regional Board 9
County Riverside, San Diego
IR Category 5
Number of Pollutants Listed 12
Proposed Listings Benthic Community Effects (126468), Bifenthrin (111336), Cyhalothrin, Lambda (111348),
Zoom to


2020-2022 Integrated Report
DRAFT 2020-2022 Map of 303(d) Waterbodies
Find address or place
Orange
Santa Ana
Huntington Beach
Irvine
Newport Beach
Laguna Niguel
Perris Valley
Lakeview Mountains
Hemet
San Jacinto Valley
Temecula
Pechanga Reservation
Agua Tibia Mountain
Valley Center
Santa Margarita River (Lower)
WBID CAR902110001998091116134 6
Waterbody Name Santa Margarita River (Lower)
Waterbody Type River & Stream
Regional Board 9
County San Diego
IR Category 5
Number of Pollutants Listed 11
Proposed Listings Bifenthrin (111264), Iron (111247), Manganese (111250), Pyrethroids (111263), Turbidity
Zoom to

A.3 Drainage System Susceptibility to Hydromodification

Using Table A-2 below, list in order of the point of discharge at the project site down to the Santa Margarita River[2], each drainage system or receiving water that the project site is tributary to. Continue to fill each row with the material of the drainage system, and any exemption (if applicable). Based on the results, summarize the applicable hydromodification performance standards that will be documented in Section E. Exempted categories of receiving waters include:

- Existing storm drains that discharge directly to water storage reservoirs, lakes, or enclosed embayments, or
- 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.
- Other water bodies identified in an approved WMAA (See Exhibit G to the WQMP)

Include a map exhibiting each drainage system and the associated susceptibility in Appendix 1.

Table A-2 Identification of Susceptibility to Hydromodification

Drainage System	Drainage System Material	Hydromodification Exemption	Hydromodification Exempt
Warm Spring Creek	Natural Channel, Not Engineered and Engineered, open channel	Potential Susceptible	☐ Y ☒ N
Murrieta Creek	River and Stream	Not Susceptible	☒ Y ☐ N
Santa Margarita River (Upper)	River and Stream	Not Susceptible	☒ Y ☐ N
Santa Margarita River (Lower)	River and Stream	Not Susceptible	☒ Y ☐ N
Summary of Performance Standards			
☐ **Hydromodification Exempt** – Select if "Y" is selected in the Hydromodification Exempt column above, project is exempt from hydromodification requirements.			
☒ **Not Exempt**-Select if "N" is selected in any row of the Hydromodification Exempt column above. Project is subject to hydrologic control requirements and may be subject to sediment supply requirements.			

[2] Refer to Exhibit G of the WQMP for a map of exempt and potentially exempt areas. These maps are from the Draft SMR WMAA as of January 5, 2018 and will be replaced upon acceptance of the SMR WMAA.

A.4 Additional Permits/Approvals required for the Project:

Table A-3 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act Section 401 Water Quality Certification	☐ Y	☒ N
US Army Corps of Engineers, Clean Water Act Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* Grading Permit, Building Permit	☒ Y	☐ N

If yes is answered to any of the questions above, the Copermittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

All applicable permits will be included in the Final WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for LID Bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your Low Impact Development (LID) design and explain your design decisions to others.

Apply the following LID Principles to the layout of the PDP to the extent they are applicable and feasible. Putting thought upfront about how best to organize the various elements of a site can help to significantly reduce the PDP's potential impact on the environment and reduce the number and size of Structural LID BMPs that must be implemented. Integrate opportunities to accommodate the following LID Principles within the preliminary PDP site layout to maximize implementation of LID Principles.

Site Optimization

Complete checklist below to determine applicable Site Design BMPs for your site.

Project- Specific WQMP Site Design BMP Checklist

The following questions below are based upon Section 3.2 of the SMR WQMP will help you determine how to best optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

SITE DESIGN REQUIREMENTS

Answer the following questions below by indicating "Yes," "No," or "N/A" (Not Applicable). Justify all "No" and "N/A" answers by inserting a narrative at the end of the section. The narrative should include identification and justification of any constraints that would prevent the use of those categories of LID BMPs. Upon identifying Site Design BMP opportunities, include these on your WQMP Site plan in Appendix 1.

☒ Yes ☐ No ☐ N/A

Did you identify and preserve existing drainage patterns?

Integrating existing drainage patterns into the site plan helps to maintain the time of concentration and infiltration rates of runoff, decreasing peak flows, and may also help preserve the contribution of Critical Coarse Sediment (i.e., Bed Sediment Supply) from the PDP to the Receiving Water. Preserve existing drainage patterns by:

- Minimizing unnecessary site grading that would eliminate small depressions, where appropriate add additional "micro" storage throughout the site landscaping.
- Where possible conform the PDP site layout along natural landforms, avoid excessive grading and disturbance of vegetation and soils, preserve or replicate the sites natural drainage features and patterns.
- Set back PDP improvements from creeks, wetlands, riparian habitats and any other natural water bodies.
- Use existing and proposed site drainage patterns as a natural design element, rather than using expensive impervious conveyance systems. Use depressed landscaped areas, vegetated buffers, and bioretention areas as amenities and focal points within the site and landscape design.

Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer.
The grading and drainage design of Keller Crossing project has been developed to maintain the natural discharge patterns as much as practical.
The developed site will consist of landscape front and back yards at all SFR lots, landscape area in the recreational center area, vegetated parkway strips and parks.

☒ Yes ☐ No ☐ N/A

Did you identify and protect existing vegetation?

Identify any areas containing dense native vegetation or well-established trees, and try to avoid disturbing these areas. Soils with thick, undisturbed vegetation have a much higher capacity to store and infiltrate runoff than do disturbed soils. Reestablishment of a mature vegetative community may take decades. Sensitive areas, such as streams and floodplains should also be avoided.

- Define the development envelope and protected areas, identifying areas that are most suitable for development and areas that should be left undisturbed.
- Establish setbacks and buffer zones surrounding sensitive areas.
- Preserve significant trees and other natural vegetation where possible.

Project- Specific WQMP Site Design BMP Checklist

Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer.
Presently, dense vegetation or areas of well-established trees do not exist. The project area is plowed in rows and lies fallow with no vegetation. See Aerial below:.



☒ Yes ☐ No ☐ N/A

Did you identify and preserve natural infiltration capacity?

A key component of LID is taking advantage of a site's natural infiltration and storage capacity. A site survey and geotechnical investigation can help define areas with high potential for infiltration and surface storage.

- Identify opportunities to locate LID Principles and Structural BMPs in highly pervious areas. Doing so will maximize infiltration and limit the amount of runoff generated.
- Concentrate development on portions of the site with less permeable soils, and preserve areas that can promote infiltration.

Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer.
Over 50% of the project site will be set aside for use as open space, landscaping, park and Bio-filtration Basin BMPs. Some landscape areas will be depressed 3" to serve as self-retaining areas but the entire site will rely on Bio-filtration/Detention Basin for removal of the pollutants of concern.

Project- Specific WQMP Site Design BMP Checklist	
☒ Yes ☐ No ☐ N/A	**Did you minimize impervious area?** Look for opportunities to limit impervious cover through identification of the smallest possible land area that can be practically impacted or disturbed during site development. • Limit overall coverage of paving and roofs. This can be accomplished by designing compact, taller structures, narrower and shorter streets and sidewalks, clustering buildings and sharing driveways, smaller parking lots (fewer stalls, smaller stalls, and more efficient lanes), and indoor or underground parking. • Inventory planned impervious areas on your preliminary site plan. Identify where permeable pavements, or other permeable materials, such as crushed aggregate, turf block, permeable modular blocks, pervious concrete or pervious asphalt could be substituted for impervious concrete or asphalt paving. This will help reduce the amount of Runoff that may need to be addressed through Structural BMPs. • Examine site layout and circulation patterns and identify areas where landscaping can be substituted for pavement, such as for overflow parking. • Consider green roofs. Green roofs are roofing systems that provide a layer of soil/vegetative cover over a waterproofing membrane. A green roof mimics pre-development conditions by filtering, absorbing, and evapotranspiring precipitation to help manage the effects of an otherwise impervious rooftop.
Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer. *The grading and drainage design of Keller Crossing has been developed to maintain the natural discharge patterns as much as practical. The proposed drainage plan will provide for construction of Biofiltration/Detention Basin as structural BMPs.*	
☒ Yes ☐ No ☐ N/A	**Did you identify and disperse runoff to adjacent pervious areas or small collection areas?** Look for opportunities to direct runoff from impervious areas to adjacent landscaping, other pervious areas, or small collection areas where such runoff may be retained. This is sometimes referred to as reducing Directly Connected Impervious Areas. • Direct roof runoff into landscaped areas such as medians, parking islands, planter boxes, etc., and/or areas of pervious paving. Instead of having landscaped areas raised above the surrounding impervious areas, design them as depressed areas that can receive Runoff from adjacent impervious pavement. For example, a lawn or garden depressed 3"-4" below surrounding walkways or driveways provides a simple but quite functional landscape design element. • Detain and retain runoff throughout the site. On flatter sites, smaller Structural BMPs may be interspersed in landscaped areas among the buildings and paving. • On hillside sites, drainage from upper areas may be collected in conventional catch basins and piped to landscaped areas and LID BMPs and/or Hydrologic Control BMPs in lower areas. Low retaining walls may also be used to create terraces that can accommodate LID BMPs. Wherever possible, direct drainage from landscaped slopes offsite and not to impervious surfaces like parking lots. • Reduce curb maintenance and provide for allowances for curb cuts. • Design landscaped areas or other pervious areas to receive and infiltrate runoff from nearby impervious areas. • Use Tree Wells to intercept, infiltrate, and evapotranspire precipitation and runoff before it reaches structural BMPs. Tree wells can be used to limit the size of Drainage Management Areas that must be treated by structural BMPs. Guidelines for Tree Wells are included in the Tree Well Fact Sheet in the LID BMP Design Handbook.

Project- Specific WQMP Site Design BMP Checklist

Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer.
The grading and drainage design of Keller Crossing has been developed to maintain the natural discharge patterns as much as practical. The proposed drainage plan will provide for construction of Biofiltration/Detention basin as the primary structural BMP.

In the developed condition, runoff from impervious areas will be routed though pervious landscaping as best possible; 1. Runoff from rooftops will be routed to downspouts which outlet to landscaping as opposed to outletting directly onto paved areas. 2. Landscaped parkways will be used along some portions of sidewalk to maximize pervious area on the site. 3. Landscaped area within the residential layout will be used to disconnect paved areas as best possible.

☒ Yes ☐ No ☐ N/A

Did you utilize native or drought tolerant species in site landscaping?

Wherever possible, use native or drought tolerant species within site landscaping instead of alternatives. These plants are uniquely suited to local soils and climate and can reduce the overall demands for potable water use associated with irrigation.

Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer.
The proposed landscape will be used native or drought tolerant species as much as practical.

☐ Yes ☒ No ☐ N/A

Did implement harvest and use of runoff?

Under the Regional MS4 Permit, Harvest and Use BMPs must be employed to reduce runoff on any site where they are applicable and feasible. However, Harvest and Use BMPs are effective for retention of stormwater runoff only when there is adequate demand for non-potable water during the wet season. If demand for non-potable water is not sufficiently large, the actual retention of stormwater runoff will be diminished during larger storms or during back-to-back storms.

For the purposes of planning level Harvest and Use BMP feasibility screening, Harvest and Use is only considered to be a feasible if the total average wet season demand for non-potable water is sufficiently large to use the entire DCV within 72 hours. If the average wet season demand for non-potable water is not sufficiently large to use the entire DCV within 72 hours, then Harvest and Use is not considered to be feasible and need not be considered further.

The general feasibility and applicability of Harvest and Use BMPs should consider:

- Any downstream impacts related to water rights that could arise from capturing stormwater (not common).
- Conflicts with recycled water used – where the project is conditioned to use recycled water for irrigation, this should be given priority over stormwater capture as it is a year-round supply of water.
- Code Compliance - If a particular use of captured stormwater, and/or available methods for storage of captured stormwater would be contrary to building codes in effect at the time of approval of the preliminary Project-Specific WQMP, then an evaluation of harvesting and use for that use would not be required.
- Wet season demand – the applicant shall demonstrate, to the acceptance of the County of Riverside, that there is adequate demand for harvested water during the wet season to drain the system in a reasonable amount of time.

Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer.
The proposed project would not feasible to Harvest and Use for non-potable water within the project.

Project- Specific WQMP Site Design BMP Checklist	
☒ Yes ☐ No ☐ N/A	**Did you keep the runoff from sediment producing pervious area hydrologically separate from developed areas that require treatment?** Pervious area that qualify as self-treating areas or off-site open space should be kept separate from drainage to structural BMPs whenever possible. This helps limit the required size of structural BMPs, helps avoid impacts to sediment supply, and helps reduce clogging risk to BMPs.
Discuss how this was included or provide a discussion/justification for "No" or "N/A" answer. *The grading and drainage design of Keller Crossing Develpment has been developed to maintain the natural discharge patterns as much as practical. More than half of the project areas will be maintained as natural to include the existing natural streams.*	

Section C: Delineate Drainage Management Areas (DMAs) & Green Streets

This section provides streamlined guidance and documentation of the DMA delineation and categorization process, for additional information refer to the procedure in Section 3.3 of the SMR WQMP which discusses the methods of delineating and mapping your project site into individual DMAs. Complete Steps 1 to 4 to successfully delineate and categorize DMAs.

Step 1: Identify Surface Types and Drainage Pathways

Carefully delineate pervious areas and impervious areas (including roofs) throughout site and identify overland flow paths and above ground and below ground conveyances. Also identify common points (such as BMPs) that these areas drain to.

Step 2: DMA Delineation

Use the information in Step 1 to divide the entire PDP site into individual, discrete DMAs. Typically, lines delineating DMAs follow grade breaks and roof ridge lines. Where possible, establish separate DMAs for each surface type (e.g., landscaping, pervious paving, or roofs). Assign each DMA a unique code and determine its size in square feet. The total area of your site should total the sum of all of your DMAs (unless water from outside the project limits comingles with water from inside the project limits, i.e. run-on). Complete Table C-1

Table C-1 DMA Identification

DMA Name or Identification	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
Drainage Area C			
DMA Area C (on-site), subarea C-15 through C-35, Residential (86.5 Ac)	Mix surface	3,767,940 sf	Type "D"
DMA Area C-26, Biofiltration Basin (5.3 Ac)	Ornamental Landscape	230,868 sf	Type "D"
Drainage Area F			
DMA Area F, subareas F-5 thru F-8, Residential (16.4 Ac)	Mix surface	714,384 sf	Type "D"
DMA E-2 (0.7 Ac)	Biofiltration Basin E (for DMAs F-5 thru F-8), Ornamental Landscape	30,492 sf	Type "D"
DMA Area G, subarea G-1, Multi Family (5.5 Ac)	Mix surface	241,322 sf	Type "D"

Add Columns as Needed. Consider a separate DMA for Tree Wells or other LID principals like Self-Retaining areas are used for mitigation.

Step 3: DMA Classification

Determine how drainage from each DMA will be handled by using information from Steps 1 and 2 and by completing Steps 3.A to 3.C. Each DMA will be classified as one of the following four types:

- Type 'A': Self-Treating Areas:
- Type 'B': Self-Retaining Areas
- Type 'C': Areas Draining to Self-Retaining Areas
- Type 'D': Areas Draining to BMPs

Tree wells are considered Type 'B' areas, and their tributary areas limited to a 10:1 ratio are considered Type 'C' areas. If Tree wells are proposed, consider grading or other features to minimize the pervious runoff to the tree wells, to avoid overwhelming the trees. Type 'A', 'B', and 'C' are considered LID Principals that can be used to minimize or potentially eliminate structural LID BMPs.

If Tree wells are proposed, a landscape architect shall be consulted on the tree selection, since compliance will be determined based on the survival of the tree. The tree type should be noted on the WQMP site map.

Step 3.A – Identify Type 'A' Self-Treating Area

Indicate if the DMAs meet the following criteria by answering "Yes" or "No".

☐ Yes ☒ No	Area is undisturbed from their natural condition OR restored with Native and/or California Friendly vegetative covers.
☐ Yes ☒ No	Area is irrigated, if at all, with appropriate low water use irrigation systems to prevent irrigation runoff.
☐ Yes ☒ No	Runoff from the area will not comingle with runoff from the developed portion of the site, or across other landscaped areas that do not meet the above criteria.

If all answers indicate "Yes," complete Table C-2 to document the DMAs that are classified as Self-Treating Areas.

Table C-2 Type 'A', Self-Treating Areas

DMA Name or Identification	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)

Step 3.B – Identify Type 'B' Self-Retaining Area and Type 'C' Areas Draining to Self-Retaining Areas

Type 'B' Self-Retaining Area: A Self-Retaining Area is shallowly depressed 'micro infiltration' areas designed to retain the Design Storm rainfall that reaches the area, without producing any Runoff.

Indicate if the DMAs meet the following criteria by answering "Yes," "No," or "N/A".

☐ Yes ☐ No ☒ N/A	Inlet elevations of area/overflow drains, if any, should be clearly specified to be three inches or more above the low point to promote ponding.
☐ Yes ☐ No ☒ N/A	Soils will be freely draining to not create vector or nuisance conditions.
☐ Yes ☐ No ☒ N/A	Pervious pavements (e.g., crushed stone, porous asphalt, pervious concrete, or permeable pavers) can be self-retaining when constructed with a gravel base course four or more inches deep below any underdrain discharge elevation.

If all answers indicate "Yes," DMAs may be categorized as Type 'B', proceed to identify Type 'C' Areas Draining to Self-Retaining Areas.

Type 'C' Areas Draining to Self-Retaining Areas: Runoff from impervious or partially pervious areas can be managed by routing it to Self-Retaining Areas consistent with the LID Principle discussed in SMR WQMP Section 3.2.5 for 'Dispersing Runoff to Adjacent Pervious Areas'.
Indicate if the DMAs meet the following criteria by answering "Yes" or "No".

☐ Yes ☒ No	The drainage from the tributary area must be directed to and dispersed within the Self-Retaining Area.
☐ Yes ☒ No	The maximum ratio of Tributary Area to Self-Retaining area is (2 ÷ Impervious Fraction): 1

If all answers indicate "Yes," DMAs may be categorized as Type 'C'.

Complete Table C-3 and Table C-4 to identify Type 'B' Self-Retaining Areas and Type 'C' Areas Draining to Self-Retaining Areas.

Table C-3 Type 'B', Self-Retaining Areas

Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retaining Area		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C-4= [C]	Required Retention Depth (inches) [D] = $[B] + \frac{[B]\cdot[C]}{[A]}$
N/A						

Note: Tree well areas can extend well beyond the drip line. The Tree Well area for open top types would include the shallow depressed area at the soil surface. The Tree Well area for Structural Soil Tree Wells or Suspended Pavement Tree Wells includes the area with open-graded gravel or void space over the structural soil or structural cells. Please specify type in this table and WQMP site map. See LID handbook Tree Well factsheet for additional details.

$$\left(\frac{2}{Impervious\ Fraction}\right) : 1$$

(Tributary Area: Self-Retaining Area)

Table C-4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product		Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]	DMA name /ID	[D]	[C]/[D]
N/A							

Note: (See Section 3.3 of SMR WQMP) Ensure that partially pervious areas draining to a Self-Retaining area do not exceed the following ratio:

Step 3.B.1 – Document the use of Green Street Exemption (see Section 3.11 of the WQMP Guidance)

The Regional MS4 Permit specifies that projects that consist of **retrofitting or redevelopment of existing paved alleys, streets, or roads** may be exempted from classification as PDPs if they are designed and constructed in accordance with USEPA Green Streets Guidance. This does not apply for interior roads for PDP projects. For projects with road frontage improvements, Green Street standards can be used in the frontage road right-of-way. The remainder of the project is subject to full WQMP and Hydromodification requirements. See excerpt from Section 3.11 of the WQMP Guidance below:

3.11.4 BMP Sizing Targets for Applicable Green Streets Projects

Applicable green street projects are not required to meet the same sizing requirements for BMPs as other projects, but should attempt to meet a sizing target to the MEP. The following steps are used to size BMPs for applicable Green Streets projects:

1. Delineate drainage areas tributary to BMP locations and compute imperviousness.
2. Determine sizing goal by referring to sizing criteria presented in Section 2.3.2 (V_{BMP}).
3. Attempt to provide the target BMP sizing according to Step 2.
4. If the target criteria cannot be achieved, document the constraints that override the application of BMPs, and provide the largest portion of the sizing criteria that can be reasonably provided given constraints.

Even if BMPs cannot be sized to meet the target sizing criteria, it is still important to design the BMP inlet, energy dissipation, and overflow capacity for the full tributary area to ensure that flooding and scour is avoided. It is strongly recommended that BMPs which are designed to less than their target design volume be designed to bypass peak flows.

Table C-4.1 – Green Streets

DMA Name or ID	Street Name	BMP Sizing Targets Calculations and documenting constraints included in Appendix 6*
N/A		☐ Yes ☐ No
		☐ Yes ☐ No
		☐ Yes ☐ No
		☐ Yes ☐ No
		☐ Yes ☐ No
*WQMP shall not be approved without calculations or documenting constraints for Green Street Exemption.		

Step 3.C – Identify Type 'D' Areas Draining to BMPs

Areas draining to BMPs are those that could not be fully managed through LID Principles (DMA Types A through C) and will instead drain to an LID BMP and/or a Conventional Treatment BMP designed to manage water quality impacts from that area, and Hydromodification where necessary.

Complete Table C-5 to document which DMAs are classified as Areas Draining to BMPs

Table C-5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID Receiving Runoff from DMA
DMA Area C (on-site) , subarea C-15 through C-35 (Residential, and Basin)	BMP C – Biofiltration **Basin C**
DMA Area F (subareas F-5 through F-8) - Residential	BMP F – Biofiltration **Basin E**
DMA Area G (subarea G1 - Residential, Multi Family)	BMP G – Biofiltration **Basin G**

Note: More than one DMA may drain to a single LID BMP; however, one DMA may not drain to more than one BMP.

Section D: Implement LID BMPs

The Regional MS4 Permit requires the use of LID BMPs to provide retention or treatment of the DCV and includes a BMP hierarchy which requires Full Retention BMPs (Priority 1) to be considered before Biofiltration BMPs (Priority 2) and Flow-Through Treatment BMPs and Alternative Compliance BMPs (Priority 3). LID BMP selection must be based on technical feasibility and should be considered early in the site planning and design process. Use this section to document the selection of LID BMPs for each DMA. Note that feasibility is based on the DMA scale and may vary between DMAs based on site conditions.

D.1 Full Infiltration Applicability

An assessment of the feasibility of utilizing full infiltration BMPs is required for all projects, *except where it can be shown that site design LID principles fully retain the DCV (i.e., all DMAs are Type A, B, or C), or where Harvest and Use BMPs fully retain the DCV. Check the following box if applicable:*

☐ Site design LID principles or Tree Wells fully retain the DCV (i.e., all DMAs are Type A, B, or C), (Proceed to Section E).

If the above box remains unchecked, perform a site-specific evaluation of the feasibility of Infiltration BMPs using each of the applicable criteria identified in Chapter 2.3.3 of the SMR WQMP and complete the remainder of Section D.1.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Copermittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the SMR WQMP. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Infiltration Feasibility

Table D-1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the SMR WQMP in Chapter 2.3.3. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D-1 Infiltration Feasibility

Downstream Impacts (SMR WQMP Section 2.3.3.a)		
Does the project site…	**YES**	**NO**
…have any DMAs where infiltration would negatively impact downstream water rights or other Beneficial Uses[3]?		X
If Yes, list affected DMAs:		
Groundwater Protection (SMR WQMP Section 2.3.3.b)		
Does the project site…	**YES**	**NO**
…have any DMAs with industrial, and other land uses that pose a high threat to water quality, which cannot be treated by Bioretention BMPs? Or have DMAs with active industrial process areas?		X
If Yes, list affected DMAs:		
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet horizontally of a water supply well?		X
If Yes, list affected DMAs:		
…have any DMAs that would restrict BMP locations to within a 2:1 (horizontal: vertical) influence line extending from any septic leach line?		X
If Yes, list affected DMAs:		
…have any DMAs been evaluated by a licensed Geotechnical Engineer, or Environmental Engineer, who has concluded that the soils do not have adequate physical and chemical characteristics for the protection of groundwater, and has treatment provided by amended media layers in Bioretention BMPs been considered in evaluating this factor?		X
If Yes, list affected DMAs:		
Public Safety and Offsite Improvements (SMR WQMP Section 2.3.3.c)		
Does the project site…	**YES**	**NO**
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact, such as potential seepage through fill conditions?		X
If Yes, list affected DMAs:		
Infiltration Characteristics For LID BMPs (SMR WQMP Section 2.3.3.d)		
Does the project site…	**YES**	**NO**
…have measured infiltration rates of less than 2.4 inches / hour? Riverside County may allow measure rates as low as 0.8in/hr to support infiltration BMPs, if the Engineer believes infiltration is appropriate and sustainable. Mark no, if this is the case.	X	
If Yes, list affected DMAs: **Average Infiltration Rate = 0.06 inches / hour per Soil Report, poor infiltration rate**		
Cut/Fill Conditions (SMR WQMP Section 2.3.3.e)		
Does the project site…	**YES**	**NO**
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
Other Site-Specific Factors (SMR WQMP Section 2.3.3.f)		
Does the project site…	**YES**	**NO**
…have DMAs where the geotechnical investigation discovered other site-specific factors that would preclude effective and/or safe infiltration?		X
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs that rely solely on infiltration should not be used for those DMAs and you should proceed to the assessment for Biofiltration BMPs below. Biofiltration BMPs that provide partial infiltration may still be feasible and should be

[3] Such a condition must be substantiated by sufficient modeling to demonstrate an impact and would be subject to County of Riverside discretion. There is not a standardized method for assessing this criterion. Water rights evaluations should be site-specific.

assessed in Section D.2. Summarize concerns identified in the Geotechnical Report, if any, that resulted in a "YES" response above in the table below.

Table D-2 Geotechnical Concerns for Onsite Infiltration

Type of Geotechnical Concern	DMAs Feasible (By Name or ID)	DMAs Infeasible (By Name or ID)
Collapsible Soil		
Expansive Soil		
Slopes		
Liquefaction		
Low Infiltration Rate	**Area C, Area F, and Area G**	
Other	Per Infiltration Tests	

D.2 Biofiltration Applicability

This section should document the applicability of biofiltration BMPs for Type D DMAs that are not feasible for full infiltration BMPs. The key decisions to be documented in this section include:

1. Are biofiltration BMPs with partial infiltration feasible?
    a. Biofiltration BMPs must be designed to maximize incidental infiltration via a partial infiltration design unless it is demonstrated that this design is not feasible.
    b. These designs can be used at sites with low infiltration rates where other feasibility factors do not preclude incidental infiltration.

    Document summary in Table D-3.
2. If not, what are the factors that require the use of biofiltration with no infiltration? This may include:
    a. Geotechnical hazards
    b. Water rights issues
    c. Water balance issues
    d. Soil contamination or groundwater quality issues
    e. Very low infiltration rates (factored rates < 0.1 in/hr)
    f. Other factors, demonstrated to the acceptance of the local jurisdiction

    If this applies to any DMAs, then rationale must be documented in Table D-3.
3. Are biofiltration BMPs infeasible?
    a. If yes, then provide a site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee with jurisdiction over the Project site to discuss this option. Proceed below.

Table D-3 Evaluation of Biofiltration BMP Feasibility

DMA ID	Is Partial/ Incidental Infiltration Allowable? (Y/N)	Basis for Infeasibility of Partial Infiltration (provide summary and include supporting basis if partial infiltration not feasible)
BMP – Area C	Y	Biofiltration Basin
BMP – Area F	Y	Biofiltration Basin
BMP – Area G	Y	Biofiltration Basin

Proprietary Biofiltration BMP Approval Criteria

Does the Co-Permittee allow Proprietary BMPs as an equivalent to Biofiltration, if specific criteria is met?

☐ Yes or ☒ No, if no skip to Section F to document your alternative compliance measures.

If the project will use proprietary BMPs as biofiltration BMPs, then this section and Appendix 5 shall be completed to document that the proprietary BMPs are selected in accordance with Section 2.3.6 of the SMR WQMP and County requirements. Proprietary Biofiltration BMPs must meet both of the following approval criteria:

1. Demonstrate equivalency to Biofiltration by completing the BMP Design worksheet and Proprietary Biofiltration Criteria, which is found in Appendix 5, including all supporting documentation, and
2. Obtain Co-Permittee concurrence for the long term Operation and Maintenance Plan for the proprietary BMP. The Co-Permittee has the sole discretion to allow or reject Proprietary BMPs, especially if they will be maintained publically through a CFD, CSA, or L&LMD.

Add additional rows to Table D-4 to document approval criteria are met for each type of BMP proposed.

Table D-4 Proprietary BMP Approval Requirement Summary

Proposed Proprietary Biofiltration BMP	Approval Criteria	Notes/Comments
Insert BMP Name and Manufacturer Here	BMP Design worksheets and Proprietary Biofiltration Criteria are completed in Appendix 5	☐ Yes or ☐ No Insert text here
	Proposed BMP has an active TAPE GULD Certification for the project pollutants of concern[4] or equivalent 3rd party demonstrated performance.	☐ Yes or ☐ No Insert text here
	Is there any media or cartridge required to maintain the function of the BMP sole-sourced or proprietary in any way? If yes, obtain explicit approval by the Agency. Potentially full replacement costs to a non-proprietary BMP needs to be considered.	☐ Yes or ☐ No If yes, provide the date of concurrence from the Co-Permittee. Insert date here

[4] Use Table F-1, F-2, and F-3 to identify and document the pollutants of concern and include these tables in Appendix 5.

	☐ The BMP includes biological features including vegetation supported by engineered or other growing media.	Describe features here.

D.3 Feasibility Assessment Summaries

From the Infiltration, Biofiltration with Partial Infiltration and Biofiltration with No Infiltration Sections above, complete Table D-5 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D-5 LID Prioritization Summary Matrix

DMA Name/ID	LID Principles or Tree Wells	LID BMP Hierarchy			No LID (Alternative Compliance)
		1. Infiltration	2. Biofiltration with Partial Infiltration*	3. Biofiltration with No Infiltration*	
BMP – Area C	☒	☐	☒	☐	☐
BMP – Area F	☐	☐	☒	☐	☐
BMP – Area G	☐	☐	☒	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

*Includes Proprietary Biofiltration, if accepted by the Co-Permittee.

For those DMAs where LID BMPs are not feasible, provide a narrative in Table D-6 below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section F below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

This is based on the clarification letter titled "San Diego Water Board's Expectations of Documentation to Support a Determination of Priority Development Project Infiltration Infeasibility" (April 28, 2017, Via email from San Diego Regional Water Quality Control Board to San Diego County Municipal Storm Water Copermittees[5]).

Table D-6 Summary of Infeasibility Documentation

Question	Narrative Summary (include reference to applicable appendix/attachment/report, as applicable)
a) When in the entitlement process did a geotechnical engineer analyze the site for infiltration feasibility?	N/A
b) When in the entitlement process were other investigations conducted (e.g., groundwater quality, water rights) to evaluate infiltration feasibility?	
c) What was the scope and results of testing, if conducted, or rationale	

[5] http://www.projectcleanwater.org/download/pdp-infiltration-infeasibility/

for why testing was not needed to reach findings?	
d) What public health and safety requirements affected infiltration locations?	
e) What were the conclusions and recommendations of the geotechnical engineer and/or other professional responsible for other investigations?	
f) What was the history of design discussions between the permittee and applicant for the proposed project, resulting in the final design determination related locations feasible for infiltration?	
g) What site design alternatives were considered to achieve infiltration or partial infiltration on site?	
h) What physical impairments (i.e., fire road egress, public safety considerations, utilities) and public safety concerns influenced site layout and infiltration feasibility?	
i) What LID Principles (site design BMPs) were included in the project site design?	

D.4 LID BMP Sizing

Each LID BMP must be designed to ensure that the DCV will be captured by the selected BMPs with no discharge to the storm drain or surface waters during the DCV size storm. Infiltration BMPs must at minimum be sized to capture the DCV to achieve pollutant control requirements.

Biofiltration BMPs must at a minimum be sized to:

- Treat 1.5 times the DCV not reliably retained on site using a volume-base or flow-based sizing method, or
- Include static storage volume, including pore spaces and pre-filter detention volume, at least 0.75 times the portion of the DCV not reliably retained on site.

First**,** calculate the DCV for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using the methods included in Section 3 of the LID BMP Design Handbook. Utilize the worksheets found in the LID BMP Design Handbook or consult with the Copermittee to assist you in correctly sizing your LID BMPs. Use Table D-7 below to document the DCV each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D-7 DCV Calculations for LID BMPs

DMA Type/ID	DMA (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* *Biofiltration Basin C*		
	[A]		[B]	[C]	[A] x [C]			
DMA Area C - subarea C15 thru C-35 residential (86.5 ac)	*3,767,940*	*Mixed Surface*	*0.69*	*0.48*	*1,808,611*	*Design Storm Depth (in)*	*DCV, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T = Σ[A] 3,767,940				Σ= [D] 1,808,611	[E] 0.57	$[F] = \frac{[D]x[E]}{12}$ 87,919	[G] ***93,310***

[B], [C] is obtained as described in Section 2.6.1.b of the SMR WQMP
[E] is obtained from Exhibit A in the SMR WQMP
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6.

DMA Type/ID	DMA (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* *Biofiltration Basin C*		
	[A]		[B]	[C]	[A] x [C]			
Area C-26 Basin (5.30 ac)	*230,868*	*Ornamental Landscape*	*0.10*	*0.11*	*25,395*	*Design Storm Depth (in)*	*DCV, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T = Σ[A] 230,868				Σ= [D] 25,395	[E] 0.57	$[F] = \frac{[D]x[E]}{12}$ 1,154	[G] ***93,310***

DMA Type/ID	DMA (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* *Biofiltration Basin E (for DMAs F-5 thru F-8)*		
	[A]		[B]	[C]	[A] x [C]			
DMA Area F - subareas F-5 thru F-8 (16.4 ac)	*714,384*	*Mixed Surface*	*0.75*	*0.54*	*385,767*	*Design Storm Depth (in)*	*DCV, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T = Σ[A] 714,384				Σ= [D] 385,767	[E] 0.57	$[F] = \frac{[D]x[E]}{12}$ 18,455	[G] ***18,500***

DMA Type/ID	DMA (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* *Biofiltration Basin G*		
	[A]		[B]	[C]	[A] x [C]			
DMA Area G - subarea G-1 (5.5 ac)	*241,322*	*Mixed Surface*	*0.80*	*0.60*	*162,043*	*Design Storm Depth (in)*	*DCV, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$ 241,322				Σ= [D] 162,043	[E] 0.57	$[F] = \frac{[D]x[E]}{12}$ 6,837	[G] ***7,700***

Complete Table D-8 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. You can add rows to the table as needed. Alternatively, the Santa Margarita Hydrology Model (SMRHM) can be used to size LID BMPs to address the DCV and, if applicable, to size Hydrologic Control BMPs to meet the Hydrologic Performance Standard described in the SMR WQMP, as identified in Section E.

Table D-8 LID BMP Sizing

BMP Name / ID	DMA No.	BMP Type / Description	Design Capture Volume (ft^3)	Proposed Volume (ft^3)
BMP C	Area C (on-site), subarea C-15 thru C-35 (Residential, and Basin)	Biofiltration Basin C	87,919	93,310
BMP F	Area F - subareas F-5 thru F-8	Biofiltration Basin E	18,455	18,500
BMP G	Area G - subarea G-1	Biofiltration Basin G	6,837	7,700

If bioretention will include a capped underdrain, then include sizing calculations demonstrating that the BMP will meet infiltration sizing requirements with the underdrain capped and also meet biofiltration sizing requirements if the underdrain is uncapped.

Section E: Implement Hydrologic Control BMPs and Sediment Supply BMPs

See Appendix 7 for additional required information.

If a completed Table 1.2 demonstrates that the project is exempt from Hydromodification Performance Standards, specify N/A and proceed to Section G.

☐ N/A Project is Exempt from Hydromodification Performance Standards.

If a PDP is not exempt from hydromodification requirements than the PDP must satisfy the requirements of the performance standards for hydrologic control BMPs and Sediment Supply BMPs. The PDP may choose to satisfy hydrologic control requirements using onsite or offsite BMPs (i.e. Alternative Compliance). Sediment supply requirements cannot be met via alternative compliance. If N/A is not selected above, select one of the two options below and complete the applicable sections.

☒ Project is Not Hydromodification Exempt and chooses to implement Hydrologic Control and Sediment Supply BMPs Onsite (complete Section E).

☐ Project is Not Hydromodification Exempt and chooses to implement Hydrologic Control Requirements using Alternative Compliance (complete Section F). Selection of this option must be approved by the Copermittee.

E.1 Hydrologic Control BMP Selection

Capture of the DCV and achievement of the Hydrologic Performance Standard may be met by combined and/or separate structural BMPs. The user should consider the full suite of Hydrologic Control BMPs to manage runoff from the post-development condition and meet the Hydrologic Performance Standard identified in this section.

For the Preliminary WQMP, in lieu of preparing detailed routing calculations, the basin size may be estimated as the difference in volume between the pre-development and post-development hydrograph for the 10-year 24-hour storm event plus the Vbmp. This does not relieve the engineer of the responsibility for meeting the full Hydrologic Control requirements during final design.

The Hydrologic Performance Standard consists of matching or reducing the flow duration curve of post-development conditions to that of pre-existing, naturally occurring conditions, for the range of geomorphically significant flows (the low flow threshold runoff event up to the 10-year runoff event). 10% of the 2-year runoff event can be used for the low flow threshold without any justification. Higher low flow thresholds can be used with site-specific analysis, see Section 2.6.2.b of the WQMP guidance document. Select each of the hydrologic control BMP types that are applied to meet the above performance standard on the site.

☐ LID principles as defined in Section 3.2 of the SMR WQMP, including Tree Wells.

☒ Structural LID BMPs that may be modified or enlarged, if necessary, beyond the DCV.

☐ Structural Hydrologic Control BMPs that are distinct from the LID BMPs above. The LID BMP Design Handbook provides information not only on Hydrologic Control BMP design, but also on BMP design to meet the combined LID requirement and Hydrologic Performance Standard. The Handbook specifies the type of BMPs that can be used to meet the Hydrologic Performance Standard.

E.2 Hydrologic Control BMP Sizing

Hydrologic Control BMPs must be designed to ensure that the flow duration curve of the post-development DMA will not exceed that of the pre-existing, naturally occurring, DMA for the range of geomorphically significant flows. Using SMRHM, (or another acceptable continuous simulation model if approved by the Copermittee) the applicant shall demonstrate that the performance of the Hydrologic Control BMPs complies with the Hydrologic Performance Standard. Complete Table E-1 below and identify, for each DMA, the type of Hydrologic Control BMP, if the SMRHM model confirmed the management (Identified as "passed" in SMRHM), the total volume capacity of the Hydrologic Control BMP, the Hydrologic Control BMP footprint at top floor elevation, and the drawdown time of the Hydrologic Control BMP. SMRHM summary reports should be documented in Appendix 7. Refer to the SMRHM Guidance Document for additional information on SMRHM. You can add rows to the table as needed.

Table E-1 Hydrologic Control BMP Sizing

BMP Name / ID	DMA No.	BMP Type / Description	SMRHM * Passed	BMP Volume (ac-ft)	BMP Footprint (ac)	Drawdown time (hr)
BMP – C	**Area C** (on-site), subarea C-15 thru C-35	Extended / Detention Basin C	☒	DCV = 2.14 Basin C	5.3	Less than 72 hours
BMP – F	**Area F** - subareas F-5 thru F-8	Bio-filtration Basin E	☒	DCV=0.26 Basin E	0.7	Less than 72 hours
BMP – G	**Area G** - subarea G-1	Bio-filtration / Detention Basin G	☒	DCV = 0.176 Basin G	0.25	Less than 72 hours

**Or other continuous simulation model, compliant with the WQMP and Permit. If Tree Wells are proposed for some or all of the project, check the box for Tree Wells in Section E.1 and enter each Tree Well DMA in Table E-1 above for the BMP Name/ID, DMA No. and BMP Type/Description. For Tree Wells, leave SMRHM* Passed Column and the columns to the left blank.*

If a bioretention BMP with capped underdrain is used and hydromodification requirements apply, then sizing calculations must demonstrate that the BMP meets flow duration control criteria with the underdrain capped and uncapped. Both calculations must be included.

E.3 Implement Sediment Supply BMPs

The sediment supply performance standard applies to PDPs for which hydromodification applied that have the potential to impact Potential Critical Coarse Sediment Yield Areas. Refer to Exhibit G-1 of the WQMP Guidance Document to determine if there are onsite Potential Critical Coarse Sediment Yield Areas (based on on-going WMAA analysis) or Potential Sediment Source Areas (sites added through the Regional Board review process). Select one of the two options below and include the Potential Critical Coarse Sediment Yield Area Exhibit showing your project location in Appendix 7.

☒ There are no mapped Potential Critical Coarse Sediment Yield Areas or Potential Sediment Source Areas on the site. Include a copy of Exhibit G - CCSY & PSS Areas in Appendix 7, with the project location marked. If the project is outside of the "Potential Critical Coarse Sediment Yield Areas and Potential Sediment Source Areas" then check this box. The Sediment Supply Performance Standard is met with no further action is needed.

☐ There are mapped Potential Critical Coarse Sediment Yield Areas or Potential Sediment Source Areas on the site, the Sediment Supply Performance Standard will be met through Option 1 (E.3.1) or Option 2 (E.3.2) below.

☐ E.3.1 Option 1: Avoid Potential Critical Coarse Sediment Yield Areas and Potential Sediment Source Areas

The simplest approach for complying with the Sediment Supply Performance Standard is to avoid impacts to areas identified as Potential Critical Coarse Sediment Yield Areas or Potential Sediment Supply Areas. If a portion of PDP is identified as a Potential Critical Coarse Sediment Yield Area or a Potential Sediment Source Area, that PDP may still achieve compliance with the Sediment Supply Performance Standards if Potential Critical Coarse Sediment Yield Areas and Potential Sediment Supply Areas are avoided, i.e. areas are not developed and thereby delivery of Critical Coarse Sediment to the receiving waters is not impeded by site developments.

Provide a narrative describing how the PDP has avoided impacts to Potential Critical Coarse Sediment Yield Areas and/or Potential Sediment Source Areas below.

Insert narrative description here

If it is not feasible to avoid these areas, proceed to Option 2 to complete a Site-Specific Critical Coarse Sediment Analysis.

☐ E.3.2 Option 2: Site-Specific Critical Coarse Sediment Analysis

Perform a stepwise assessment to ensure the pre-project source(s) of Critical Coarse Sediment (i.e., Bed Sediment Supply) is maintained:

Step 1: Identify if the site is an actual verified Critical Coarse Sediment Yield Area supplying Bed Sediment Supply to the receiving channel

☐ **Step 1.A** – Is the Bed Sediment of onsite streams similar to that of receiving streams?

Rate the similarity: ☐ High
☐ Medium
☒ Low

Results from the geotechnical and sieve analysis to be performed both onsite and in the receiving channel should be documented in Appendix 7. Of particular interest, the results of the sieve analysis, the soil erodibility factor, a description of the topographic relief of the project area, and the lithology of onsite soils should be reported in Appendix 7.

☐ **Step 1.B** – Are onsite streams capable of delivering Bed Sediment Supply from the site, if any, to the receiving channel?

Rate the potential:

☐ High
☐ Medium
☒ Low

Results from the analyses of the sediment delivery potential to the receiving channel should be documented in Appendix 7 and identify, at a minimum, the Sediment Source, the distance to the receiving channel, the onsite channel density, the project watershed area, the slope, length, land use, and rainfall intensity.

☐ **Step 1.C** – Will the receiving channel adversely respond to a change in Bed Sediment Load?

Rate the need for bed sediment supply:

☐ High
☐ Medium
☒ Low

Results from the in-stream analysis to be performed both onsite should be documented in Appendix 7. The analysis should, at a minimum, quantify the bank stability and the degree of incision, provide a gradation of the Bed Sediment within the receiving channel, and identify if the channel is sediment supply-limited.

☐ **Step 1.D** – Summary of Step 1

Summarize in Table E.3 the findings of Step 1 and associate a score (in parenthesis) to each step. The sum of the three individual scores determines if a stream is a significant contributor to the receiving stream.

- Sum is equal to or greater than eight - Site is a significant source of sediment bed material – all on-site streams must be preserved or by-passed within the site plan. The applicant shall proceed to Step 2 for all onsite streams.
- Sum is greater than five but lower than eight. Site is a source of sediment bed material – some of the on-site streams must be preserved (with identified streams noted). The applicant shall proceed to Step 2 for the identified streams only.
- Sum is equal to or lower than five. Site is not a significant source of sediment bed material. The applicant may advance to Section F.

Table E-2 Triad Assessment Summary

Step	Rating			Total Score
1.A	☐ High (3)	☐ Medium (2)	☒ Low (1)	1
1.B	☐ High (3)	☐ Medium (2)	☒ Low (1)	1
1.C	☐ High (3)	☐ Medium (2)	☒ Low (1)	1
Significant Source Rating of Bed Sediment to the receiving channel(s)				

Step 2: Avoid Development of Critical Coarse Sediment Yield Areas, Potential Sediment Sources Areas, and Preserve Pathways for Transport of Bed Sediment Supply to Receiving Waters

Onsite streams identified as a actual verified Critical Coarse Sediment Yield Areas should be avoided in the site design and transport pathways for Critical Coarse Sediment should be preserved

Check those that apply:

☐ The site design does avoid all onsite channels identified as actual verified Critical Coarse Sediment Yield Areas ***AND***

☐ The drainage design bypasses flow and sediment from onsite upstream drainages identified as actual verified Critical Coarse Sediment Yield Areas to maintain Critical Coarse Sediment supply to receiving waters

(If both are yes, the applicant may disregard subsequent steps of Section E.3 and directly advance directly to Section G)

Or -

Provide in Appendix 7 a site map that identifies all onsite channels and highlights those onsite channels that were identified as a Significant Source of Bed Sediment. The site map shall demonstrate, if feasible, that the site design avoids those onsite channels identified as a Significant Source of Bed Sediment. In addition, the applicant shall describe the characteristics of each onsite channel identified as a Significant Source of Bed Sediment. If the design plan cannot avoid the onsite channels, please provide a rationale for each channel individually.

The site map shall demonstrate that the drainage design bypasses those onsite channels that supply Critical Coarse Sediment to the receiving channel(s). In addition, the applicant shall describe the characteristics of each onsite channel identified as an actual verified Critical Coarse Sediment Yield Area.

Identified Channel #1 - Insert narrative description here

Identified Channel #2 - Insert narrative description here

☐ The site design **does NOT avoid** all onsite channels identified as actual verified Critical Coarse Sediment Yield Areas

OR

☐ The project blocks the potential for Critical Coarse Sediment from migrating to receiving waters.

(If either of these are the case, the applicant shall continue completing this section).

E.3.3 Sediment Supply BMPs to Result in No Net Impact to Downstream Receiving Waters

If impacts to Critical Coarse Sediment Yield Areas cannot be avoided, sediment supply BMPs must be implemented such there is no net impact to receiving waters. Sediment supply BMPs may consist of approaches that permit flux of bed sediment supply from Critical Coarse Sediment Yield Areas within the project boundary. This approach is subject to acceptance by the County of Riverside. It may require extensive documentation and analysis by qualified professionals to support this demonstration.

Appendix H of the San Diego Model BMP Design Manual provides additional information on site-specific investigation of Critical Coarse Sediment Supply areas.

http://www.projectcleanwater.org/download/2018-model-bmp-design-manual/

If applicable, insert narrative description here

Documentation of sediment supply BMPs should be detailed in Appendix 7.

Section F: Alternative Compliance

Alternative Compliance may be used to achieve compliance with pollutant control and/or hydromodification requirements for a given PDP. Alternative Compliance may be used under two scenarios, check the applicable box if the PDP is proposing to use Alternative Compliance to satisfy all or a portion of the Pollutant Control and/or Hydrologic Control requirements (but not sediment supply requirements)

☐ If it is not feasible to fully implement Infiltration or Biofiltration BMPs at a PDP site, Flow-Through Treatment Control BMPs may be used to treat pollutants contained in the portion of DCV not reliably retained on site and Alternative Compliance measures must also be implemented to mitigate for those pollutants in the DCV that are not retained or removed on site prior to discharging to a receiving water.

☐ Alternative Compliance is selected to comply with either pollutant control or hydromodification flow control requirements even if complying with these requirements is potentially feasible on-site. If such voluntary Alternative Compliance is implemented, Flow-Through Treatment Control BMPs must still be used to treat those pollutants in the portion of the DCV not reliably retained on site prior to discharging to a receiving water.

Refer to Section 2.7 of the SMR WQMP and consult the Local Jurisdiction for currently available Alternative Compliance pathways. Coordinate with the Copermittee if electing to participate in Alternative Compliance and complete the sections below to document implementation of the Flow-Through BMP component of the program.

F.1 Identify Pollutants of Concern

The purpose of this section is to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs and to document compliance and.

Utilize Table A-1 from Section A, which noted your project's Receiving Waters, to identify impairments for Receiving Waters (including downstream receiving waters) by completing Table F-1. Table F-1 includes the watersheds identified as impaired in the Approved 2010 303(d) list; check box corresponding with the PDP's receiving water. The most recent 303(d) lists are available from the State Water Resources Control Board website:
https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml).https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml.

Table F-1 Summary of Approved 2010 303(d) listed waterbodies and associated pollutants of concern for the Riverside County SMR Region and downstream waterbodies.

	Water Body	Nutrients[1]	Metals[2]	Toxicity	Bacteria and Pathogens	Pesticides and Herbicides	Sulfate	Total Dissolved Solids
☐	De Luz Creek	X	X				X	
☐	Long Canyon Creek		X		X	X		
☒	Murrieta Creek	X	X	X		X		
☐	Redhawk Channel	X	X		X	X		X
☐	Santa Gertudis Creek	X	X		X	X		
☐	Santa Margarita Estuary	X						
☐	Santa Margarita River (Lower)	X			X			
☒	Santa Margarita River (Upper)	X		X				
☐	Temecula Creek	X	X	X		X		X
☒	Warm Springs Creek	X	X		X	X		

[1] Nutrients include nitrogen, phosphorus and eutrophic conditions caused by excess nutrients.

[2] Metals includes copper, iron, and manganese.

Use Table F-2 to identify the pollutants identified with the project site. Indicate the applicable PDP Categories and/or Project Features by checking the boxes that apply. If the identified General Pollutant Categories are the same as those listed for your Receiving Waters, then these will be your Pollutants of Concern; check the appropriate box or boxes in the last row.

Table F-2 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)		General Pollutant Categories									
		Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease	Total Dissolved Solids	Sulfate
☒	Detached Residential Development	P	N	P	P	N	P	P	P	N	N
☐	Attached Residential Development	P	N	P	P	N	P	P	P(2)	N	N
☐	Commercial/Industrial Development	P(3)	P(7)	P(1)	P(1)	P	P(1)	P	P	N	N
☐	Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P	N	N
☐	Restaurants (>5,000 ft^2)	P	N	N	P(1)	N	N	P	P	N	N
☐	Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P	N	N
☐	Parking Lots (>5,000 ft^2)	P(6)	P(7)	P(1)	P(1)	P(4)	P	P	P	N	N
☐	Streets, Highways, and Freeways	P(6)	P(7)	P(1)	P(1)	P(4)	P	P	P	N	N
☐	Retail Gasoline Outlets	N	P(7)	N	N	P(4)	N	P	P	N	N
Project Priority Pollutant(s) of Concern		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste products; otherwise not expected

(4) Including petroleum hydrocarbons

(5) Including solvents

(6) Bacterial indicators are routinely detected in pavement runoff

(7) A potential source of metals, primarily copper and zinc. Iron, magnesium, and aluminum are commonly found in the environment and are commonly associated with soils, but are not primarily of anthropogenic stormwater origin in the municipal environment.

F.2 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential Pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must be selected to address the Project Priority Pollutants of Concern (identified above) and meet the acceptance criteria described in Section 2.3.7 of the SMR WQMP. Documentation of acceptance criteria must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table F-3 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
N/A		

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.
[2] Cross Reference Table E.1 above to populate this column.
[3] As documented in a Copermittee Approved Study and provided in Appendix 6.

F.3 Sizing Criteria

Utilize Table F-4 below to appropriately size flow-through BMPs to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.1 of the SMR WQMP for further information.

Table F-4 Treatment Control BMP Sizing

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*	
	[A]		[B]	[C]	[A] x [C]		
N/A							
						Design Storm (in)	*Design Flow Rate (cfs)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{[G]}$

[B], [C] is obtained as described in Section 2.6.1.b from the SMR WQMP
[E] either 0.2 inches or 2 times the 85th percentile hourly rainfall intensity
[G] = 43,560,.

F.4 Hydrologic Performance Standard – Alternative Compliance Approach

Alternative compliance options are only available if the governing Copermittee has acknowledged the infeasibility of onsite Hydrologic Control BMPs and approved an alternative compliance approach. See Section 3.5 and 3.6 of the SMR WQMP.

Select the pursued alternative and describe the specifics of the alternative:

☐ Offsite Hydrologic Control Management within the same channel system

Insert narrative description here

☐ In-Stream Restoration Project

Insert narrative description here

For Offsite Hydrologic Control BMP Option

Each Hydrologic Control BMP must be designed to ensure that the flow duration curve of the post-development DMA will not exceed that of the pre-existing, naturally occurring, DMA by more than ten percent over a one-year period. Using SMRHM, the applicant shall demonstrate that the performance of each designed Hydrologic Control BMP is equivalent with the Hydrologic Performance Standard for onsite conditions. Complete Table F-5 below and identify, for each Hydrologic Control BMP, the equivalent DMA the Hydrologic Control BMP mitigates, that the SMRHM model passed, the total volume capacity of the BMP, the BMP footprint at top floor elevation, and the drawdown time of the BMP. SMRHM summary reports for the alternative approach should be documented in Appendix 7. Refer to the SMRHM Guidance Document for additional information on SMRHM. You can add rows to the table as needed.

Table F-5 Offsite Hydrologic Control BMP Sizing

BMP Name / Type	Equivalent DMA (ac)	SMRHM Passed	BMP Volume (ac-ft)	BMP Footprint (ac)	Drawdown time (hr)
N/A		☐			
		☐			
		☐			
		☐			

For Instream Restoration Option

Attach to Appendix 7 the technical report detailing the condition of the receiving channel subject to the proposed hydrologic and sediment regimes. Provide the full design plans for the in-stream restoration project that have been approved by the Copermittee. Utilize the San Diego Regional Water Quality Equivalency Guidance Document.

Section G: Implement Trash Capture BMPs

The Santa Margarita Regional Board has required Full Trash Capture compliance thru Order No. R9-2017-007. For the Santa Margarita Watershed, the County is requiring Track 1 full trash capture compliance for projects proposing the following uses as part of their development after **December 3, 2018**.

- High-density residential: all land uses with at least ten (10) developed dwelling units/acre.
- Industrial: land uses where the primary activities on the developed parcels involve product manufacture, storage, or distribution (e.g., manufacturing businesses, warehouses, equipment storage lots, junkyards, wholesale businesses, distribution centers, or building material sales yards).
- Commercial: land uses where the primary activities on the developed parcels involve the sale or transfer of goods or services to consumers (e.g., business or professional buildings, shops, restaurants, theaters, vehicle repair shops, etc.).
- Mixed urban: land uses where high-density residential, industrial, and/or commercial land uses predominate collectively (i.e., are intermixed).
- Public transportation stations: facilities or sites where public transit agencies' vehicles load or unload passengers or goods (e.g., bus stations and stops).

Riverside County Maintenance is generally supportive of United Storm Water – Connector Pipe Screens or equivalent. Equivalent systems or alternative designs shall be on the State of California Approved Trash Capture Device List and requires approval by the Transportation Department for maintenance. Riverside County is developing Trash Capture Device Standards, which are expected to be added to the Transportation Plan Check Policies and Guidelines when available. Design calculations are not expected to be required if the project uses standard sizes per the County's Trash Capture Device Standards. Until the Trash Capture Device Standards are available and the project uses standard sizes, the project shall complete the following tables and furnish hydraulic analysis calculating the flowrate in the catch basin does not exceed the flowrate capacity of the trash capture device in a fully clogged condition.

Trash Capture BMPs may be applicable to Type 'D' DMAs, as defined in Section 2.3.4 of the SMR WQMP. Trash Capture BMPs are designed to treat Q_{TRASH}, the runoff flow rate generated during the 1-year 1-hour precipitation depth. Utilize Table G-1 to size Trash Capture BMP. Refer to Table G-2 to determine the Trash Capture Design Storm Intensity (E).

Table G-1 Sizing Trash Capture BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Enter BMP Name / Identifier Here	
	[A]		[B]	[C]	[A] x [C]		
DMA Area G, subarea G-1 (5.5 ac)	*270,072*	*Multi-family*	*0.80*	*0.60*	*162,043*	*Trash Capture Design Storm Intensity (in)*	*Trash Capture Design Flow Rate (cubic feet or cfs)*
	$A_T = \Sigma[A]$ 270,072				$\Sigma = [D]$ 162,043	[E] 0.47	$[F] = \frac{[D]x[E]}{[G]}$ ***1.75***

[B], [C] is obtained as described in Section 2.6.1.b from the SMR WQMP
[G] = 43,560

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Enter BMP Name / Identifier Here	
	[A]		[B]	[C]	[A] x [C]		
DMA Area F, subareas F-5 thru F-8 (16.4 x ac)	*714,384*	*Single family*	*0.75*	*0.54*	*385,767*	*Trash Capture Design Storm Intensity (in)*	*Trash Capture Design Flow Rate (cubic feet or cfs)*
	$A_T = \Sigma[A]$ 714,384				$\Sigma = [D]$ 385,767	[E] 0.47	$[F] = \frac{[D]x[E]}{[G]}$ ***4.16***

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Enter BMP Name / Identifier Here	
	[A]		[B]	[C]	[A] x [C]		
DMA Area C (on-site), subarea C-15	*3,76 7,940*	*Single-family*	*0.69*	*0.48*	*1,808,611*	*Trash Capture Design Storm Intensity (in)*	*Trash Capture Design Flow Rate (cubic feet or cfs)*

thru C-35 Res. (91.8 ac)							
	$A_T = \Sigma[A]$ 3,767, 940				$\Sigma = [D]$ 1,808,611	[E] 0.47	$[F] = \frac{[D]x[E]}{[G]}$ ***19.51***

Table G-2 Approximate precipitation depth/intensity values for calculation of the Trash Capture Design Storm

City	1-year 1-hour Precipitation Depth/Intensity (inches/hr)
Murrieta	0.47
Temecula	0.50
Wildomar	0.37

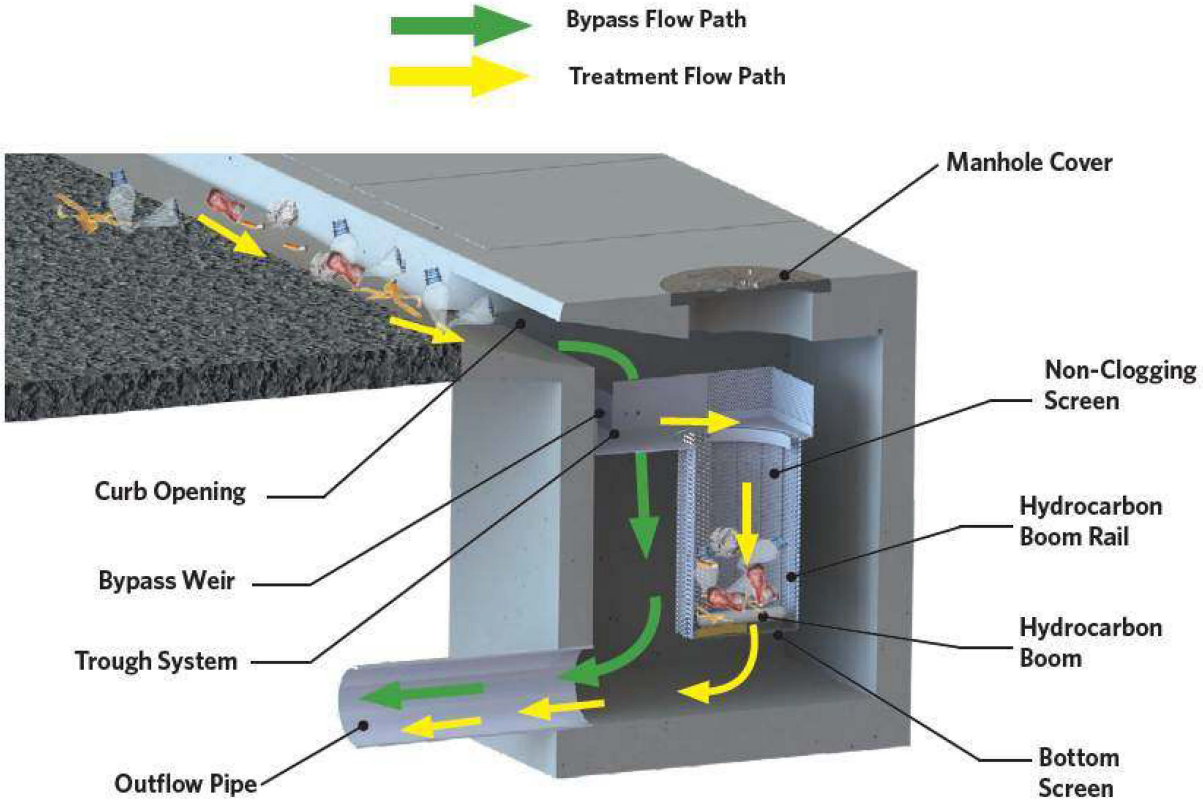
Use Table G-3 to summarize and document the selection and sizing of Trash Capture BMPs.

Table G-3 Trash Capture BMPs

BMP Name / ID	DMA No(s)	BMP Type / Description	Required Trash Capture Flowrate (cfs)	Provided Trash Capture Flowrate (cfs)[1]
BMP - C	DMA Area C (on-site), subarea C-15 thru C-15	Catch Basin Insert (16-ea)	Total 13.94 cfs 0.87 cfs/ea	>2.85 cfs/ea See brochure below
BMP - F	DMA Area F - subareas F-4 thru F-8	Catch Basin Insert (5-ea)	Total 2.60 cfs 0.52 cfs/ea	>2.85 cfs/ea See brochure below
BMP - G	DMA Area G - subarea G-1	Catch Basin Insert (TBD)	Total 1.75 cfs 1.75 cfs/ea	>2.85 cfs/ea See brochure below

[1] For connector pipe screens, the Trash Capture Flowrate shall be based on a fully clogged condition for the screen, where the water level is at the top of the screen. Then determined the Flowrate based on weir equation (Qweir = C x L x H^(2/3), where C = 3.4). The height used to calculate the weir flow rate shall maintain a 6" freeboard to the invert of the catch basin opening at the road. This analysis is meant to replicate the hydraulic analysis used in the County's Full Trash Capture Device Standards.

OPERATION



APPLICATIONS

- Parking Lots
- Roadways

SPECIFICATIONS

MODEL #	TREATMENT FLOW CAPACITY (cfs)	BYPASS FLOW (cfs)
BIO-CURB-FULL	2.85	UNLIMITED

Note: Treatment flow rate limited to the weir capacity - actual flow rates of the filter basket is greater than 2.85 cfs.
Various depth filter baskets available.

Section H: Source Control BMPs

Section H need only be completed at the Preliminary WQMP phase if source control is critical to the project successfully handling the anticipated pollutants.

Source Control BMPs include permanent, structural features that may be required in your Project plans, such as roofs over and berms around trash and recycling areas, and Operational BMPs, such as regular sweeping and "housekeeping," that must be implemented by the site's occupant or user. The Maximum Extent Practicable (MEP) standard typically requires both types of BMPs. In general, Operational Source Control BMPs cannot be substituted for a feasible and effective Structural Source Control BMP. Complete checklist below to determine applicable Source Control BMPs for your site.

Project-Specific WQMP Source Control BMP Checklist

All development projects must implement Source Control BMPs. Source Control BMPs are used to minimize pollutants that may discharge to the MS4. Refer to Chapter 3 (Section 3.8) of the SMR WQMP for additional information. Complete Steps 1 and 2 below to identify Source Control BMPs for the project site.

Step 1: Identify Pollutant Sources

Review project site plans and identify the applicable pollutant sources. "Yes" indicates that the pollutant source is applicable to project site. "No" indicates that the pollutant source is not applicable to project site.

☒ Yes ☐ No	Storm Drain Inlets		☐ Yes ☒ No	Outdoor storage areas	
☒ Yes ☐ No	Floor Drains		☐ Yes ☒ No	Material storage areas	
☐ Yes ☒ No	Sump Pumps		☐ Yes ☒ No	Fueling areas	
☒ Yes ☐ No	Pets Control/Herbicide Application		☐ Yes ☒ No	Loading Docks	
☒ Yes ☐ No	Food Service Areas		☐ Yes ☒ No	Fire Sprinkler Test/Maintenance water	
☒ Yes ☐ No	Trash Storage Areas		☒ Yes ☐ No	Plazas, Sidewalks and Parking Lots	
☐ Yes ☒ No	Industrial Processes		☒ Yes ☐ No	Pools, Spas, Fountains and other water features	
☐ Yes ☒ No	Vehicle and Equipment Cleaning and Maintenance/Repair Areas				

Step 2: Required Source Control BMPs

List each Pollutant source identified above in column 1 and fill in the corresponding Structural Source Control BMPs and Operational Control BMPs by referring to the Stormwater Pollutant Sources/Source Control Checklist included in Appendix 8. The resulting list of structural and operational source control BMPs must be implemented as long as the associated sources are present on the project site. Add additional rows as needed.

Pollutant Source	Structural Source Control BMP	Operational Source Control BMP
Roadways	Provide storm drain stenciling and signage (S1)	Education for property owners, tenants and occupants (N1) Streets and sidewalks will be swept regularly to prevent accumulation or litter and debris. Debris from pressure washing will be collected to prevent entry into the storm drain.

		Washwater containing any cleaning agent or degreaser will be collected and discharge to the sanitary sewer not to a storm drain.
Residential Lots	Roofs designed to runoff into adjoining landscaping. Driveways of minimal widths. Roofing, gutters, and trim will not be made of copper or other unprotected metals that may leach into runoff.	Activity Restrictions (N2)
Refuse and Trash Storage Areas. Locations are shown later on Park Site.	Trash container storage areas shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements from the surrounding area, and screened or walled to prevent off-site transport of trash. Trash dumpsters (containers) shall be leak proof and have attached covers or lids. Trash enclosures shall be roofed per MJPA standards and the details on the PWQMP Exhibit in Appendix 1. Trash compactors shall be roofed and set on a concrete pad per City's standards. The pad shall be a minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line. Connection of trash area drains to the MS4 is prohibited. See CASQA SD-32 BMP Fact Sheets in Appendix 10 for additional information.	Inspect monthly. Check weekly and have trash containers emptied when full and hauled away on a regular basis. Maintain trash receptacles and enclosures in good working order. Post "No Hazardous Materials" signs. Inspect and pick up litter and debris on a daily basis. See CASQA SD-32 BMP Fact Sheets in Appendix 10 for additional information. Clean up spills immediately. See CASQA SC-10 BMP Fact Sheets and Emergency Response/Contingency Plan in Appendix 10 for additional information.
Rooftop Equipment Roofing, gutters, and trim.	Rooftop equipment with potential to produce pollutants will be roofed and/or have secondary containment. Roofing, gutters, and trim will not be made of copper or other	

	unprotected metals that may leach into runoff.	
Man-made & irrigated slopes and landscaped areas	Protect slopes and channels (S5) Hillside Landscaping (S12)	Irrigation System and Landscape Management (N3)
	Irrigation systems and landscape design should follow as a guide the specifications and recommendations of the Water Conservation Act of 2006, AB1881 (Laird) and conform to the standards and requirements of the County' landscape requirements. Irrigation systems shall employ control systems and be designed to conserve water. The landscape design shall incorporate native and drought tolerant vegetation with low irrigation requirements. See CASQA SD-10 and SD-12 BMP Fact Sheets in and other landscape literature in WQMP for additional information.	Performed during design phase.
	Irrigation and landscape maintenance should be performed on a regular basis throughout the year. See CASQA SC-41 or SD-10 and SD-12BMP Fact Sheets in WQMP for additional information.	Inspect landscape areas twice annually (before and after the rainy season) and the irrigation system quarterly for proper functioning. Maintenance should be performed every 2 weeks or as needed. Landscape maintenance should include mowing, weeding, trimming, removal of trash & debris, repair of erosion, re-vegetation, and removal of cut & dead vegetation. Irrigation maintenance should include the repair of leaky or broken sprinkler heads, the maintaining of timing apparatus accuracy, and the maintaining of shut off valves in
		Common Area Litter Control (N4)

Park Site and Detention Basin	Efficient Irrigation (S4)	Street Sweeping (N5)
		Drainage Facility Inspection and Maintenance (N6)
On-site storm drain catch basins with insert. Locations are shown on WQMP BMPs Site Map	On-site storm drain signage will utilize language, "No Dumping Drains to River", or equally approved text that is consistent with the County' requirements. Landscape area drains surrounded by vegetation will not be signed. The signs will be located at storm drain inlets in impervious areas and will be either stenciled or placarded.	Inspect the signage once per year. Repair or replace when the signage becomes unreadable. The original owner or developer will be responsible for the first stenciling of the storm drain system. Thereafter when the property is sold, the new owner will assume the responsibility for inspection, maintenance, and funding. See CASQA SD-13 BMP Fact Sheet in WQMP for additional information
	On-site drainage facility inspection and maintenance. On-site drainage structures, including all storm drain clean outs, area drains, inlets, catch basins, inlet & outlet structures, forebays, & water treatment control basins shall be inspected and maintained on a regular basis to insure their operational adequacy. See CASQA SC-44 BMP Fact Sheet in WQMP for additional information.	Inspect at a minimum, once before the onset of the rainy season (Oct 1 to May 1), once during the rainy season, and once after the rainy season. Maintenance should include removal of trash, debris, & sediment and the repair of any deficiencies or damage that may impact water quality. The property owner will assume the responsibility for all on-site drainage facility inspection, maintenance, and funding.

Section I: Coordinate Submittal with Other Site Plans

For Final WQMPs, populate Table I-1 below to assist the plan checker in an expeditious review of your project. During construction and at completion, County of Riverside inspectors will verify the installation of BMPs against the approved plans. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table I-1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)
BMP – C	Extended / Detention Basin C	In Final design
BMP – F	Bio-filtration Basin E	In Final design

BMP – G	Bio-filtration / Detention Basin G	In Final design

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. The Copermittee with jurisdiction over the Project site can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Use Table I-2 to identify other applicable permits that may impact design of the site. If yes is answered to any of the items below, the Copermittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Table I-2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act Section 401 Water Quality Certification	☐ Y	☒ N
US Army Corps of Engineers, Clean Water Act Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)*	☒ Y	☐ N

Section J: Operation, Maintenance and Funding

Applicant is required to state the intended responsible party for BMP Operation, Maintenance and Funding at the Preliminary WQMP phase. The remaining requirements as outlined above are required for Final WQMP only.

The Copermittee with jurisdiction over the Project site will periodically verify that BMPs on your Project are maintained and continue to operate as designed. To make this possible, the Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement maintenance of BMPs in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized Operations and Maintenance or inspections but will require typical landscape maintenance as noted in Chapter 5, in the SMR WQMP. Include a brief description of typical landscape maintenance for these areas.

The Copermittee with jurisdiction over the Project site will also require that you prepare and submit a detailed BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a BMP Operation and Maintenance Plan are in Chapter 5 of the SMR WQMP.

Maintenance Mechanism: HOA and POA will have ongoing maintenance responsibilities. Site design and treatment BMPs have been designed to keep maintenance efforts in line with Keller Crossing Development project maintenance activities.

Will the proposed BMPs be maintained by a Homeowners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9, **see Appendix 9 for additional instructions.** Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Section K: Acronyms, Abbreviations and Definitions

Regional MS4 Permit	Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 and Order No. R9-2015-0100 an NPDES Permit issued by the San Diego Regional Water Quality Control Board.
Applicant	Public or private entity seeking the discretionary approval of new or replaced improvements from the Copermittee with jurisdiction over the project site. The Applicant has overall responsibility for the implementation and the approval of a Priority Development Project. The WQMP uses consistently the term "user" to refer to the applicant such as developer or project proponent. The WQMP employs also the designation "user" to identify the Registered Professional Civil Engineer responsible for submitting the Project-Specific WQMP, and designing the required BMPs.
Best Management Practice (BMP)	Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.
BMP Fact Sheets	BMP Fact Sheets are available in the LID BMP Design Handbook. Individual BMP Fact Sheets include sitting considerations, and design and sizing guidelines for seven types of structural BMPs (infiltration basin, infiltration trench, permeable pavement, harvest-and-use, bioretention, extended detention basin, and sand filter).
California Stormwater Quality Association (CASQA)	Publisher of the California Stormwater Best Management Practices Handbooks, available at www.cabmphandbooks.com.
Conventional Treatment Control BMP	A type of BMP that provides treatment of stormwater runoff. Conventional treatment control BMPs, while designed to treat particular Pollutants, typically do not provide the same level of volume reduction as LID BMPs, and commonly require more specialized maintenance than LID BMPs. As such, the Regional MS4 Permit and this WQMP require the use of LID BMPs wherever feasible, before Conventional Treatment BMPs can be considered or implemented.
Copermittees	The Regional MS4 Permit identifies the Cities of Murrieta, Temecula, and Wildomar, the County, and the District, as Copermittees for the SMR.

County	The abbreviation refers to the County of Riverside in this document.
CEQA	California Environmental Quality Act - a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.
CIMIS	California Irrigation Management Information System - an integrated network of 118 automated active weather stations all over California managed by the California Department of Water Resources.
CWA	Clean Water Act - is the primary federal law governing water pollution. Passed in 1972, the CWA established the goals of eliminating releases of high amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983. CWA Section 402(p) is the federal statute requiring NPDES permits for discharges from MS4s.
CWA Section 303(d) Waterbody	Impaired water in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of urban runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.
Design Storm	The Regional MS4 Permit has established the 85th percentile, 24-hour storm event as the "Design Storm". The applicant may refer to Exhibit A to identify the applicable Design Storm Depth (D85) to the project.
DCV	Design Capture Volume (DCV) is the volume of runoff produced from the Design Storm to be mitigated through LID Retention BMPs, Other LID BMPs and Volume Based Conventional Treatment BMPs, as appropriate.
Design Flow Rate	The design flow rate represents the minimum flow rate capacity that flow-based conventional treatment control BMPs should treat to the MEP, when considered.
DCIA	Directly Connected Impervious Areas - those impervious areas that are hydraulically connected to the MS4 (i.e. street curbs, catch basins, storm drains, etc.) and thence to the structural BMP without flowing over pervious areas.
Discretionary Approval	A decision in which a Copermittee uses its judgment in deciding whether and how to carry out or approve a project.
District	Riverside County Flood Control and Water Conservation District.

DMA	A Drainage Management Area - a delineated portion of a project site that is hydraulically connected to a common structural BMP or conveyance point. The Applicant may refer to Section 3.3 for further guidelines on how to delineate DMAs.
Drawdown Time	Refers to the amount of time the design volume takes to pass through the BMP. The specified or incorporated drawdown times are to ensure that adequate contact or detention time has occurred for treatment, while not creating vector or other nuisance issues. It is important to abide by the drawdown time requirements stated in the fact sheet for each specific BMP.
Effective Area	Area which 1) is suitable for a BMP (for example, if infiltration is potentially feasible for the site based on infeasibility criteria, infiltration must be allowed over this area) and 2) receives runoff from impervious areas.
ESA	An Environmental Sensitive Area (ESA) designates an area "in which plants or animals life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments". (Reference: California Public Resources Code § 30107.5).
ET	Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is also an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity
FAR	The Floor Area Ratio (FAR) is the total square feet of a building divided by the total square feet of the lot the building is located on.
Flow-Based BMP	Flow-based BMPs are conventional treatment control BMPs that are sized to treat the design flow rate.
FPPP	Facility Pollution Prevention Plan
HCOC	Hydrologic Condition of Concern - Exists when the alteration of a site's hydrologic regime caused by development would cause significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects.
HMP	Hydromodification Management Plan – Plan defining Performance Standards for PDPs to manage increases in runoff discharge rates and durations.
Hydrologic Control BMP	BMP to mitigate the increases in runoff discharge rates and durations and meet the Performance Standards set forth in the HMP.
HSG	Hydrologic Soil Groups – soil classification to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSGs are A (very low runoff potential/high infiltration rate), B, C, and D (high runoff potential/very low infiltration rate)

Hydromodification	The Regional MS4 Permit identifies that increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses.
JRMP	A separate Jurisdictional Runoff Management Plan (JRMP) has been developed by each Copermittee and identifies the local programs and activities that the Copermittee is implementing to meet the Regional MS4 Permit requirements.
LID	Low Impact Development (LID) is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques. LID site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of storm water runoff.
LID BMP	A type of stormwater BMP that is based upon Low Impact Development concepts. LID BMPs not only provide highly effective treatment of stormwater runoff, but also yield potentially significant reductions in runoff volume – helping to mimic the pre-project hydrologic regime, and also require less ongoing maintenance than Treatment Control BMPs. The applicant may refer to Chapter 2.
LID BMP Design Handbook	The LID BMP Design Handbook was developed by the Copermittees to provide guidance for the planning, design and maintenance of LID BMPs which may be used to mitigate the water quality impacts of PDPs within the County.
LID Bioretention BMP	LID Bioretention BMPs are bioretention areas are vegetated (i.e., landscaped) shallow depressions that provide storage, infiltration, and evapotranspiration, and provide for pollutant removal (e.g., filtration, adsorption, nutrient uptake) by filtering stormwater through the vegetation and soils. In bioretention areas, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the adsorption of pollutants (e.g., dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants use soil moisture and promote the drying of the soil through transpiration. The Regional MS4 Permit defines "retain" as to keep or hold in a particular place, condition, or position without discharge to surface waters.
LID Biofiltration BMP	BMPs that reduce stormwater pollutant discharges by intercepting rainfall on vegetative canopy, and through incidental infiltration and/or evapotranspiration, and filtration, and other biological and chemical processes. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded, and sequestered by the soil and plants, and collected through an underdrain.

LID Harvest and Reuse BMP	BMPs used to facilitate capturing Stormwater Runoff for later use without negatively impacting downstream water rights or other Beneficial Uses.
LID Infiltration BMP	BMPs to reduce stormwater runoff by capturing and infiltrating the runoff into in-situ soils or amended onsite soils. Typical LID Infiltration BMPs include infiltration basins, infiltration trenches and pervious pavements.
LID Retention BMP	BMPs to ensure full onsite retention without runoff of the DCV such as infiltration basins, bioretention, chambers, trenches, permeable pavement and pavers, harvest and reuse.
LID Principles	Site design concepts that prevent or minimize the causes (or drivers) of post-construction impacts, and help mimic the pre-development hydrologic regime.
MEP	Maximum Extent Practicable - standard established by the 1987 amendments to the CWA for the reduction of Pollutant discharges from MS4s. Refer to Attachment C of the Regional MS4 Permit for a complete definition of MEP.
MF	Multi-family – zoning classification for parcels having 2 or more living residential units.
MS4	Municipal Separate Storm Sewer System (MS4) is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.
New Development Project	Defined by the Regional MS4 Permit as 'Priority Development Projects' if the project, or a component of the project meets the categories and thresholds described in Section 1.1.1.
NPDES	National Pollution Discharge Elimination System - Federal program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.
NRCS	Natural Resources Conservation Service

PDP	Priority Development Project - Includes New Development and Redevelopment project categories listed in Provision E.3.b of the Regional MS4 Permit.
Priority Pollutants of Concern	Pollutants expected to be present on the project site and for which a downstream water body is also listed as Impaired under the CWA Section 303(d) list or by a TMDL.
Project-Specific WQMP	A plan specifying and documenting permanent LID Principles and Stormwater BMPs to control post-construction Pollutants and stormwater runoff for the life of the PDP, and the plans for operation and maintenance of those BMPs for the life of the project.
Receiving Waters	Waters of the United States.
Redevelopment Project	The creation, addition, 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 trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair. Project that meets the criteria described in Section 1.
Runoff Fund	Runoff Funds have not been established by the Copermittees and are not available to the Applicant. If established, a Runoff Fund will develop regional mitigation projects where PDPs will be able to buy mitigation credits if it is determined that implementing onsite controls is infeasible.
San Diego Regional Board	San Diego Regional Water Quality Control Board - The term "Regional Board", as defined in Water Code section 13050(b), is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200. State agency responsible for managing and regulating water quality in the SMR.
SCCWRP	Southern California Coastal Water Research Project
Site Design BMP	Site design BMPs prevent or minimize the causes (or drivers) of post-construction impacts, and help mimic the pre-development hydrologic regime.
SF	Parcels with a zoning classification for a single residential unit.
SMC	Southern California Stormwater Monitoring Coalition
SMR	The Santa Margarita Region (SMR) represents the portion of the Santa Margarita Watershed that is included within the County of Riverside.

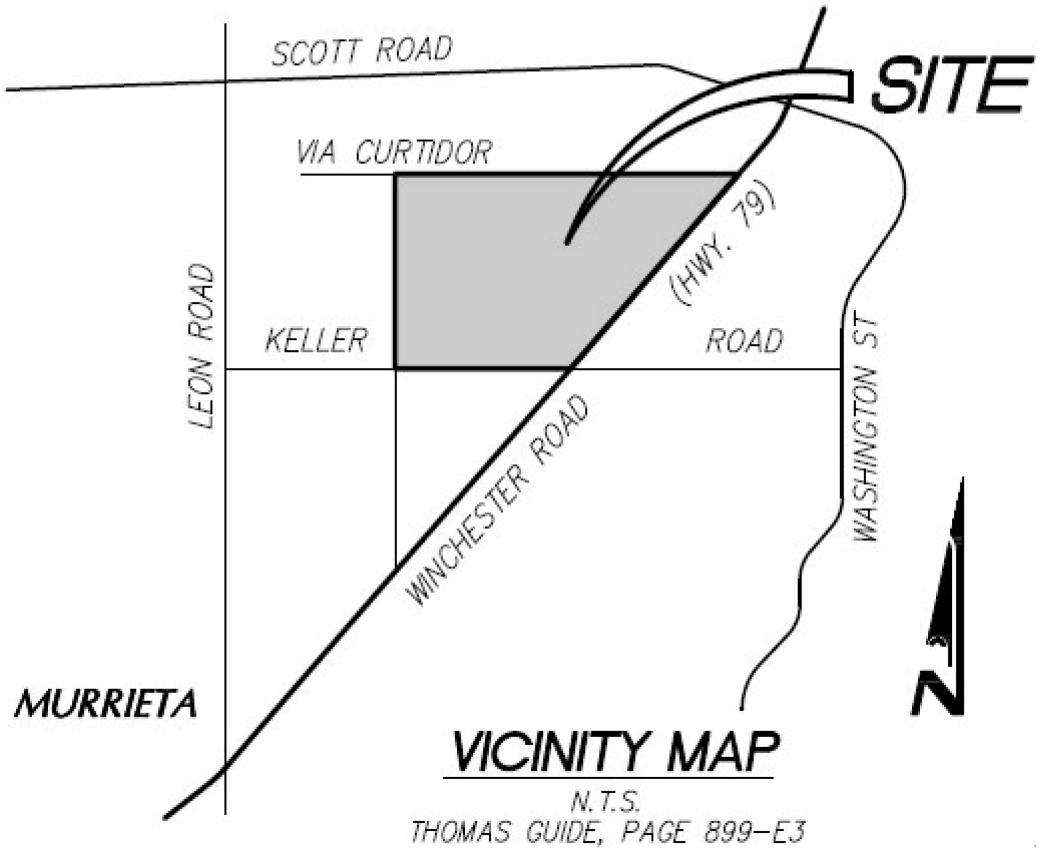
Source Control BMP	Source Control BMPs land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between Pollutants and runoff.
Structural BMP	Structures designed to remove pollutants from stormwater runoff and mitigate hydromodification impacts.
SWPPP	Storm Water Pollution Prevention Plan
Tentative Tract Map	Tentative Tract Maps are required for all subdivision creating five (5) or more parcels, five (5) or more condominiums as defined in Section 783 of the California Civil Code, a community apartment project containing five (5) or more parcels, or for the conversion of a dwelling to a stock cooperative containing five (5) or more dwelling units.
TMDL	Total Maximum Daily Load - the maximum amount of a Pollutant that can be discharged into a waterbody from all sources (point and non-point) and still maintain Water Quality Standards. Under CWA Section 303(d), TMDLs must be developed for all waterbodies that do not meet Water Quality Standards after application of technology-based controls.
USEPA	United States Environmental Protection Agency
Volume-Based BMP	Volume-Based BMPs applies to BMPs where the primary mode of pollutant removal depends upon the volumetric capacity such as detention, retention, and infiltration systems.
WQMP	Water Quality Management Plan
Wet Season	The Regional MS4 Permit defines the wet season from October 1 through April 30.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

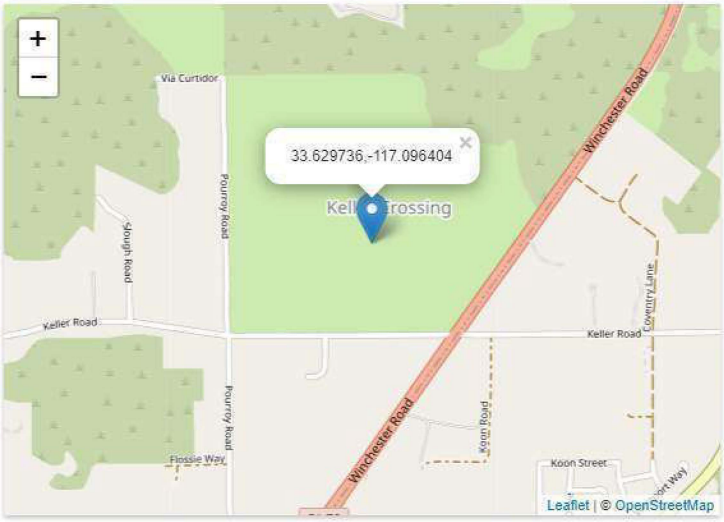
Complete the checklist below to verify all exhibits and components are included in the Project-Specific WQMP. Refer Section 4 of the SMR WQMP and Section D of this Template.

Map and Site Plan Checklist
Indicate all Maps and Site Plans are included in your Project-Specific WQMP by checking the boxes below.
☒ Vicinity and Location Map
☒ Existing Site Map (unless exiting conditions are included in WQMP Site Plan)
☒ WQMP Site Plan
☒ Parcel Boundary and Project Footprint
☒ Existing and Proposed Topography & Drainage Management Areas (DMAs)
☒ Proposed Structural Best Management Practices (BMPs), with cross sections
☒ Drainage Paths
☒ Drainage infrastructure, inlets, overflows
☒ Source Control & Site Design BMPs (notes can be used for BMPs that can't be depicted)
☐ Buildings, Roof Lines, Downspouts
☐ Impervious Surfaces
☐ Pervious Surfaces (i.e. Landscaping)
☒ Standardized Labeling
☒ Use Riverside County Flood Control CB-110 for outlet structure with block outs for a trash screen out the outside, and an orifice/weir plate(s) on the inside of the structure or other design that is as easy to maintain. The screen should be as large as possible to minimize clogging.
☐ If BMPs are in the road R/W (only with CFD/CSA maintenance or LID Principals) add "BMP" paddle markers at the start and end of each BMPs and LID principals
☐ When underdrain are proposed, gravel shall be clean washed gravel, AASHTO #57 stone preferred. Underdrains shall be Schedule 40 PVC, with a minimum slope of 0.005, with cleanouts equal in diameter of the subdrain that extends 6 inches above the media with a lockable screw cap, spaced every 50 feet, at the collector drain line connection, and at any bends.
☐ When BSM is proposed, BSM shall consist of 60-80% clean sand, up to 20% clean topsoil, and 20% of a nutrient-stabilized organic amendment. BSM shall be placed on top of 3-inches of Choker Sand placed on top of 3-inches of ASTM No. 8 stone (1/4 to 1/2-inch pea gravel), and placed on top of 12 to 24-inches of a clean, open-graded drain rock layer.
☐ For Tracts, the Regional Board requires fully functioning WQMP BMPs for opening model home complexes, sales offices, or use of roads (i.e. prior to occupancy or intended use of any portion of the project). The County encourages phasing post-construction BMPs, small structural BMPs (e.g. specifically for sales offices), or self-retaining areas. This phasing can be shown on the WQMP site map and sequencing shall be included on the Grading plans, so that a fully functioning WQMP BMP is addressing any portion of the project that has been granted occupancy or granted the intended use.



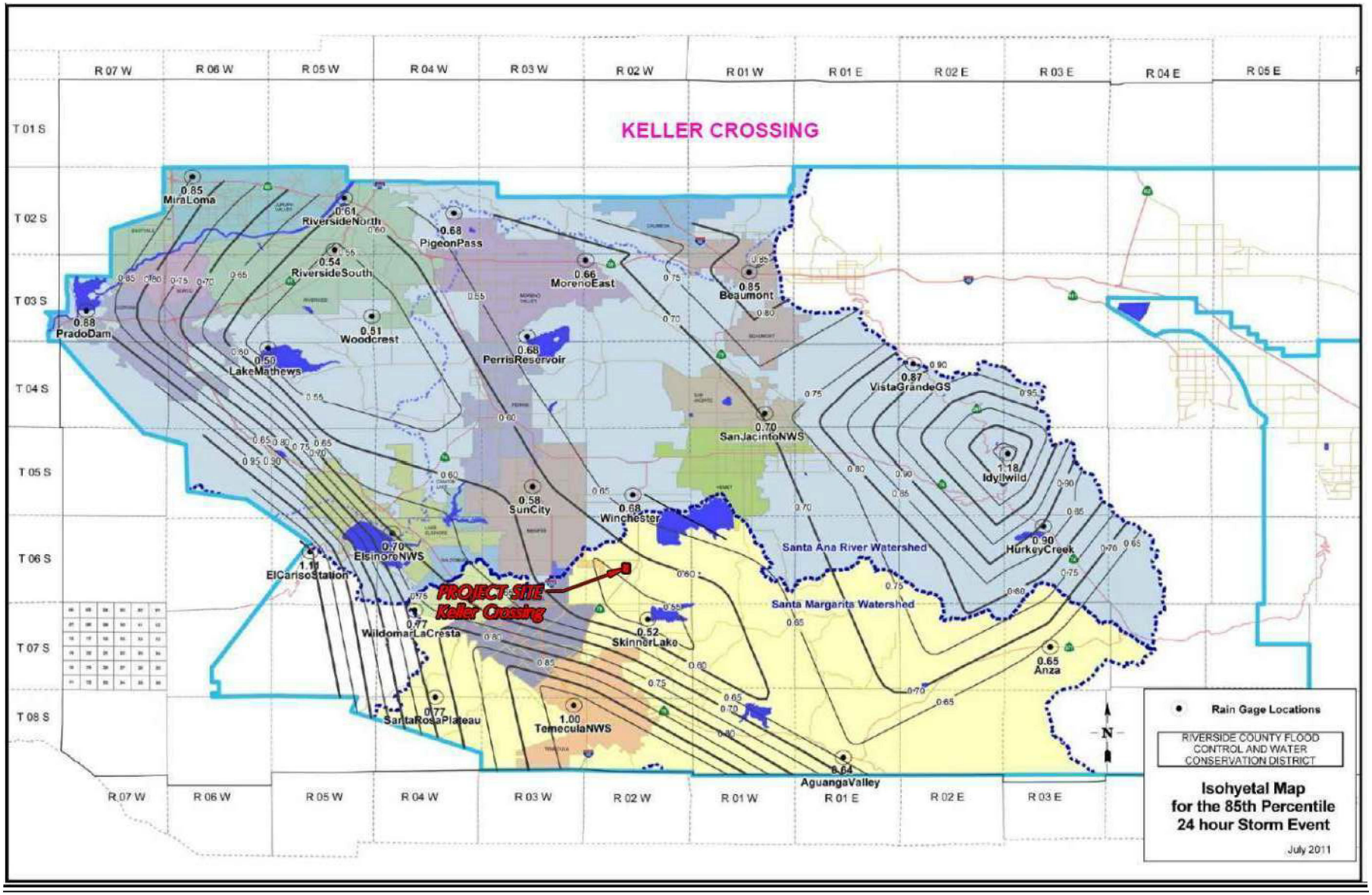


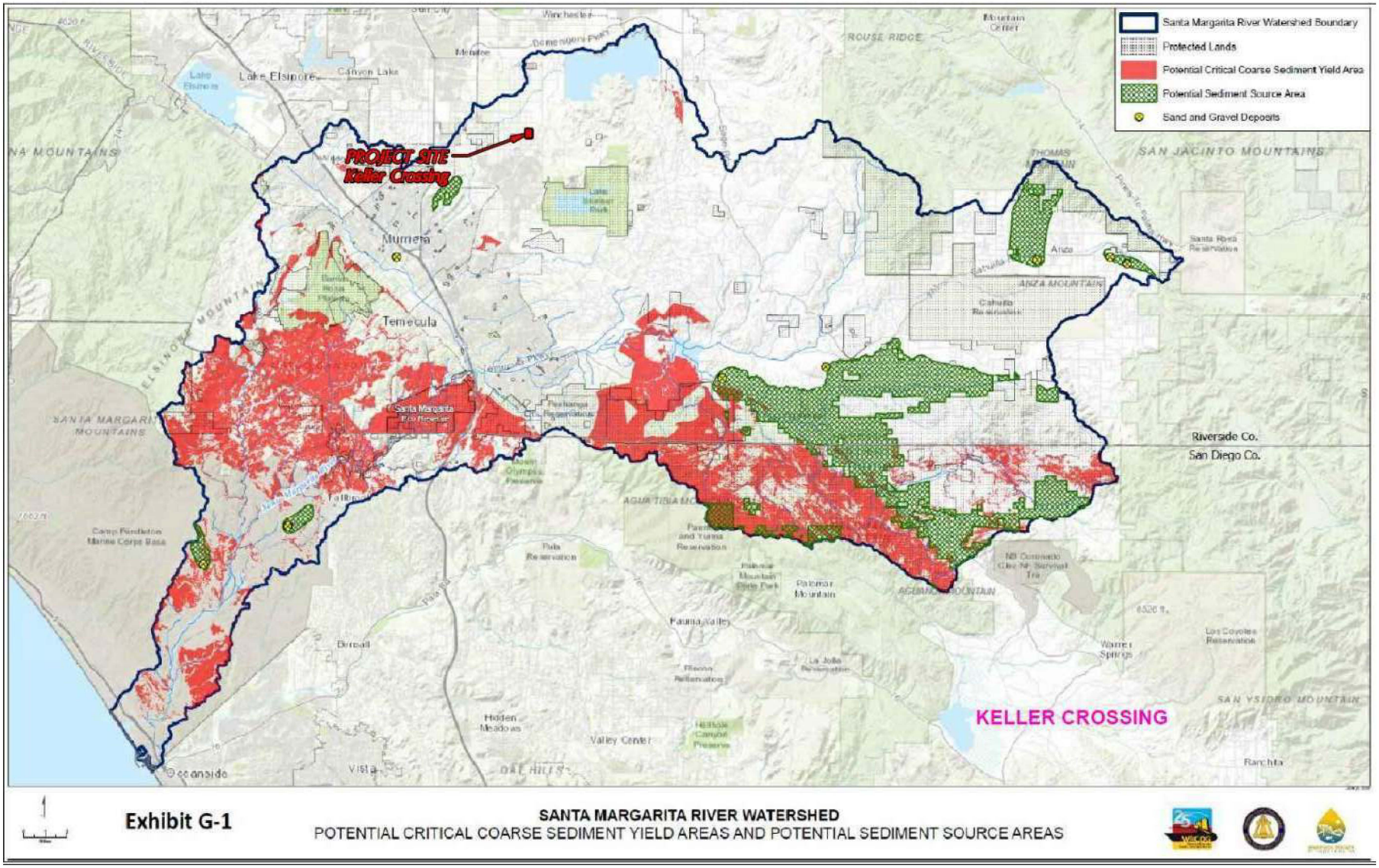
Aerial Map – Current Condition





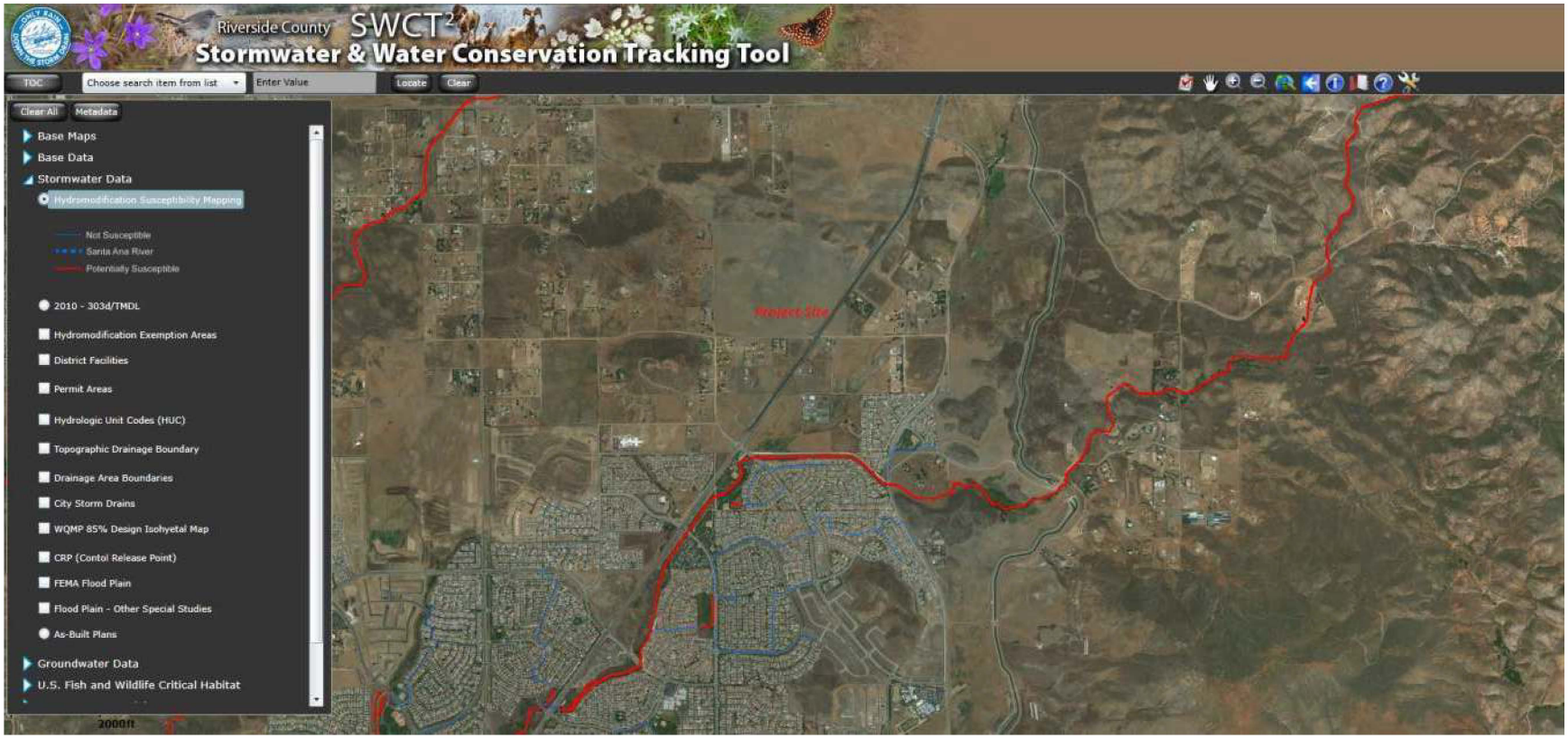
Lat Long	GPS Coordinates
(33.629736, -117.096404)	33° 37' 47.0496" N 117° 5' 47.0544" W


KELLER CROSSING
R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
0.85 MiraLoma
0.61 RiversideNorth
0.68 PigeonPass
0.54 RiversideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
PROJECT SITE
Keller Crossing
Santa Ana River Watershed
Santa Margarita Watershed
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
N
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011

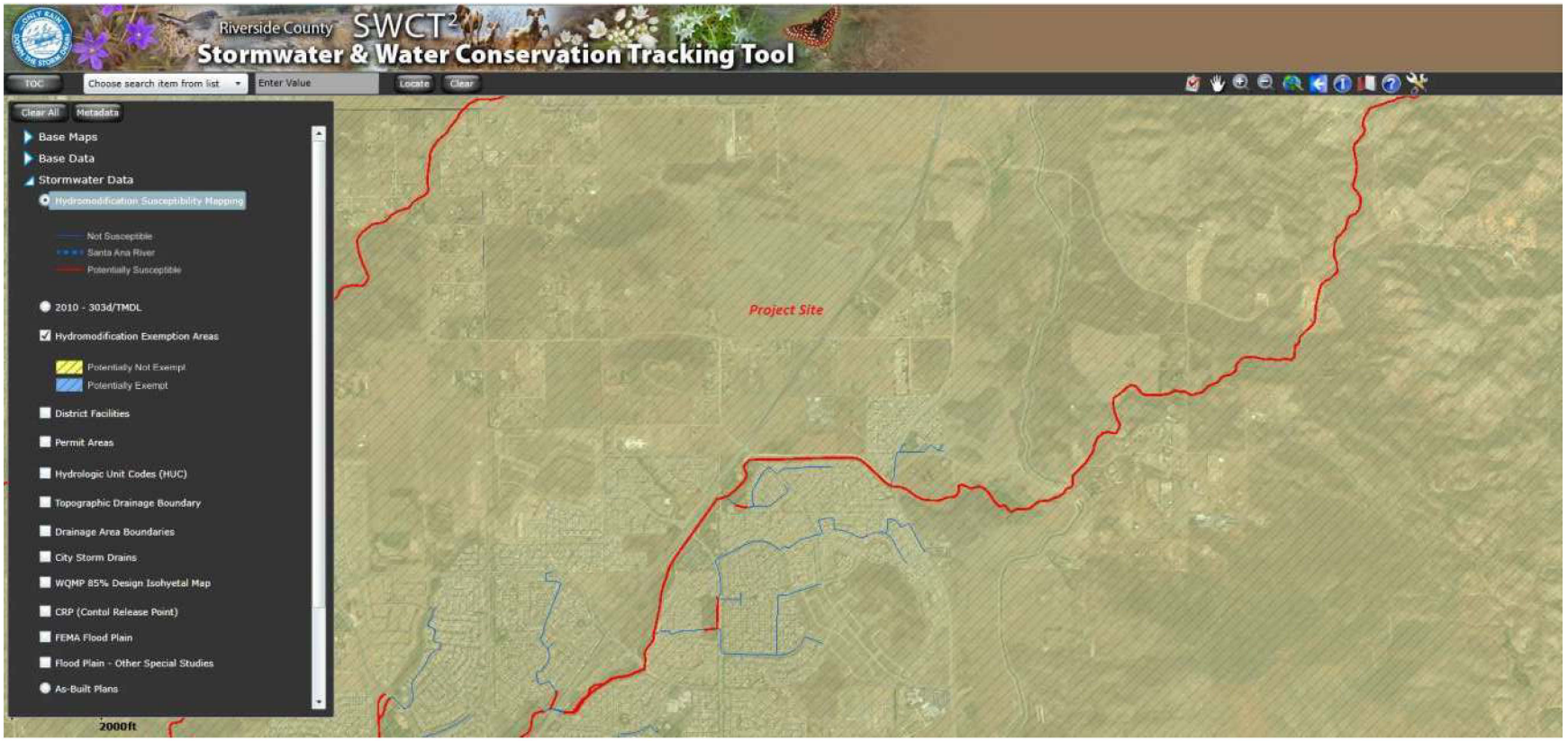

Santa Margarita River Watershed Boundary
Protected Lands
Potential Critical Coarse Sediment Yield Area
Potential Sediment Source Area
Sand and Gravel Deposits
PROJECT SITE
Keller Crossing
KELLER CROSSING
Lake Elsinore
Canyon Lake
Murrieta
Temecula
Riverside Co.
San Diego Co.
SAN JACINTO MOUNTAINS
ANZA MOUNTAIN
ROUSE RIDGE
Oceanside
Vista
Valley Center
Hidden Meadows
Bonsall
Pauma Valley
Warner Springs
Ranchita
Exhibit G-1
SANTA MARGARITA RIVER WATERSHED
POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS AND POTENTIAL SEDIMENT SOURCE AREAS

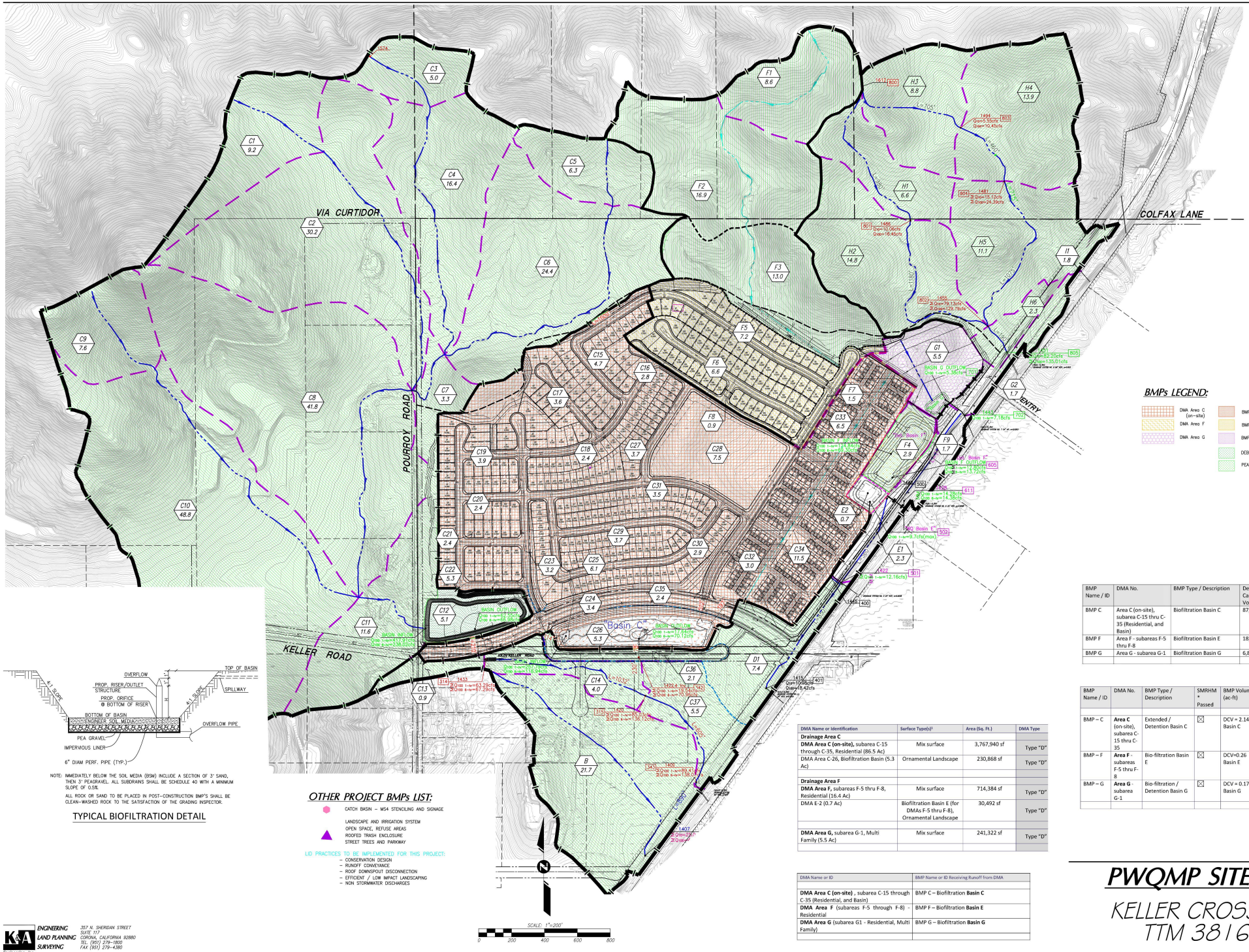

Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
2010 - 303d/TMDL
Hydromodification Exemption Areas
District Facilities
District Facilities
Proposed District Facilities
Basin
Detention Basin
Retention Basin
Debris Basin
Dam
Levee
Spreading Grounds
Other
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
Rain Gauges
Isohyetal Minor Contours
Isohyetal Major Contours
CRP (Contol Release Point)
2000ft
Project Site


Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
2010 - 303d/TMDL
Hydromodification Exemption Areas
District Facilities
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
Warm Springs Creek
Project Site
2000ft


Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
Not Susceptible
Santa Ana River
Potentially Susceptible
2010 - 303d/TMDL
Hydromodification Exemption Areas
District Facilities
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
As-Built Plans
Groundwater Data
U.S. Fish and Wildlife Critical Habitat
2000 ft
Project Site


Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Hydromodification Susceptibility Mapping
Not Susceptible
Santa Ana River
Potentially Susceptible
2010 - 303d/TMDL
Hydromodification Exemption Areas
District Facilities
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
As-Built Plans
Groundwater Data
U.S. Fish and Wildlife Critical Habitat
WRMSHCP Potential Survey Areas
SKRHCP
1000ft
Project Site


Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
Not Susceptible
Santa Ana River
Potentially Susceptible
2010 - 303d/TMDL
Hydromodification Exemption Areas
Potentially Not Exempt
Potentially Exempt
District Facilities
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
As-Built Plans
2000ft
Project Site



NOTE: IMMEDIATELY BELOW THE SOIL MEDIA (BSM) INCLUDE A SECTION OF 3" SAND, THEN 3" PEAGRAVEL. ALL SUBDRAINS SHALL BE SCHEDULE 40 WITH A MINIMUM SLOPE OF 0.5%.

ALL ROCK OR SAND TO BE PLACED IN POST-CONSTRUCTION BMP'S SHALL BE CLEAN-WASHED ROCK TO THE SATISFACTION OF THE GRADING INSPECTOR.

TYPICAL BIOFILTRATION DETAIL

BMPs LEGEND:

- DMA Area C (on-site)
- DMA Area F
- DMA Area G
- BMP-C, EXTENDED/DETENTION BASIN C
- BMP-F, BIOFILTRATION BASIN E
- BMP-G, BIOFILTRATION/DETENTION BASIN G
- DEBRIS / DETENTION BASIN C (OFF-SITE)
- PEAKFLOW DETENTION BASIN F

OTHER PROJECT BMPs LIST:

- CATCH BASIN – MS4 STENCILING AND SIGNAGE
- LANDSCAPE AND IRRIGATION SYSTEM
  OPEN SPACE, REFUSE AREAS
  ROOFED TRASH ENCLOSURE
  STREET TREES AND PARKWAY

LID PRACTICES TO BE IMPLEMENTED FOR THIS PROJECT:
- CONSERVATION DESIGN
- RUNOFF CONVEYANCE
- ROOF DOWNSPOUT DISCONNECTION
- EFFICIENT / LOW IMPACT LANDSCAPING
- NON STORMWATER DISCHARGES

BMP Name / ID	DMA No.	BMP Type / Description	Design Capture Volume (ft³)	Proposed Volume (ft³)
BMP C	Area C (on-site), subarea C-15 thru C-35 (Residential, and Basin)	Biofiltration Basin C	87,919	93,310
BMP F	Area F - subareas F-5 thru F-8	Biofiltration Basin E	18,455	18,500
BMP G	Area G - subarea G-1	Biofiltration Basin G	6,837	7,700

BMP Name / ID	DMA No.	BMP Type / Description	SMRHM > Passed	BMP Volume (ac-ft)	BMP Footprint (ac)	Drawdown time (hr)
BMP – C	**Area C** (on-site), subarea C-15 thru C-35	Extended / Detention Basin C	☒	DCV = 2.14 Basin C	5.3	Less than 72 hours
BMP – F	**Area F** - subareas F-5 thru F-8	Bio-filtration Basin E	☒	DCV=0.26 Basin E	0.7	Less than 72 hours
BMP – G	**Area G** - subarea G-1	Bio-filtration / Detention Basin G	☒	DCV = 0.176 Basin G	0.25	Less than 72 hours

DMA Name or Identification	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
Drainage Area C			
DMA Area C (on-site), subarea C-15 through C-35, Residential (86.5 Ac)	Mix surface	3,767,940 sf	Type "D"
DMA Area C-26, Biofiltration Basin (5.3 Ac)	Ornamental Landscape	230,868 sf	Type "D"
Drainage Area F			
DMA Area F, subareas F-5 thru F-8, Residential (16.4 Ac)	Mix surface	714,384 sf	Type "D"
DMA E-2 (0.7 Ac)	Biofiltration Basin E (for DMAs F-5 thru F-8), Ornamental Landscape	30,492 sf	Type "D"
DMA Area G, subarea G-1, Multi Family (5.5 Ac)	Mix surface	241,322 sf	Type "D"

DMA Name or ID	BMP Name or ID Receiving Runoff from DMA
DMA Area C (on-site) , subarea C-15 through C-35 (Residential, and Basin)	BMP C – Biofiltration **Basin C**
DMA Area F (subareas F-5 through F-8) - Residential	BMP F – Biofiltration **Basin E**
DMA Area G (subarea G1 - Residential, Multi Family)	BMP G – Biofiltration **Basin G**

PWQMP SITE PLAN

KELLER CROSSING
TTM 38163

K&A Engineering, Inc.
ENGINEERING
LAND PLANNING
SURVEYING
357 N. SHERIDAN STREET
SUITE 117
CORONA, CALIFORNIA 92880
TEL. (951) 279-1820
FAX (951) 279-4380

Map: I:\pw\MM\Jobs\TDP\100_Drawings\EXHIBITS\Preliminary\Drainage Study\BMP\TDP-TP-BMP_PWQMP_SITE PLAN.dwg Layout: 30x42 L Saved: 1/5/2026 1:31 PM Plotted: 1/5/2026 2:16 PM By: Ron Perez

Appendix 2: Construction Plans

*The latest set of Grading, Drainage Plans, and Street Improvement plans **shall be included***

Bioretention/Biofiltration BMPs construction notes (Santa Margarita Region only). For Bioretention and Biofiltration facilities, the **following construction notes shall be shown on the Grading and/or Drainage plans:**

1. *The Engineer shall furnish to the County a copy of the source testing and a signed certification that the fully blended Bioretention/Biofiltration Soil Media (BSM) material meets all of the WQMP requirements before material is imported or if the material is mixed onsite prior to installation.*
2. *As BSM material is being installed, Quality Assurance (QA) tests shall be conducted or for every 1,200 tons or 800 cubic yards mixed on-site from a completely mixed stockpile or windrow, with a minimum of three tests. For imported material from a supplier with a quality control program the QA tests shall be conducted 2,400 tons or 1,600 cubic yards from the supplier.*
3. *The Engineer conducting the Quality Control testing shall furnish to the County copy of the QA testing and a certification that the BSM for the project meets all of the following requirements. Certified mitigation plans can be used for exceedances, as long as all requirements are designed to be met.*
    a. *BSM shall not be compacted. BSM shall consist of 60-80% clean sand, up to 20% clean topsoil, and 20% of a nutrient-stabilized organic amendment. The initial infiltration rate shall be greater than 8 inches per hour per laboratory test.*
    b. *pH: 6.0 – 8.5; Salinity: 0.5 to 3.0 mmho/cm as electrical conductivity; Sodium absorption ratio: < 6.0; Chloride: < 800 ppm in saturated extract; Cation Exchange Capacity (CEC): > 10 meq/100 g; Organic Matter: 2 to 5-percent on a dry weight basis; Carbon: Nitrogen Ratio: 12 to 40, preferably 15 to 40; Gravel larger than 2mm: 0 to 25-percent of the total sample; Clay smaller than 0.005mm: 0 to 5 percent of the non-gravel fraction.*
    c. *BSM shall be tested to limit the leaching of potential inherent pollutants. BSM used in Biofiltration BMPs shall conform to the following limits for pollutant concentrations in saturated extract: Phosphorus: < 1 mg/L; Nitrate < 3 mg/L, Copper < 0.025 mg/L. These pollutant limits are for the amount that is leached from the sample, not from the soil sample itself. Testing may be performed after laboratory rinsing of media with up to 15 pore volumes of water. Equivalent test results will be accepted if certified by a laboratory or appropriate testing facility.*
    d. *Low nutrient compost used in BSM shall be sourced from a facility permitted through CalRecycle, preferably through USCC STA program. Compost shall conform to the following requirements: Physical contaminants <1% by dry weight; Carbon:Nitrogen ratio: 12:1 to 40:1; Maturity/Stability shall conform to either: Solvita Maturity Index: ≥ 5.5, CO2 Evolution: < 2.5 mg CO2-C per g compost organic matter per day, or < 5 mg CO2-C per g compost C per day; Select Pathogens and Trace metals shall pass US EPA Class A Standard. Testing shall be no more than 6 months old and representative of current stockpiles.*
    e. *Coconut coir pith used in BSM shall be thoroughly rinsed with freshwater and screened to remove coarse fibers as part of production and aged > 6 months. Peat used in BSM shall be sphagnum peat.*

Please notify the County if additional sources and laboratories can be added to this list. The Potential Sources and Laboratories are not part of the construction note - **Potential BSM sources may include**: Gail Materials (Temescal Valley), Agriservice (Oceanside), and Greatsoils (Escondido). Earthworks (Riverside); **Potential Laboratories may include**: Fruit Growers Laboratory, Inc. (Santa Paula, http://www.fglinc.com/) Wallace Laboratories (El Segundo, http://us.wlabs.com/). Control Labs (Watsonville, http://www.controllabs.com) and A&L Western Laboratories (Modesto, http://www.al-labs-west.com/).

IN THE COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163

PROPERTY ACREAGE
GROSS = 196.0 AC.
NET = 191.4 AC.

ASSESSOR'S PARCEL NUMBER
472-110-001, 002, 003, 004, 007, 008, 009, 32, 033, 034

SECTIONS, TOWNSHIPS AND RANGES
S 1/2, SECTION 21, T.6S., R.2W.

THOMAS BROTHERS MAP
PORTIONS OF PAGE 899-GRID D2, 899-GRID D3, 899-GRID E2, 899-GRID E3, 899-GRID F2, 899-GRID F3

EXISTING GENERAL PLAN DESIGNATION
MEDIUM DENSITY RESIDENTIAL, COMMERCIAL RETAIL, LOW DENSITY RESIDENTIAL MIXED USE AREA, OPEN SPACE-CONSERVATION, AND VERY LOW DENSITY RESIDENTIAL

PRESENT USE
VACANT

PROPOSED USE
MEDIUM DENSITY RESIDENTIAL, MEDIUM HIGH DENSITY RESIDENTIAL, HIGH DENSITY RESIDENTIAL, OPEN SPACE RECREATION, OPEN SPACE CONSERVATION, OPEN SPACE CONSERVATION HABITAT, OPEN SPACE WATER

EXISTING AND PROPOSED ZONING
KELLER CROSSING SPECIFIC PLAN (SP 380)

BENCHMARK:
RECOVERY NOTE BY METRO WATER DISTR SO. CALIFORNIA 1992
2.8 MILES (4.5 KM) NORTHWEST OF LAKE SKINNER, AT THE NORTHWEST CORNER OF KELLER ROAD AND WASHINGTON STREET, 30 FEET (9.1 M) WEST OF THE CENTERLINE OF WASHINGTON STREET, 24 FEET (7.3 M) NORTH OF THE CENTERLINE OF KELLER ROAD, 8.8 FEET (2.7 M) SOUTH OF POWER POLE NO. 20758806, 2 FEET (0.6 M) NORTH OF A MONUMENT SURVEY MARKER, A 3-1/2 INCH STANDARD BRASS DISK, SET FLUSH, IN TOP OF A 6 INCH BY 6 INCH CONCRETE POST, 0.5 FEET (15.2 CM) ABOVE THE GROUND.
ELEVATION:1453.58 (NGVD 88')

LEGAL DESCRIPTION:
PARCELS 1 THROUGH 10, INCLUSIVE, OF PARCEL MAP 15244, AS SHOWN BY PARCEL MAP RECORDED IN BOOK 85, PAGES 6 AND 7 OF PARCEL MAPS, RIVERSIDE COUNTY RECORDS.

EXCEPTING THEREFROM THAT PORTION OF PARCELS 9 AND 10 CONVEYED TO THE STATE OF CALIFORNIA IN GRANT DEED RECORDED NOVEMBER 18, 2010 AS INSTRUMENT NO. 2010-0556116, OF OFFICIAL RECORDS.

ALSO EXCEPTING THEREFROM THAT PORTION OF PARCEL 8 CONVEYED TO THE STATE OF CALIFORNIA IN GRANT DEED RECORDED NOVEMBER 18, 2010 AS INSTRUMENT NO. 2010-0556117, OF OFFICIAL RECORDS.

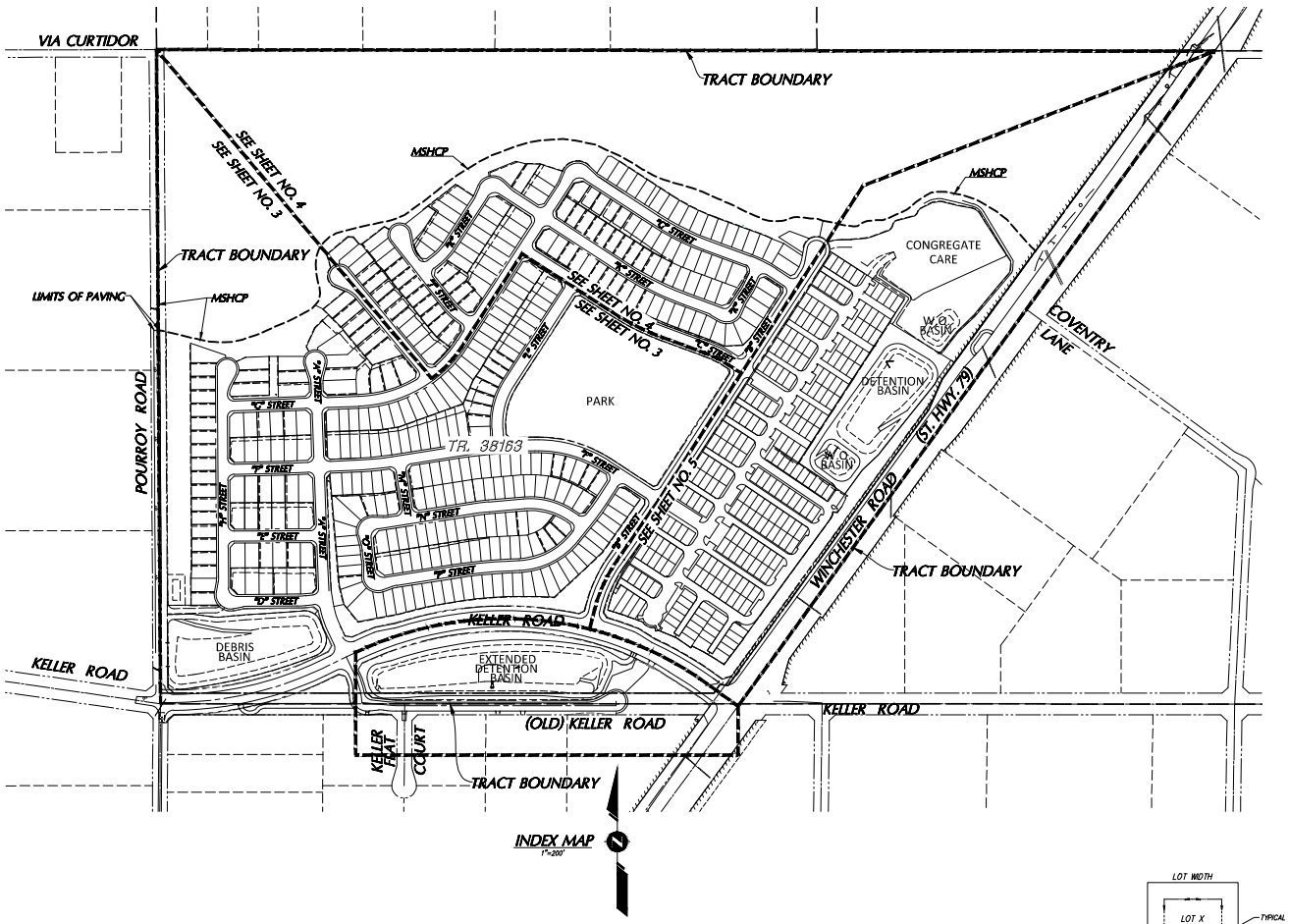
APN: 472-110-001 THROUGH 472-110-004, 472-110-007 THROUGH 472-110-009, AND 472-110-032 THROUGH 472-110-034.

NOTES:
FOR SITE DRAINAGE WITHIN 10'-0" OF THE BUILDING FOUNDATION THE PERVIOUS SURFACE IMMEDIATELY ADJACENT TO THE FOUNDATION MAY BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF 2% AND THE IMPERVIOUS SURFACES MAY BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF 1% FOR A MINIMUM DISTANCE OF 10'-0" AS MEASURED PERPENDICULAR TO THE FACE OF THE WALL, AND ALSO THE SWALE WITHIN 10 FEET OF THE BUILDING FOUNDATION MAY BE SLOPED AT A MINIMUM OF 1 PERCENT IF ALL THE FOLLOWING CONDITIONS ARE MET:

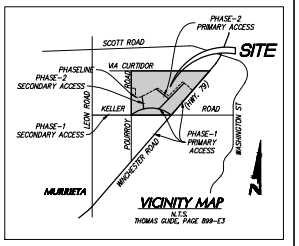
1. THE SURFACE SOIL IS CLASSIFIED AS HAVING "VERY LOW" TO "MEDIUM" EXPANSION POTENTIAL PER PROJECT COUNTY APPROVED GEOTECHNICAL REPORT.

2. SUFFICIENT AREA SUB SURFACE DRAINS SHALL BE PROVIDED WITHIN 10'-0" OF BUILDING FOUNDATION WITH A POSITIVE DRAINAGE TO AN APPROVED DRAINAGE FACILITY. THE DRAIN LINES SHALL HAVE A MINIMUM 0.5% SLOPE AND MAINTAIN A MINIMUM 3" DIAMETER.

3. ALL ASPECTS OF THE PRECISE GRADE DRAINAGE DESIGN SHALL BE VERIFIED BY THE CIVIL ENGINEER OF RECORD AND SUBMITTED TO GRADING INSPECTOR PRIOR TO PRECISE GRADING PERMIT FINAL. [CBC 104.11 & CRC R104.11]



INDEX MAP
1"=200'



VICINITY MAP
N.T.S.
THOMAS GUIDE, PAGE 899-E3

PROPOSED STORM DRAINS
PROPOSED DRAINAGE & STORM DRAIN SYSTEMS WILL BE CONSTRUCTED WITH THIS SUBDIVISION. STORM DRAIN SYSTEMS SHALL BE MAINTAINED BY R.C.F.C.& W.D. OR BY THE RIVERSIDE COUNTY TRANSPORTATION DEPT.

GEOLOGIC HAZARD NOTE
PROJECT SITE IS NOT SUBJECT TO GEOLOGIC HAZARDS: ALQUIST-PRIOLO OR SPECIAL STUDIES ZONE. PROJECT IS SUSCEPTABLE TO SUBSIDENCE AND HAS LOW SUSCEPTABILITY TO LIQUIFACTION.

WELLS
THERE ARE EXISTING WELLS WITHIN 200 FEET OF PROPERTY

AERIAL TOPOGRAPHY
ARROWHEAD MAPPING CORP.
1887 BUSINESS CENTER DRIVE, SUITE 5A
SAN BERNARDINO, CA 92408
PH: 909-889-2400
(OCTOBER 2020)

PROPOSED SUBSURFACE SEPTIC DISPOSAL
THERE IS NO SUBSURFACE SEPTIC DISPOSAL PROPOSED FOR THIS PROJECT.

EASEMENT NOTES
SEE SHEET 9

ESTIMATED EARTHWORK
RAW CUT.....1,200,000 CY
RAW FILL.....1,200,000 CY
EXPORT (APPROX.).....0 CY

MOBILE HOME AND R.V. PARKING
THERE ARE NO DESIGNATED MOBILE HOME OR R.V. PARKING FACILITIES PROPOSED FOR THIS PROJECT.

FLOOD PLAIN DESIGNATION
THIS PROPERTY IS OUTSIDE OF THE 100-YEAR FLOOD PLAIN ZONE. SITE IS NOT SUBJECT TO OVERFLOW OR INUNDATION

GENERAL NOTES
1. THIS PROPERTY IS LOCATED WITHIN FLOOD ZONE "X" ESTABLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY. FLOOD ZONE "X" IS DEFINED AS "AREAS OF MINIMAL FLOODING". SAID DESIGNATION IS SHOWN ON FLOOD INSURANCE RATE MAP FOR RIVERSIDE COUNTY, UNINCORPORATED AREA, CALIFORNIA SHOWING COMMUNITY PANEL NUMBER 06065C2090G, DATED AUGUST 28, 2008.

2. EXCEPT AS SHOWN, THERE ARE NO ENCROACHMENTS ONTO ADJOINING PREMISES, STREETS OR ALLEYS BY AND BUILDINGS, STRUCTURES OR OTHER VISIBLE IMPROVEMENTS, AND NO ENCROACHMENTS ONTO SAID PREMISES BY BUILDINGS, STRUCTURES OR OTHER VISIBLE IMPROVEMENTS SITUATED ON ADJOINING PREMISES.

3. ANY UNDERGROUND UTILITIES HAVE NOT BEEN PHYSICALLY LOCATED.

4. THIS PROPERTY IS LOCATED IN RIVERSIDE COUNTY TRANSPORTATION AND LAND MANAGEMENT AGENCY PLANNING DEPARTMENT KELLER CROSSING SPECIFIC PLAN NO. 380, WHICH HAS A ZONING DESIGNATION OF SPECIFIC PLAN.

5. THIS PARCEL CONTAINS: 191.44 ACRES, MORE OR LESS.

6. THIS PROPERTY IS LOCATED WITHIN A VERY HIGH FIRE HAZARD AND LOCAL RESPONSIBILITY AREA.

7. THIS PROPERTY IS LOCATED WITHIN WRMSHCP CELL GROUP-U AND WITHIN CELL NUMBER - 5067

STREET SUMMARY

KELLER ROAD -	2478 LF	"G" STREET -	2917 LF
WINCHESTER ROAD -	2212 LF	"H" STREET -	939 LF
POURROY ROAD -	1912 LF	"J" STREET -	476 LF
"A" STREET -	1215 LF	"K" STREET -	1810 LF
"B" STREET -	1795 LF	"L" STREET -	754 LF
"C" STREET -	1022 LF	"M" STREET -	239 LF
"D" STREET -	408 LF	"N" STREET -	914 LF
"E" STREET -	398 LF	"O" STREET -	238 LF
"F" STREET -	1827 LF	"P" STREET -	1173 LF

PROPOSED IMPROVEMENT SCHEDULE
SCHEDULE "A"

PROPOSED DEVELOPMENT

PLANNING AREA	UNITS	ACRES	DENSITY	LAND USE PLAN DESIGNATION
1 (LOTS 1-41, 349-384)	77	16.03	4.80	MDR
2 (LOTS 42-173)	132	21.52	6.14	MHDR
3 (LOTS 174-384)	175	23.11	7.57	MHDR
4 (FEE SIMPLE LOTS 385-614)	230	19.42	11.84	HDR
5* (CONGREGATE CARE)	80	7.29	10.97	HDR
RESIDENTIAL SUBTOTAL	614	-	-	
*PROPOSED FUTURE DEVELOPMENT				
OPEN SPACE				
6	---	1.00	---	OS-C
7	---	2.49	---	OS-R
8	---	8.88	---	OS-R
9	---	61.42	---	OS-CH
10	---	4.19	---	OS-W
11	---	4.79	---	OS-W
12	---	7.02	---	OS-W
OPEN SPACE SUBTOTAL		89.79		
CIRCULATION***	---	18.89***	---	
CIRCULATION SUBTOTAL:		18.89		
PROJECT TOTAL:	614	196.08	---	

*** CIRCULATION ACREAGE INCLUDES RIGHT OF WAY DEDICATIONS FOR OLD KELLER ROAD, KELLER ROAD, WINCHESTER ROAD, POURROY ROAD AND INTERNAL STREETS A, B, C, PORTION OF N, P, AND PORTION OF Q.

OWNER
FORESTAR (USA) LOS ANGELES HOLDING COMPANY INC.
2221 E. LAMAR BLVD., SUITE 790
ARLINGTON, TX 76006
ATTN: DANIEL C. BARTOK

APPLICANT
DR HORTON LOS ANGELES HOLDING COMPANY INC.

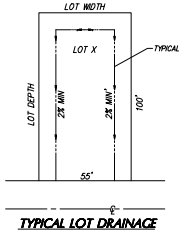
ENGINEER
RTM ENGINEERING CONSULTANTS, INC.
357 N. SHERIDAN STREET, SUITE 117
CORONA, CA 92880
PHONE: (951) 279-1800
PROJECT MANAGER: AMIR FALLAHI, P.E.

SOILS ENGINEER
GEOTEK, INC.
1548 NORTH MAPLE STREET
CORONA, CA 92878
ATTN: EDWARD H. LAMONT
PH: 951-710-1160

UTILITIES AND SERVICES

AGENCY SERVING THE AREA		FACILITIES PRESENT
ELECTRIC:	SOUTHERN CALIFORNIA EDISON	YES
GAS:	SOUTHERN CALIFORNIA GAS CO.	YES
TELEPHONE:	VERIZON	YES
CABLE TV:	FRONTIER/SPECTRUM	YES
WATER:	EASTERN MUNICIPAL WATER DISTRICT	YES
SEWER:	EASTERN MUNICIPAL WATER DISTRICT	YES
SCHOOL DIST:	MENIFEE UNION SCHOOL DISTRICT	---
	PERRIS UNION HIGH SCHOOL DISTRICT	---

LEGEND
TRACT BOUNDARY
PROPOSED PARCEL
PROP. R/W DEDICATION
DAYLIGHT LINE
EXISTING EASEMENT
EXISTING CONTOUR
PROPOSED CONTOUR
PROPOSED 2:1 SLOPE
LOT NUMBER 357
LETTERED LOT LOT 'M'
PROPOSED PAD ELEVATION P=66.3
EXISTING POWER POLE
PROPOSED STORM DRAIN SD
EXISTING STORM DRAIN SD
PROPOSED DOMESTIC WATER W
EXISTING DOMESTIC WATER W
PROPOSED RECYCLED WATER RW
PROPOSED SEWER S
PROPOSED SEWER S
PROP. RETAINING WALL
EXISTING STREET ROW TO BE VACATED
PROP. FIRE HYDRANT



TYPICAL LOT DRAINAGE
NTS

SHEET INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & GENERAL NOTES
2	PROJECT SUMMARY TABLES
3-6	TENTATIVE TRACT MAP
7-9	TYPICAL SECTIONS
10	EASEMENT MAP & NOTES

rtm engineering consultants
357 N. SHERIDAN STREET
SUITE 117
CORONA, CALIFORNIA 92880
TEL. (951) 279-1800
FAX (951) 279-4380

REVISIONS

REV	DATE	DESCRIPTION	APPROVED

COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
TITLE SHEET & GENERAL NOTES

Drawn By: JE/PY | Checked By: AF | Scales: AS SHOWN
PREPARED: JAN 26
DWG. NO. 1
SHEET OF 10 SHEETS

Drawing: G:\2019\2103_Drawings\ENGINEERING\Preliminary\TM\1NT - TM 38163 - SHT 001.dwg Layout: SHT 1 Saved: 1/31/2038 8:46 AM Plotted: 1/31/2038 4:23 PM Plot Scale: 1:40 By: Jason Le

SINGLE FAMILY HOMES LOT SUMMARY

LOT NO.	AREA (SF)	PAD AREA (SF)
1	5,274	4769
2	5,383	5383
3	5,529	4986
4	5,450	4910
5	5,450	4910
6	5,450	4670
7	5,450	4990
8	5,450	4830
9	5,450	4910
10	5,450	4910
11	5,450	4910
12	5,450	4930
13	5,450	4910
14	5,450	4950
15	5,450	4950
16	5,450	4870
17	5,450	4790
18	5,528	5034
19	7,227	6773
20	6,038	6038
21	6,524	6038
22	8,478	7810
23	7,012	6014
24	5,917	5360
25	5,954	5954
26	10,128	7271
27	9,479	7743
28	8,719	7978
29	6,527	5609
30	8,021	7464
31	7,479	5478
32	5,677	4613
33	6,659	5550
34	7,049	6145
35	8,809	8209
36	6,000	4920
37	6,000	5400
38	6,000	4920
39	6,109	5463
40	6,100	6100
41	6,897	6897
42	4,854	4854
43	4,490	4490
44	4,633	3564
45	4,714	3950
46	4,603	3471
47	4,566	3680
48	4,578	3368
49	4,529	3558
50	4,669	3992
51	4,436	3774
52	4,484	3709
53	6,217	5201
54	5,816	4143
55	4,973	4532
56	4,413	3896
57	4,321	3806
58	4,322	3807
59	4,370	3845
60	4,230	3704
61	4,557	4041
62	4,442	3958
63	4,608	4383
64	5,203	4987
65	7,263	7263
66	4,077	3289
67	4,297	3654
68	4,275	3778
69	4,275	3816
70	5,617	5033
71	4,914	4629
72	4,208	3922
73	5,321	4774
74	4,125	4125
75	4,130	4130
76	4,135	4135
77	4,139	4139
78	4,145	4144
79	4,248	4143
80	5,719	4119
81	4,900	3936
82	4,431	3923
83	5,307	4257
84	5,262	4558
85	4,860	4086

SINGLE FAMILY HOMES LOT SUMMARY

LOT NO.	AREA (SF)	PAD AREA (SF)
86	4,860	4108
87	4,860	4104
88	4,860	4095
89	4,860	4086
90	4,860	4011
91	5,255	4109
92	7,057	6507
93	6,337	5710
94	5,056	4400
95	4,500	3888
96	5,670	4983
97	4,451	4417
98	4,050	4050
99	4,050	4050
100	4,050	4050
101	4,050	4050
102	4,050	4050
103	4,175	4175
104	4,258	4258
105	4,072	4072
106	4,079	4079
107	4,061	4061
108	4,050	4050
109	4,050	4050
110	4,050	4050
111	4,087	4087
112	4,235	4235
113	4,365	4365
114	4,983	4983
115	4,382	4382
116	5,006	5006
117	5,824	5458
118	4,050	4050
119	4,050	4050
120	4,078	4078
121	4,225	4225
122	4,223	4223
123	4,223	3876
124	4,224	3739
125	4,222	3593
126	4,500	3741
127	4,500	3058
128	4,500	3346
129	4,500	3034
130	4,500	3628
131	4,500	3288
132	4,964	4244
133	4,600	4276
134	4,230	3816
135	4,230	3690
136	4,230	3726
137	4,230	3672
138	4,050	3564
139	4,050	3600
140	4,050	3528
141	4,062	3684
142	4,057	3499
143	4,059	3699
144	4,059	3644
145	4,057	4057
146	4,158	4158
147	4,050	4050
148	4,050	4050
149	5,362	4803
150	4,482	4482
151	4,236	4236
152	4,155	4196
153	4,115	4158
154	5,414	5414
155	4,688	4688
156	4,303	4303
157	4,082	4082
158	4,052	4052
159	4,050	4050
160	4,158	4158
161	4,129	4129
162	4,129	4129
163	4,129	3625
164	4,129	4129
165	4,181	3859
166	4,050	3890
167	4,050	3492
168	4,050	3654
169	4,050	4005
170	4,410	3978

SINGLE FAMILY HOMES LOT SUMMARY

LOT NO.	AREA (SF)	PAD AREA (SF)
171	4,410	3987
172	4,410	4410
173	5,373	5102
174	6,550	6550
175	4,435	4043
176	4,121	4121
177	3,995	3995
178	3,990	3990
179	3,665	3663
180	3,633	3663
181	3,600	3600
182	3,600	3600
183	3,600	3600
184	3,600	3600
185	3,600	3600
186	3,600	3600
187	3,600	3600
188	3,600	3600
189	4,972	3922
190	5,338	4219
191	3,680	3032
192	3,680	3072
193	3,680	3160
194	3,680	3160
195	3,680	3096
196	3,680	3168
197	3,764	3315
198	3,801	3427
199	3,825	3507
200	3,839	3630
201	3,834	3834
202	3,786	3786
203	3,635	3668
204	3,970	3938
205	3,905	3905
206	3,905	3506
207	3,987	3422
208	4,120	3368
209	4,989	4189
210	4,070	4070
211	4,075	4075
212	4,076	4076
213	4,075	4075
214	4,074	4074
215	3,709	3709
216	3,600	3600
217	3,600	3600
218	3,652	3652
219	3,844	3844
220	3,601	3601
221	3,600	3600
222	3,600	3600
223	3,600	3600
224	3,600	3600
225	4,355	3509
226	4,691	4067
227	3,933	3608
228	4,476	3649
229	6,769	6286
230	7,482	7454
231	4,542	4542
232	3,646	3646
233	3,865	3865
234	3,928	3928
235	3,873	3873
236	3,970	3479
237	5,595	5995
238	10,208	10208
239	4,103	4302
240	4,334	4334
241	4,076	4076
242	3,939	3939
243	3,837	3837
244	3,770	3770
245	3,738	3738
246	3,739	3739
247	3,868	3868
248	3,858	3858
249	3,827	3827
250	3,939	3939
251	3,785	3786
252	3,925	3926
253	4,347	3933
254	4,880	4880
255	5,404	5404

SINGLE FAMILY HOMES LOT SUMMARY

LOT NO.	AREA (SF)	PAD AREA (SF)
256	4,669	4669
257	4,129	4129
258	3,886	3886
259	3,965	3965
260	3,823	3823
261	3,850	3850
262	3,768	3768
263	3,803	3803
264	3,795	3795
265	4,682	4682
266	3,923	3923
267	4,936	3992
268	4,495	3741
269	4,390	4121
270	4,276	3657
271	4,153	3577
272	4,007	4007
273	3,685	3685
274	3,606	3606
275	3,656	3656
276	3,719	3719
277	3,787	3787
278	3,817	3817
279	3,821	3821
280	3,716	3716
281	3,720	3720
282	3,720	3720
283	3,720	3720
284	3,720	3720
285	4,505	3772
286	4,699	4385
287	3,795	3795
288	3,755	3755
289	3,600	3600
290	3,600	3600
291	4,202	4202
292	5,835	5122
293	4,466	3922
294	4,452	3900
295	4,459	3929
296	4,331	3793
297	4,473	3793
298	4,275	3709
299	4,420	3763
300	4,845	4094
301	4,908	4090
302	5,335	4396
303	5,641	4581
304	6,019	4847
305	6,359	4713
306	5,052	4220
307	4,631	3843
308	5,131	3468
309	5,125	3144
310	4,902	3120
311	4,609	2973
312	4,018	2851
313	4,040	2855
314	4,040	3148
315	4,040	3152
316	4,040	3108
317	4,040	3096
318	4,040	3092
319	4,040	3049
320	4,040	3038
321	4,040	2994
322	5,511	3493
323	5,924	5033
324	3,600	3600
325	3,600	3600
326	3,600	3600
327	3,600	3600
328	3,600	3600
329	3,600	3600
330	3,600	3600
331	3,600	3600
332	3,600	3600
333	4,477	4477
334	4,201	4201
335	4,714	4714
336	5,723	5723
337	5,911	5911
338	5,227	5227
339	4,748	4748
340	4,451	4451

SINGLE FAMILY HOMES LOT SUMMARY

LOT NO.	AREA (SF)	PAD AREA (SF)
341	4,323	4323
342	4,334	4334
343	4,201	4201
344	4,318	4318
345	3,902	3902
346	3,600	3600
347	3,600	3600
348	4,640	4589
349	5,628	5628
350	5,300	4820
351	5,300	5295
352	5,300	4500
353	5,300	5300
354	5,719	5127
355	5,903	4569
356	5,432	4627
357	5,470	4721
358	5,507	4759
359	5,433	4600
360	5,859	4615
361	6,532	6532
362	6,070	5314
363	5,991	5991
364	5,912	5153
365	5,846	5846
366	6,184	5925
367	6,282	4434
368	5,886	4730
369	5,872	4259
370	5,845	4755
371	5,818	4271
372	6,444	4968
373	5,210	5210
374	5,600	4980
375	5,600	5600
376	5,600	5020
377	5,600	5600
378	5,855	4976
379	6,116	4335
380	6,048	4912
381	6,048	4771
382	6,048	4384
383	6,048	4659
384	6,552	4541

OVERALL

SUM	1,805,942	1,645,030
MIN	3,600	2,851
MAX	10,208	10,208

DUPLEX LOTS LOT SUMARY

NO.	AREA (SQUARE FEET)
385	1,953
386	1,956
387	1,959
388	1,962
389	2,262
390	2,247
391	1,952
392	1,952
393	1,952
394	1,952
395	1,952
396	1,952
397	1,952
398	1,952
399	2,247
400	2,247
401	1,952
402	1,952
403	1,952
404	1,952
405	1,952
406	1,952
407	1,952
408	1,952
409	2,247
410	2,247
411	1,952
412	1,952
413	1,952
414	1,952
415	1,952
416	1,952
417	1,952
418	1,952
419	2,247
420	2,247
421	1,952
422	1,952
423	1,952
424	1,952
425	1,952
426	1,952
427	1,952
428	1,952
429	2,226
430	2,246
431	1,952
432	1,952
433	1,952
434	1,952
435	1,952
436	1,952
437	1,952
438	1,952
439	2,246
440	2,246
441	1,952
442	1,952
443	1,952
444	1,952
445	1,952
446	1,952
447	1,952
448	1,952
449	2,246
450	2,246
451	1,952
452	1,952
453	1,952
454	1,952
455	1,952
456	1,952
457	1,952
458	1,952
459	2,247
460	2,247
461	1,952
462	1,952
463	1,952
464	1,952
465	1,952
466	1,952
467	1,952
468	1,952
469	2,247

DUPLEX LOTS LOT SUMARY

NO.	AREA (SQUARE FEET)
470	2,247
471	1,952
472	1,952
473	1,952
474	1,952
475	3,526
476	3,169
477	2,928
478	2,696
479	1,964
480	1,952
481	1,952
482	1,952
483	1,952
484	2,621
485	1,957
486	1,952
487	1,952
488	1,952
489	1,952
490	2,260
491	3,104
492	1,952
493	1,952
494	1,952
495	2,247
496	2,491
497	2,122
498	2,077
499	2,032
500	2,752
501	1,964
502	1,952
503	1,952
504	1,952
505	1,952
506	1,952
507	1,952
508	1,952
509	2,267
510	2,263
511	1,952
512	1,952
513	1,952
514	1,952
515	1,952
516	1,952
517	1,952
518	1,965
519	1,952
520	1,952
521	1,952
522	1,952
523	1,952
524	1,952
525	1,952
526	1,952
527	1,952
528	1,952
529	1,952
530	1,952
531	1,952
532	1,952
533	1,952
534	1,952
535	1,938
536	1,952
537	1,952
538	1,952
539	1,952
540	1,952
541	1,952
542	1,952
543	1,952
544	1,952
545	1,952
546	1,952
547	1,952
548	1,952
549	1,952
550	1,952
551	1,952
552	1,952
553	1,952
554	1,978

DUPLEX LOTS LOT SUMARY

NO.	AREA (SQUARE FEET)
555	1,952
556	1,952
557	1,952
558	1,952
559	1,952
560	1,952
561	1,952
562	1,952
563	1,952
564	1,952
565	1,952
566	1,952
567	1,952
568	1,952
569	1,952
570	1,952
571	1,952
572	1,952
573	1,952
574	1,952
575	2,005
576	1,990
577	1,975
578	1,960
579	1,952
580	1,952
581	1,952
582	1,952
583	1,952
584	1,952
585	1,952
586	1,952
587	1,952
588	1,952
589	1,952
590	1,952
591	1,952
592	1,952
593	1,952
594	1,952
595	1,952
596	1,952
597	1,952
598	1,952
599	1,952
600	1,952
601	1,952
602	1,952
603	1,952
604	1,952
605	1,952
606	1,952
607	1,952
608	1,952
609	1,952
610	1,952
611	2,015
612	2,015
613	2,018
614	2,023

OVERALL

SUM	463,993
MIN	1,938
MAX	3,526

OPEN SPACE LOT SUMMARY

NO.	AREA (SQUARE FEET)	PURPOSE
615	2,641,387	CONSERVATION
616	157,036	LANDSCAPE
617	139,858	LANDSCAPE
618	79,689	LANDSCAPE
619	237,641	LANDSCAPE
620	386,822	PARK
621	8,919	LANDSCAPE
622	26,286	LANDSCAPE
623	700	LANDSCAPE
624	1,409	LANDSCAPE
625	7,876	LANDSCAPE
626	1,800	LANDSCAPE
627	11,723	LANDSCAPE
628	14,270	LANDSCAPE
630	4,065	EASEMENT
631	68,101	LANDSCAPE

OVERALL

SUM	3,795,272

BASINS LOT SUMMARY

NO.	AREA (SQUARE FEET)
629	16,650
632	9,280
633	156,729
634	224,887
635	180,410

OVERALL

SUM	587,956

PRIVATE ALLEYS LOT SUMMARY

ALLEY	AREA (SF)
A	53,821
B	4,265
C	6,514
D	4,263
E	4,263
F	4,265
G	4,265
H	6,513
I	4,265
J	4,265
K	6,274
LL	4,264
M	4,920
NN	4,920
O	3,691
P	3,691
Q	4,920
R	40,564
S	8,877
T	8,667
U	8,478
V	4,265
W	4,663
X	3,459
Y	5,605

OVERALL

SUM	213,957

LETTERED LOTS OPEN SPACE LOT SUMMARY

NO.	AREA (SQFT)
AA	5,945
BB	97,216
CC	1,073
DD	1,972
EE	5,647
FF	7,832
GG	1,063
HH	1,755
II	1,063
JJ	4,773
KK	431
LL	2,682
MM	2,889
NN	2,889
OO	6,664
PP	2,948
QQ	1,073
RR	1,073
SS	2,889
TT	1,675
UU	542
VV	1,007
WW	2,557
XX	1,795
YY	1,073
ZZ	318
AAA	6,627
BBB	3,547

OVERALL

SUM	171,018

rtm engineering consultants
357 N. SHERIDAN STREET
SUITE 117
CORONA, CALIFORNIA 92880
TEL (951) 279-1800
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COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163

SCHEDULE "A"

PROJECT SUMMARY

REV	DATE	DESCRIPTION	APPROVED
		REVISIONS	

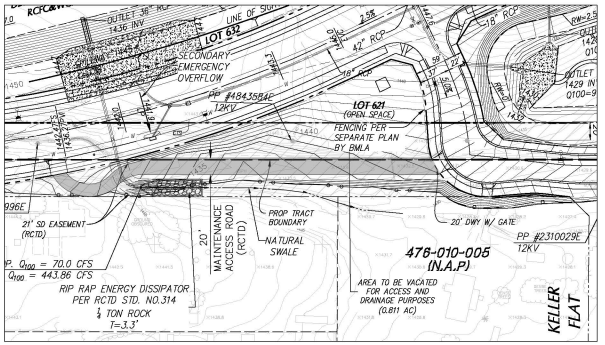
Drawn By JE/PY
Checked By AE
Scale: AS SHOWN
PREPARED: JAN 26
DWG. NO. 2
SHEET OF 10 SHEETS

Drawing: G:\GSR\LSD_Drawings\45360\Preliminary\TM 1407 - TM 38163 - SHT 002.dwg Layout: 36x42 L Saved: 1/25/2026 10:59 AM Plotted: 1/26/2026 4:24 PM Plot Scale: 1:48 By: Jason Le

IN THE COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163





LEGEND

MATCHLINE

PHASE LINE

NO OBSTRUCTION IN THE AREA OF LINE OF SIGHT TO EXCEED 3' HEIGHT

SCALE: 1"=80'

0 80 160 240 320

rtm engineering consultants

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REV	DATE	DESCRIPTION	APPROVED
		REVISIONS	

COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
TENTATIVE TRACT MAP

Drawn By: JE/PT
Checked By: AF
Scale: AS SHOWN
PREPARED: JAN 26

DWG. NO. 3
SHEET OF 10 SHEETS

IN THE COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163



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REV	DATE	DESCRIPTION	APPROVED
		REVISIONS	

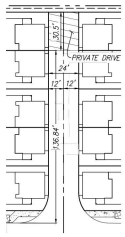
COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
TENTATIVE TRACT MAP

Drawn By: JE/PY
Checked By: AF
Scale: AS SHOWN
PREPARED: JAN 28
DWG. NO. 4
SHEET OF 10 SHEETS

IN THE COUNTY OF RIVERSIDE

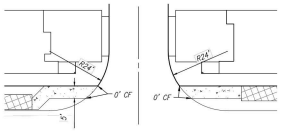
TENTATIVE TRACT MAP NO. 38163



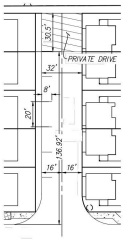
TYPICAL 24' DUPLEX ALLEY
SCALE: N.T.S
ALLEY: B, D, E, F, G, I, J, L, O, P, V, W, AND X
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.

PRIVATE DRIVEWAYS EXCLUSIVE TO LOTS ABUTTING ALLEY (MATERIAL TO BE DETERMINED DURING FINAL DESIGN)

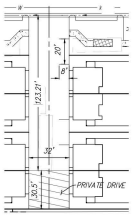
WATER METER BANK TO BE FINALIZED IN FINAL ENGINEERING



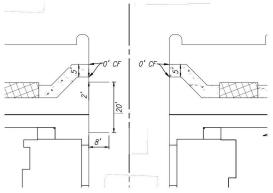
TYPICAL SIDEWALK LAYOUT
SCALE: N.T.S
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



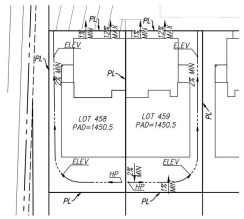
TYPICAL DUPLEX ALLEY PARKING 2
SCALE: N.T.S
ALLEY: Y AND K
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



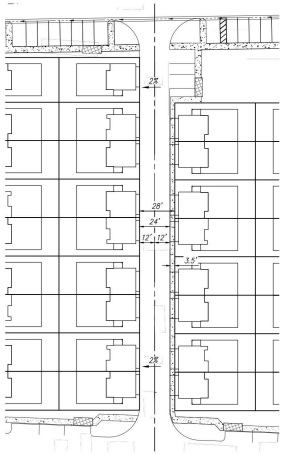
32' DUPLEX ALLEY
SCALE: N.T.S
ALLEY: M, N, AND Q
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



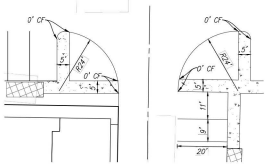
TYPICAL SIDEWALK WITH PARKING STALL
SCALE: N.T.S
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



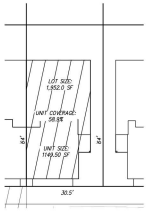
TYPICAL DUPLEX LOT DRAINAGE
SCALE: N.T.S
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



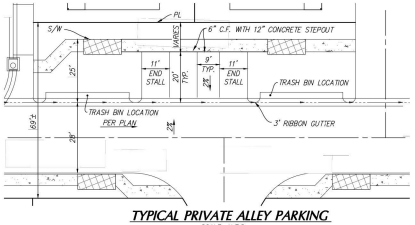
TYPICAL DUPLEX THROUGH
SCALE: N.T.S
ALLEY: S, T, AND U
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



TYPICAL SIDEWALK 2
SCALE: N.T.S
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



TYPICAL DUPLEX LOT COVERAGE
SCALE: N.T.S
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.



TYPICAL PRIVATE ALLEY PARKING
SCALE: N.T.S

LOT 615
OPEN SPACE
CONSERVATION
HABITAT
(N.A.P)

MSHCP

LOT 618 (OPEN SPACE)

LOT 619
CONGREGATE CARE

BASIN C - BIOFILTRATION BASIN
CONCEPT - PER FUTURE PLAN
INFLOW: Q100=30.5 CFS
OUTFLOW: Q100=5.4 CFS (MAX)
BASIN VOLUME

LOT 620 PARK

LOT 631 (OPEN SPACE)

LOT 632 (OPEN SPACE)

LOT 635
BIOFILTRATION BASIN
INFLOW: Q100=2.1 CFS
OUTFLOW: Q100=0.5 CFS (MAX)
BASIN VOLUME=4,900 CF

MATCHLINE

SEE SHEET NO. 4

SEE SHEET NO. 3

MATCHLINE STREET

K STREET

L STREET

M STREET

COVENTRY LANE

WINCHESTER ROAD (ST. HWY. 79)

KELLER ROAD

ACCESS ROAD

472-110-038 (N.A.P)

472-110-022 (N.A.P)

472-110-031 (N.A.P)

476-010-060 (N.A.P)

476-010-058 (N.A.P)

	MULTIPLIER	COUNT	REQUIRED PARKING
DUPLEX	2.75	230	633

PARKING PROVIDED	MULTIPLIER	COUNT	PROVIDED PARKING
OFF-SITE	1	156	156
FULL DRIVEWAY (UNITS 475, 476, 477, 478)	2	4	8
ADA	1	18	18
GARAGE	2	230	460
TOTAL		230	642

LEGEND
MATCHLINE
PHASE LINE

SCALE: 1"=80'
0 80 160 240 320

NOTES:
ALL ALLEYS TO BE PRIVATELY MAINTAINED.
FOOTPRINT PLOTTINGS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY AND NOT FOR APPROVAL.

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REVISIONS

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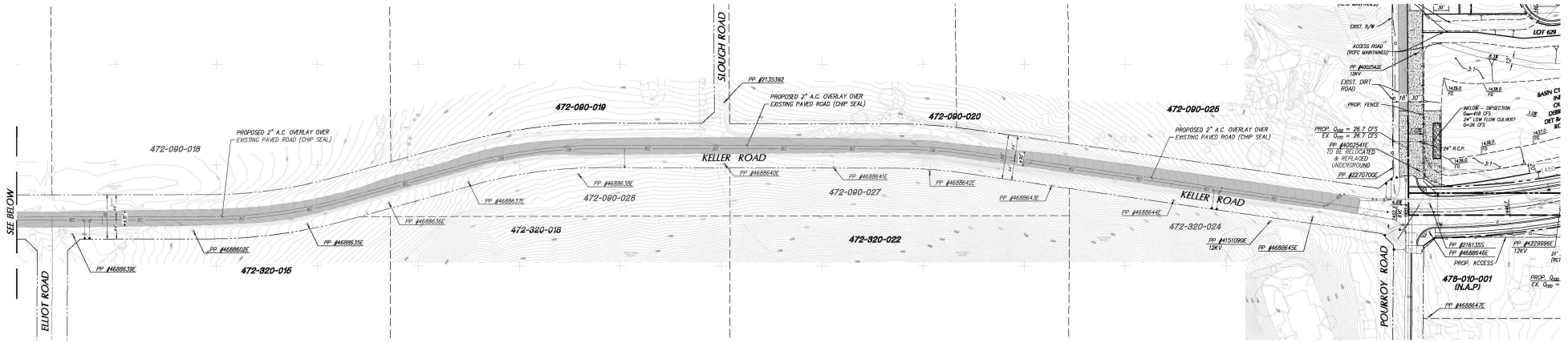
COUNTY OF RIVERSIDE

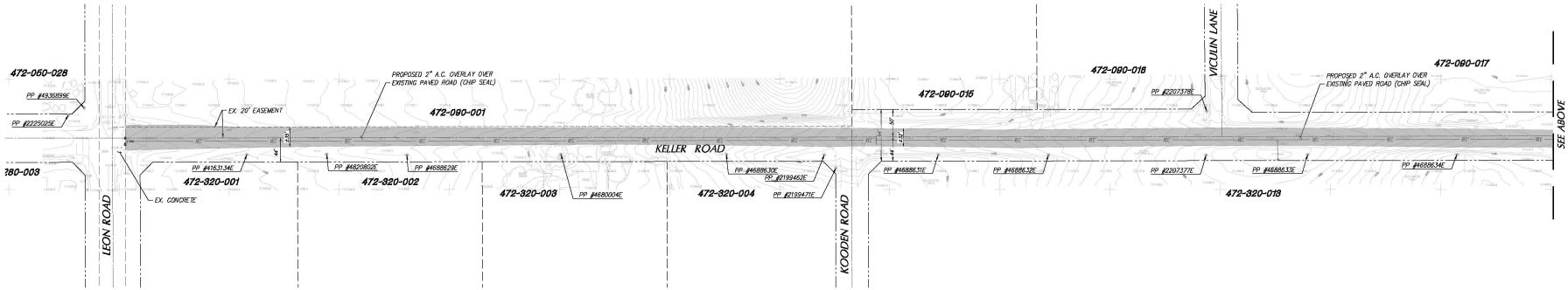
TENTATIVE TRACT MAP
NO. 38163
SCHEDULE "A"
TENTATIVE TRACT MAP

Drawn By JE/PY | Checked By AE | Scale: AS SHOWN | PREPARED: JAN 26 | DWG. NO. 5 | SHEET OF 10 SHEETS

IN THE COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163





SCALE: 1"=80'

0 80 160 240 320

LEGEND

MATCHLINE

PHASE LINE

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REV.	DATE	DESCRIPTION	APPROVED
		REVISIONS	

COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
TENTATIVE TRACT MAP

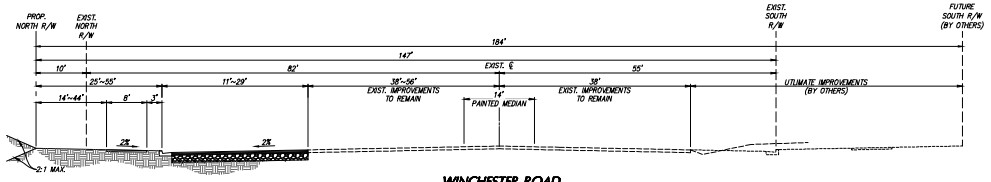
Drawn By: JE/PT
Checked By: AF
Scale: AS SHOWN

PREPARED: JAN 26

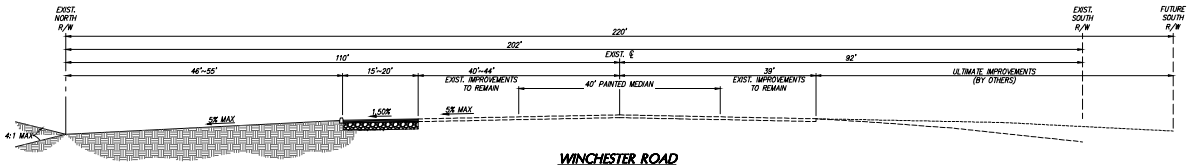
DWG. NO. 6
SHEET OF 10 SHEETS

IN THE COUNTY OF RIVERSIDE

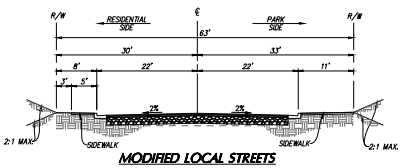
TENTATIVE TRACT MAP NO. 38163



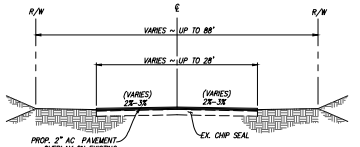
WINCHESTER ROAD
SCALE: 1"=10'
FROM KELLER ROAD TO 1/2 MILE NORTH OF INTERSECTION
6-LANE EXPRESSWAY
STD. NO. 85 (MODIFIED)



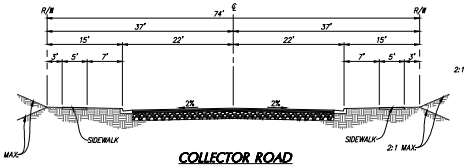
WINCHESTER ROAD
SCALE: 1"=10'
FROM 1/2 MILE NORTH OF KELLER RD TO PROJECT BOUNDARY
6-LANE EXPRESSWAY
STD. NO. 84 (MODIFIED)



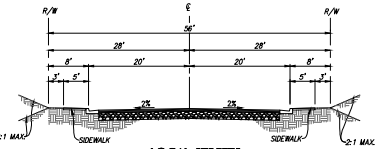
MODIFIED LOCAL STREETS
TYPICAL SECTION
SCALE: 1"=10'
INTERIOR LOCAL STREETS – STD. NO. 105, SECTION A (MODIFIED)
"C" STREET (FROM "K" TO "J") &
"F" STREET (FROM "L" TO "B")
"L" STREET



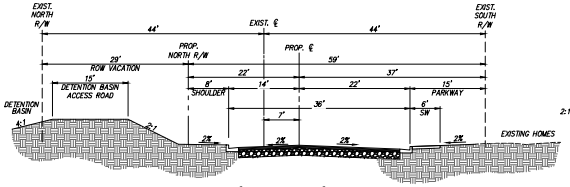
KELLER ROAD
NTS
POURROY ROAD TO LEON ROAD



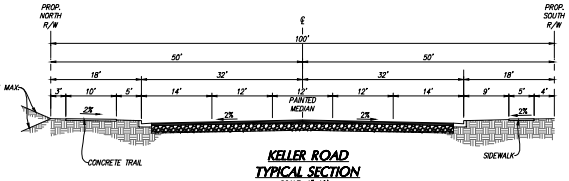
COLLECTOR ROAD
TYPICAL SECTION
SCALE: 1"=10'
INTERIOR LOCAL STREETS – STD. NO. 103
"B" STREET



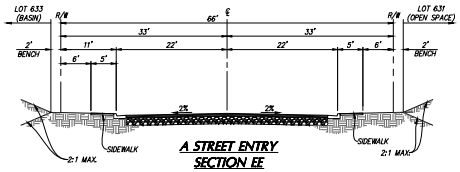
LOCAL STREETS
TYPICAL SECTION
SCALE: 1"=10'
INTERIOR LOCAL STREETS – STD. NO. 105, SECTION A (MODIFIED)
"A" STREET, "C" STREET ("L"-"J" STREET), "D" STREET, "F" STREET (WEST OF "L" STREET), "G" STREET, "H" STREET, "J" STREET, "K" STREET, "N" STREET, "O" STREET, AND "P" STREET



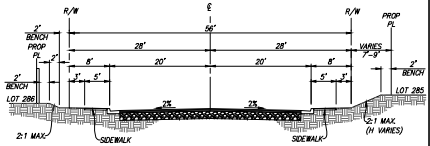
OLD KELLER ROAD
TYPICAL SECTION
SCALE: 1"=10'
COLLECTOR ROAD
STD. NO. 107A



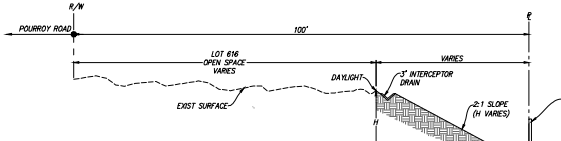
KELLER ROAD
TYPICAL SECTION
SCALE: 1"=10'
SECONDARY HIGHWAY
STD. NO. 84 (MODIFIED)



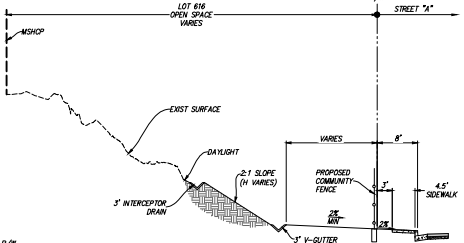
A STREET ENTRY
SECTION EE
SCALE: 1"=10'
SEE SHEET 3



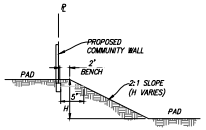
LOCAL STREETS
TYPICAL SECTION
SCALE: 1"=10'
INTERIOR LOCAL STREETS – STD. NO. 105, SECTION A (MODIFIED)
"M" STREET



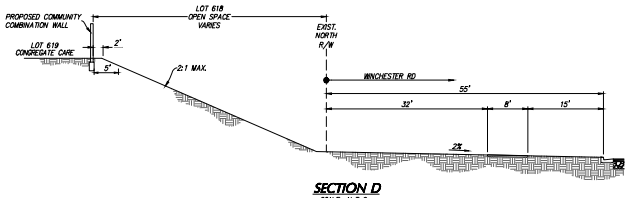
SECTION A
SCALE: N.T.S
SEE SHEET 3



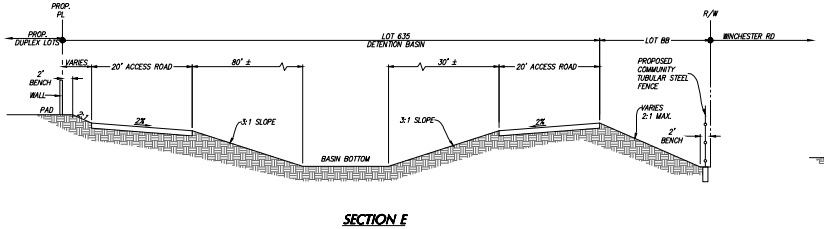
SECTION B
SCALE: N.T.S
SEE SHEET 3



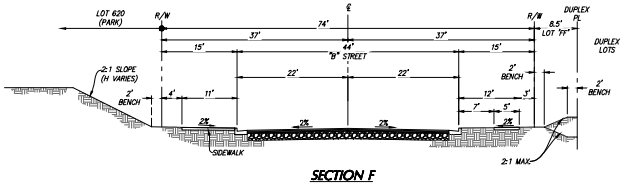
SECTION C
SCALE: N.T.S
SEE SHEET 3



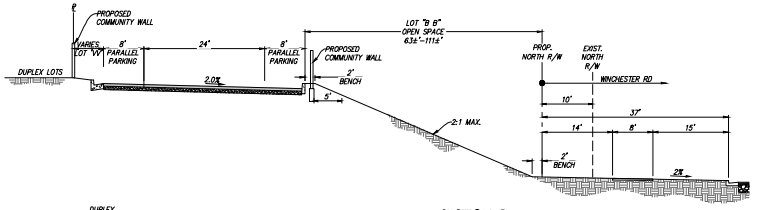
SECTION D
SCALE: N.T.S
SEE SHEET 5



SECTION E
SCALE: N.T.S
SEE SHEET 5



SECTION F
SCALE: N.T.S
SEE SHEET 5



SECTION G
SCALE: N.T.S
SEE SHEET 5

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COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
TYPICAL SECTIONS

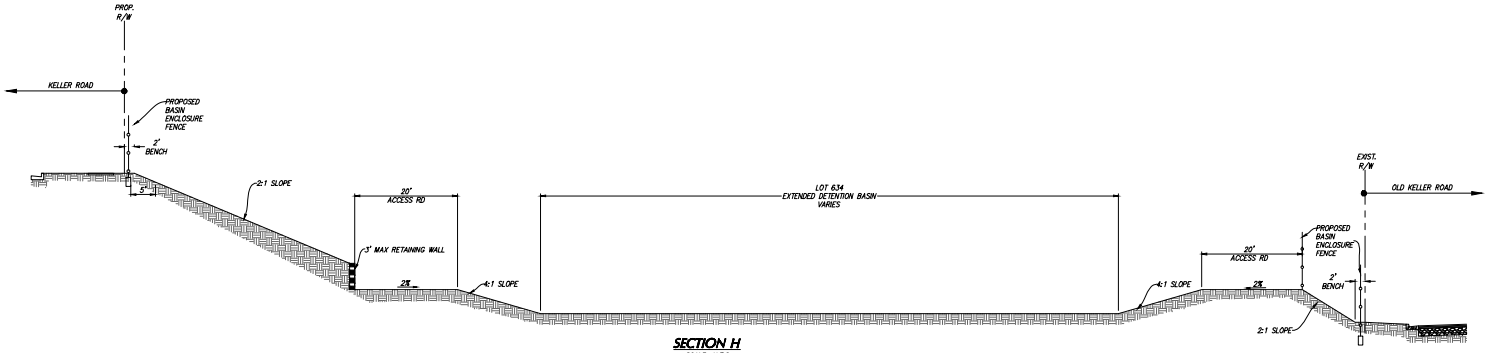
REV	DATE	DESCRIPTION	APPROVED
		REVISIONS	

Drawn By: JC/PY
Checked By: AE
Scale: AS SHOWN
PREPARED: JAN 26
DWG. NO. 7
SHEET OF 10 SHEETS

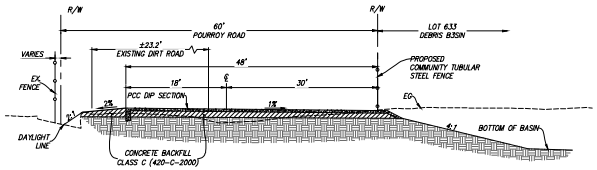
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IN THE COUNTY OF RIVERSIDE

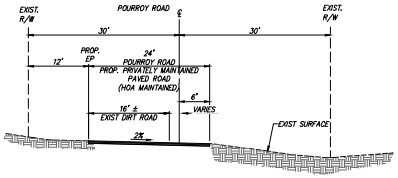
TENTATIVE TRACT MAP NO. 38163



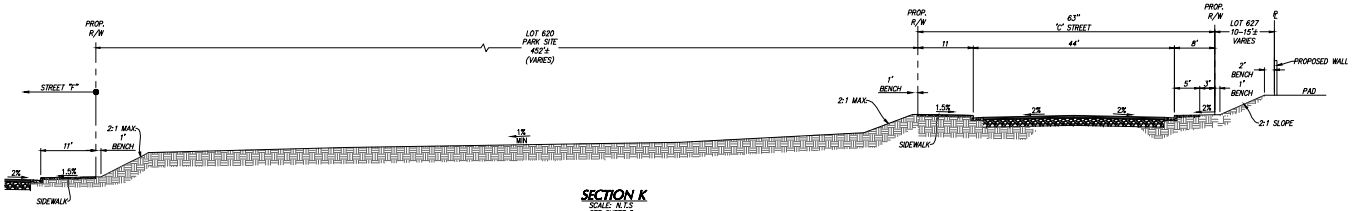
SECTION H
SCALE: N.T.S
SEE SHEET 3



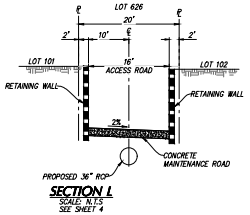
SECTION I
SCALE: N.T.S
SEE SHEET 3



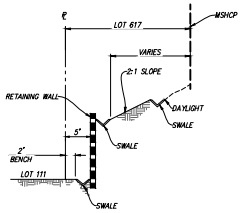
SECTION J
SCALE: N.T.S
SEE SHEET 3



SECTION K
SCALE: N.T.S
SEE SHEET 3



SECTION L
SCALE: N.T.S
SEE SHEET 4



SECTION M
SCALE: N.T.S
SEE SHEET 4

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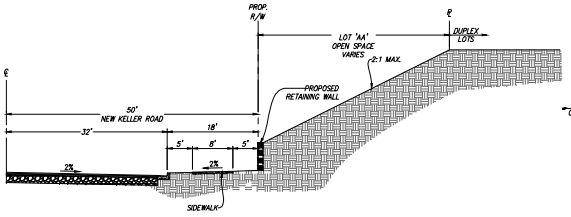
COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
TYPICAL SECTIONS

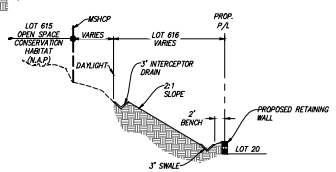
Drawn By: JC/PY
Checked By: AF
Scale: AS SHOWN
PREPARED: JAN 26
DWG. NO. 8
SHEET OF 10 SHEETS

IN THE COUNTY OF RIVERSIDE

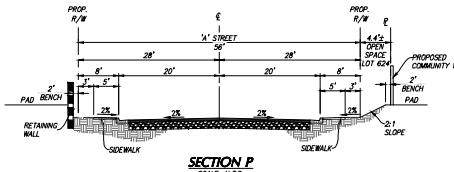
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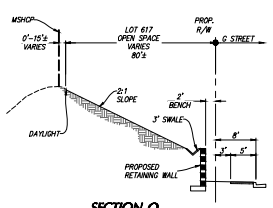
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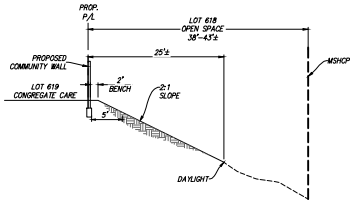
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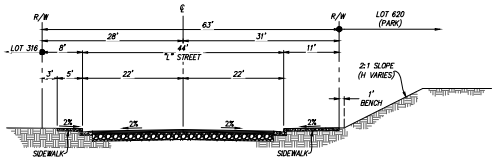
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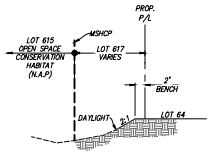
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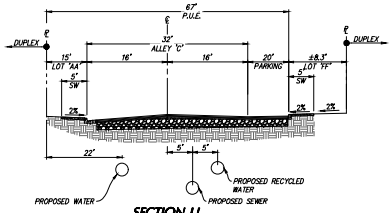
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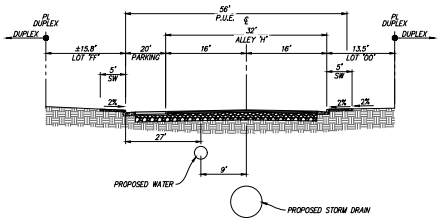
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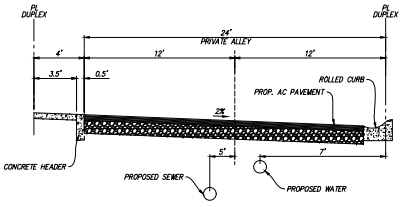
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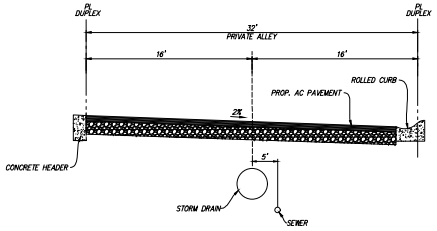
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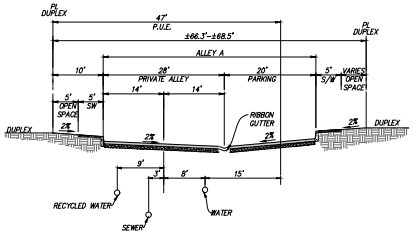
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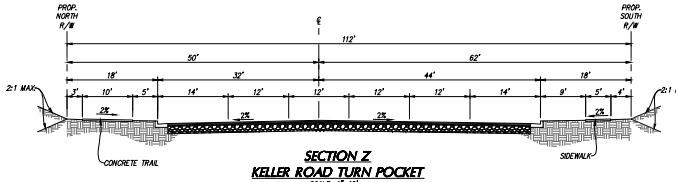
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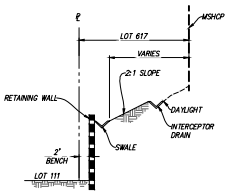
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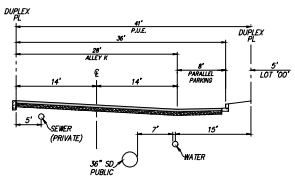
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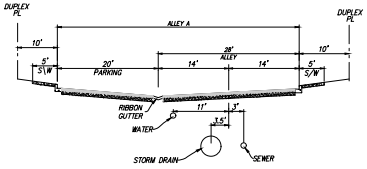
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STD. NO. 94 (MODIFIED)
SEE SHEET 3



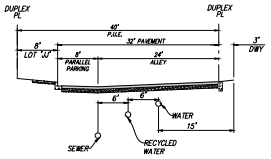
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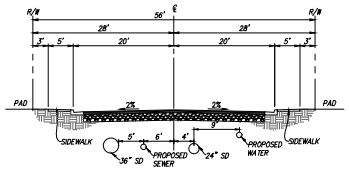
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SECTION CC
SCALE: N.T.S
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SECTION DD
SCALE: N.T.S
SEE SHEET 5



G STREET
SECTION FF
SCALE: 1"=10'
SEE SHEET 4

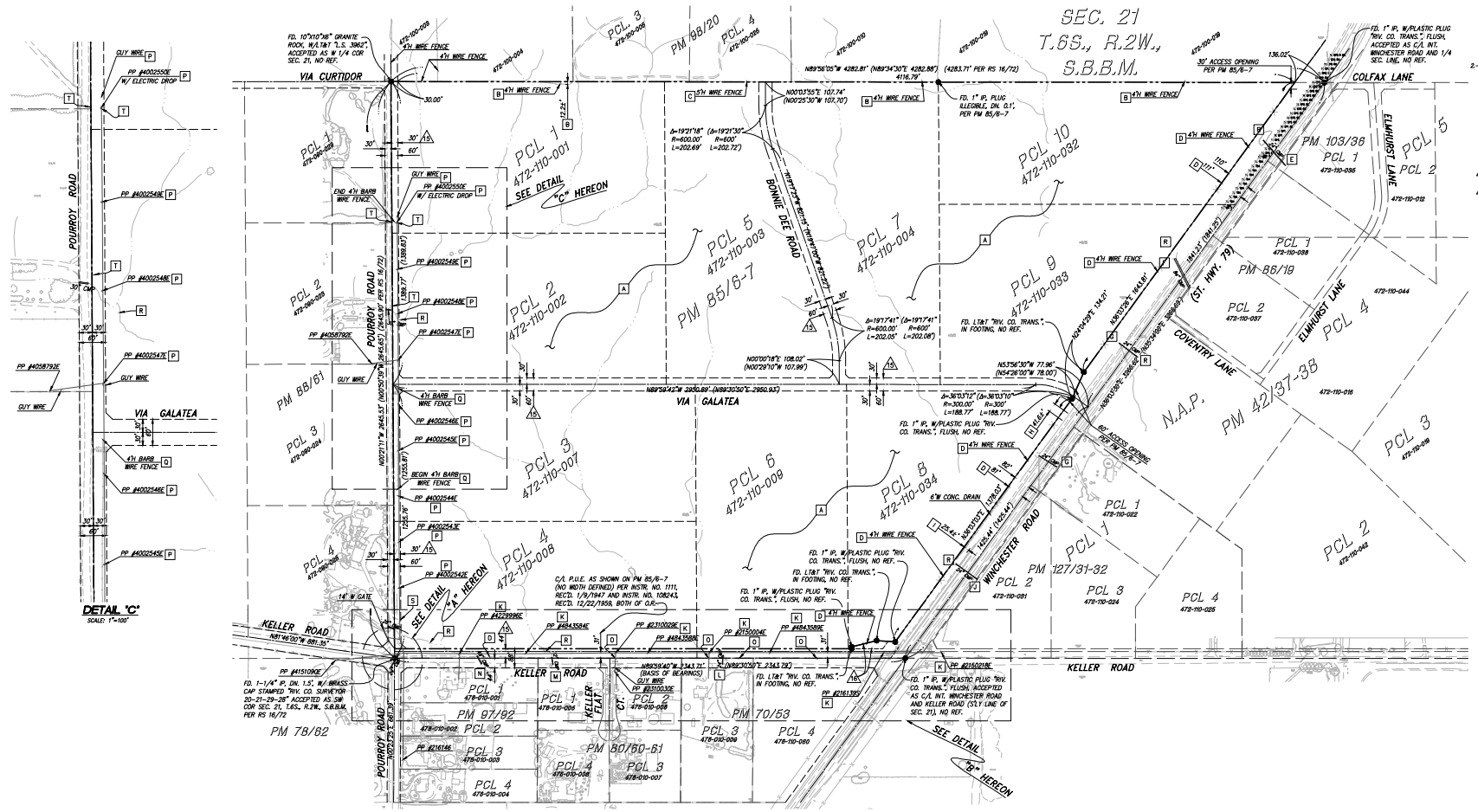
rtm engineering consultants
357 N. SHERIDAN STREET
SUITE 117
CORONA, CALIFORNIA 92880
TEL. (951) 279-1800
FAX (951) 279-4380

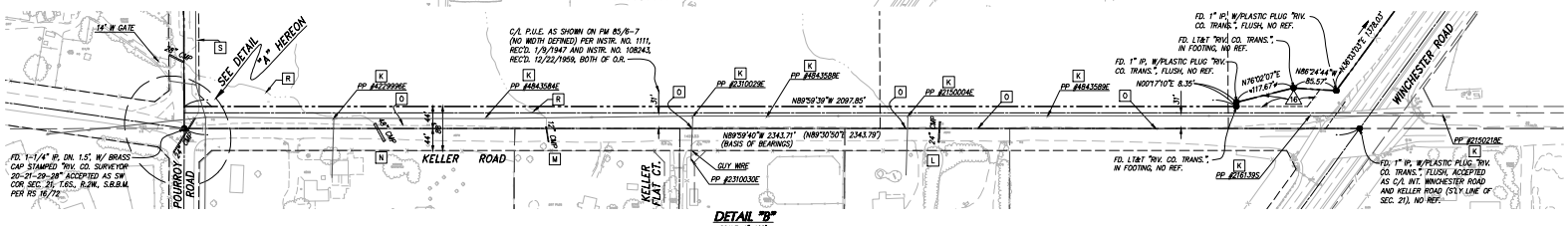
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		REVISIONS	

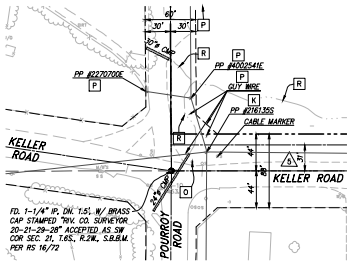
COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
TYPICAL SECTIONS

Drawn By: JC/PY
Checked By: AF
Scale: AS SHOWN
PREPARED: JAN 26
DWG. NO. 9
SHEET OF 10 SHEETS







EXCEPTIONS AND EXCLUSIONS:

THE PROPERTY COVERED BY THIS SURVEY IS DESCRIBED IN A TITLE REPORT PREPARED BY FIRST AMERICAN TITLE COMPANY ORDER NO. OSA-5864965 (29), DATED JUNE 02, 2020 AT 7:30 A.M.

1. GENERAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2020-2021, A LIEN NOT YET DUE OR PAYABLE.
2.-11. GENERAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2019-2020, PAYMENTS MADE.
12. THE LIEN OF SPECIAL TAX ASSESSED PURSUANT TO CHAPTER 2.5 COMMENCING WITH SECTION 53311 OF THE CALIFORNIA GOVERNMENT CODE FOR COMMUNITY FACILITIES DISTRICT 92-1 (PERRIS UNION HIGH SCHOOL DISTRICT), AS DISCLOSED BY NOTICE OF SPECIAL TAX LIEN RECORDED JANUARY 25, 1993 AS INSTRUMENT NO. 28785 OF OFFICIAL RECORDS.
13. THE LIEN OF SUPPLEMENTAL TAXES, IF ANY, ASSESSED PURSUANT TO CHAPTER 3.5 COMMENCING WITH SECTION 75 OF THE CALIFORNIA REVENUE AND TAXATION CODE.
14. ABUTTER'S RIGHTS OF INGRESS AND EGRESS TO OR FROM WINCHESTER ROAD, HAVE BEEN DEDICATED OR RELINQUISHED ON THE FILED MAP OF PARCEL MAP NO. 15244, EXCEPTING ONE 30' OPENING AS TO PARCEL 10 AND ONE 60' OPENING AS TO PARCELS 8 AND 9.

A AN EASEMENT FOR ROAD AND INCIDENTAL PURPOSES DEDICATED TO THE COUNTY OF RIVERSIDE ON THE MAP OF PARCEL MAP NO. 15244.

A AN EASEMENT FOR PUBLIC ROAD, DRAINAGE, INCLUDING PUBLIC UTILITY AND PUBLIC SERVICES AND INCIDENTAL PURPOSES IN FAVOR OF THE COUNTY OF RIVERSIDE, RECORDED NOVEMBER 18, 2010 AS INSTRUMENT NO. 2010-0556118, OF OFFICIAL RECORDS.

SURVEYORS NOTES AND LEGEND:

( ) INDICATES RECORD DATA PER PM 85/6-7, UNLESS OTHERWISE NOTED.

● INDICATES FOUND MONUMENT AS NOTED.

- FENCE AS NOTED
- EDGE OF PAVEMENT
- INDICATES RESTRICTED ACCESS AS SHOWN HEREON
- SIGN
- POWER POLE
- GUY ANCHOR
- TELEPHONE/ELECTRIC RISER/PEDESTAL
- MAIL BOX
- METER
- CMP CORRUGATED METAL PIPE
- ø DIAMETER
- R/W RIGHT OF WAY

ENCROACHMENTS AND OBSERVATIONS:

A THE FACT THAT DISCING HAS BEEN OBSERVED ONSITE.

B THE FACT THAT A 4' HIGH WIRE FENCE ENCROACHES UP TO 12.2'± ONSITE ALONG THE NORTHERLY PROPERTY LINE AS SHOWN HEREON.

C THE FACT THAT A 5' HIGH WIRE FENCE ENCROACHES UP TO 0.5'± ONSITE ALONG THE NORTHERLY PROPERTY LINE AS SHOWN HEREON.

D THE FACT THAT A 4' HIGH WIRE FENCE HAS BEEN OBSERVED 1.0'± NORTHWESTERLY TO 1.3'± SOUTHEASTERLY ON THE NORTHWESTERLY R/W LINE WINCHESTER ROAD (82.00 TO 110.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

E THE FACT THAT A 24" ø CMP CULVERT HAS BEEN OBSERVED WITHIN THE R/W OF WINCHESTER ROAD (110.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

F THE FACT THAT A 84" ø CMP CULVERT AND AN OPENING IN THE 4' HIGH WIRE FENCE HAS BEEN OBSERVED WITHIN THE R/W OF WINCHESTER ROAD (110.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

G THE FACT THAT A 24" ø CMP CULVERT HAS BEEN OBSERVED WITHIN THE R/W OF WINCHESTER ROAD (82.00 TO 110.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

H THE FACT THAT A 41.6'± OPENING IN THE 4' HIGH WIRE FENCE HAS BEEN OBSERVED WITHIN THE R/W OF WINCHESTER ROAD (82.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

I THE FACT THAT A STREET NAME SIGN LIES WITHIN THE R/W OF WINCHESTER ROAD (82.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

J THE FACT THAT A 24" ø CMP CULVERT HAS BEEN OBSERVED WITHIN THE R/W OF WINCHESTER ROAD (82.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

K THE FACT THAT A SERIES OF POWERPOLES WITH CROSSARMS AND POWERLINES RUNNING THROUGH THEM HAVE BEEN OBSERVED WITHIN THE NORTHERLY R/W OF KELLER ROAD (44.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

L THE FACT THAT A 24" ø CMP CULVERT HAS BEEN OBSERVED WITHIN THE R/W OF KELLER ROAD (44.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

M THE FACT THAT A 12" ø CMP CULVERT HAS BEEN OBSERVED WITHIN THE R/W OF KELLER ROAD (44.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

N THE FACT THAT A 48" ø CMP CULVERT HAS BEEN OBSERVED WITHIN THE R/W OF KELLER ROAD (44.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

O THE FACT THAT 3' HIGH TELEPHONE RISERS HAVE BEEN OBSERVED WITHIN THE R/W OF KELLER ROAD (44.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

P THE FACT THAT A SERIES OF POWERPOLES WITH CROSSARMS, POWERLINES RUNNING THROUGH THEM AND GUYWIRES HAVE BEEN OBSERVED WITHIN THE EASTERLY R/W OF POURROY ROAD (30.00 FEET IN HALF-WIDTH) AND ENCROACH (OVERHANG) ONTO SAID PROPERTY UP TO 1.5'± AS SHOWN HEREON.

Q THE FACT THAT 4' HIGH BARB WIRE FENCE (IN POOR CONDITION) HAS BEEN OBSERVED WITHIN THE EASTERLY R/W OF POURROY ROAD (30.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

R THE FACT THAT NATURAL DRAINAGE SWALES HAVE BEEN OBSERVED ONSITE RUNNING TO EXISTING CMP CULVERTS AS SHOWN HEREON.

S THE FACT THAT A DIRT ROAD SHOWS POSSIBLE ACCESS TO SAID PROPERTY AS SHOWN HEREON.

T THE FACT THAT 3' HIGH TELEPHONE RISERS HAVE BEEN OBSERVED WITHIN THE R/W OF POURROY ROAD (30.00 FEET IN HALF-WIDTH) AS SHOWN HEREON.

SCALE: 1"=200'
0 200 400 600 800

rtm engineering consultants
357 N. SHERIDAN STREET
SUITE 117
CORONA, CALIFORNIA 92880
TEL. (951) 279-1800
FAX (951) 279-4380

REV	DATE	DESCRIPTION	APPROVED
		REVISIONS	

COUNTY OF RIVERSIDE

TENTATIVE TRACT MAP NO. 38163
SCHEDULE "A"
EASEMENT MAP & NOTES

Drawn By JE/PY | PREPARED: JAN 28
Checked By AF | DWG. NO. 10
Scale: AS SHOWN | SHEET OF 10 SHEETS

Drawing: G:\SGP\LSD_Drawings\483001\Preliminary\TM1307 - TM 38163 - SHT 10.dwg Layout: SHT 10 Saved: 1/15/2026 9:33 AM Plotted: 1/15/2026 9:33 PM Plot Scale: 1=10 By: Jason La

Appendix 3: Soils Information

Geotechnical Study, Other Infiltration Testing Data, and/or Other Documentation

Examples of material to provide in Appendix 3 may include but are not limited to the following:

- Geotechnical Study/Report prepared for the project,
- Additional soils testing data (if not included in the Geotechnical Study),
- Exhibits/Maps/Other Documentation of the Hydrologic Soils Groups (HSG)s at the project site.

This information should support the Full Infiltration Applicability, and Biofiltration Applicability sections of this Template. Refer to Section 2.3 of the SMR WQMP and Sections A and D of this Template.

The County will accept explicit recommendations from the Geotechnical Engineer, such as specifying a design infiltration rate (unfactored) when infiltration rates vary, recommendations for impermeable liners due to concerns about seepage in fill areas/near gas tanks, or other site specific recommendations based on physical conditions.

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

Examples of material to provide in Appendix 4 may include but are not limited to the following:

- Environmental Site Assessments conducted for the project,
- Other information on Past Site Use that impacts the feasibility of LID BMP implementation on the site.

This information should support the Full Infiltration Applicability, and Biofiltration Applicability sections of this Template. Refer to Section 2.3 of the SMR WQMP and Sections D of this Template.

U.S. Fish and Wildlife Service
National Wetlands Inventory

KELLER CROSSING - US FISH & WILDLI



November 19, 2020

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix 5: LID Feasibility Supplemental Information

Information that supports or supplements the determination of LID technical feasibility documented in Section D

Examples of material to provide in Appendix 5 may include but are not limited to the following:

- Technical feasibility criteria for DMAs
- Site specific analysis of technical infeasibility of all LID BMPs (if Alternative Compliance is needed)
- Documentation of Approval criteria for Proprietary Biofiltration BMPs

This information should support the Full Infiltration Applicability, and Biofiltration Applicability sections of this Template. Refer to Section 2.3 of the SMR WQMP and Sections D of this Template.

Proprietary Biofiltration Criteria

The applicant shall provide documentation of compliance with each criterion in this checklist as part of the project submittal. Proprietary Biofiltration BMPs shall not be proposed if the BMP will accept undeveloped off-site tributary flows, where potential silt/sediment could clog or otherwise negatively impact the BMP.

1	**All BMPs must be sited/designed with the max. feasible infiltration/evapotranspiration[6].**	
	Requirement	Response
1a	What was the development status of the site prior to project application (i.e. raw ungraded land, or redevelopment with existing graded conditions)? – There will be more expectations to infiltrate if the project is a new development.	Raw ungraded conditions.
1b	History of design discussions/coordination for the site proposed project, resulting in the final design determination (i.e. infiltration vs. flow-thru):	The project site is in Type Soils B, C and D.
1c	The consideration of site design alternatives to achieve infiltration or partial infiltration on site;	Average infiltration rate = 0.09 in/hr in Area B and 0.06 in/hr in Area C.
1d	The physical impairments (i.e., fire road egress, public safety considerations, sewer lines, etc.) and public safety concerns (impermeable liners only to avoid geotech or contamination issues);	N/A
1e	The extent low impact development BMP requirements were included in the project site design (site design worksheets can be attached).	Site design BMP worksheet is included.
1f	When in the development process (e.g. entitlement or plan check, with dates of geotechnical work and development approval dates) did a geotechnical engineer analyze the site for infiltration feasibility?	N/A
1g	What was the scope of the geotechnical testing?	
1h	What are Public Health and Safety requirements that affect infiltration locations?	None
1i	What are the conclusions and recommendations from the geotechnical engineer, in regards to infiltrating/retaining on-site or allowing some or all of the flows to flow-thru as a proprietary BMP?	
1j	How will the proposed proprietary biofiltration BMPs achieve maximum feasible retention	Using both filtration and available infiltration.

[6] To address San Diego Regional Board letter dated April 28, 2017 regarding documentation to support infeasibility to retain or infiltrate storm water on-site. This document will be used to meet the Regional Board requirements for documentation. As such, not apply or non-responses will not be accepted.

	(evapotranspiration and infiltration) of the water quality volume, as required by MS4 Permits?	

2	**Proprietary Biofiltration BMP sizing (all proprietary/compact BMPs require TAPE approval)[7]**	
	Requirement	Response
2a	Use Table F-1 and F-2 of the WQMP template to identify and list all the pollutants of concern.	N/A
2b	Attached Active Technology Acceptance Protocol-Ecology (TAPE) certification, with General Use Level Designation (GULD) for all of applicable pollutants of concern	Yes _____ or No_____
2c	The most restrictive loading rates outlined in TAPE GULD approval[8] for all of the pollutants of concern.	
2d	Attach calculations, and all relevant steps to show that the sizing of the proprietary BMP is based on the flowrate (or volume) used to obtain TAPE/GULD approval (the most restrictive rate).	Yes _____ or No_____
2e	Are the infiltration rates are outlet controlled (e.g., via an underdrain and orifice/weir) or controlled by the infiltration rate of the media? Faster infiltration rates thru the media tend to reduce O&M issues.	Is the design infiltration rate controlled by the outlet? Yes _____ or No_____ If No, provide the rates for the outlet and the media and explain why outlet control is not practicable.
2f	Does the water surface drains to at least 12 inches below the media surface within 24 hours from the end of storm event flow to preserve plant health and promote healthy soil structure?	Yes _____ or No_____

3	**Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.**	
	Requirement	Response
3a	Plants tolerant of project climate, design ponding depths and the treatment media composition.	Provide documentation justifying plant selection.[9]

[7] Full scale field testing data that has been verified by Washington Department of Ecology and General Use Level Designation is required. https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies. Otherwise, the County has no obligation to accept the use of any other proprietary flow-thru BMP. Additional guidance can be found at the end of this checklist from the San Diego BMPDM Appendix F.1 for other verified third-party, field scale testing performance criteria that does not meet the Washington Department of Ecology standards.

[8] E.g. if the BMP was certified/verified with 100 gallons per minute treatment rate, the BMP shall be sized with no more than the equivalent rate).

[9] See Appendix E.20 of the San Deigo BMPDM for initial plan list for consideration for Riverside County.

3b	Plants that minimize irrigation requirements.	Provide documentation describing irrigation requirements for establishment and long term operation.
3c	Plant location and growth will not impede expected long-term media filtration rates and will enhance long-term infiltration rates to the extent possible.	Provide documentation justifying plant selection.[4]
3d	If plants are not applicable to the biofiltration design, other biological processes are supported as needed to sustain treatment processes (e.g., biofilm in a subsurface flow wetland). TAPE GULD approval that identifies approval with and without plants can be submitted for approval.	For biofiltration designs without plants, describe the biological processes that will support effective treatment and how they will be sustained.

4	**Biofiltration BMPs must be designed with a hydraulic loading rate to prevent erosion, scour, and channeling within the BMP. Erosion, scour, and/or channeling can disrupt treatment processes and reduce effectiveness.**	
	Requirement	Response
4a	What pre-treatment devices (e.g. vegetated buffers, catch basin inserts) and designs (e.g. forebay berms with cutouts) are proposed?	Catch Basin insert
4b	Adequate scour protection has been provided for both sheet flow and pipe inflows to the BMP.	
4c	Where scour protection has not been provided, flows into and within the BMP are kept to non-erosive velocities.	What are the maximum velocities for sheet flow and pipe inflows into the BMP?
4d	The BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification (e.g. maximum tributary area, maximum inflow velocities, etc.).	Manufacturer Requirements vs. the Design
4e	To preserve permeability, the media should have substantial void ratios and avoidance of choking layers.	Provide media gradation calculations and (if proposed) geotextile selection calculations if the geotextile could affect hydraulic loading rate.

5	**Biofiltration BMP must include operation and maintenance design features and planning considerations for continued effectiveness of pollutant removal and flow control functions. Biofiltration BMPs require regular maintenance in order provide ongoing function as intended. Additionally, it is not possible to foresee and avoid potential issues as part of design; therefore, plans must be in place to correct issues if they arise.**	
	Requirement	Response

5a	Is there any media or cartridge required to maintain the function of the BMP sole-sourced or proprietary in any way? If yes, obtain explicit approval by the Agency. Potentially full replacement costs to a non-proprietary BMP needs to be considered.	Yes _____ or No_____, explain:
5b	The maintenance plan specific for the proprietary BMP specific inspection activities, regular/periodic maintenance activities and specific corrective actions relating to scour, erosion, channeling, media clogging, vegetation health, and inflow and outflow structures.	This is in addition to the O&M Plan described in the WQMP guidance document, Section 5.
5c	Adequate site area and features have been provided for BMP inspection and maintenance access.	Illustrate maintenance access routes, setbacks, maintenance features as needed on project water quality plans
5d	For proprietary biofiltration BMPs, the BMP maintenance plan is consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies).	Yes _____ or No_____
5e	Describe all portions of the BMP that may potentially clog or present an O&M issue.	
5f	Describe design features to address each of the potential clogging or O&M issues.	

By signing below, the preparer certifies all the information provided with this submittal and submittals related to proprietary BMPs for the project is accurate, and relevant information to assess the long term operation and maintenance of this proprietary BMP was not omitted with this submittal.

Prepared by: _____

Title: _____

Signature: _____

Date: _____

Alternative Pollutant Treatment Performance Standard

County staff may allow the applicant to submit alternative third-party documentation that the pollutant treatment performance of the system is consistent with Technology Acceptance Protocol-Ecology certifications. Table F.1-1 describes the required levels of certification and Table F.1-2 describes the pollutant treatment performance levels associated with each level of certification. Acceptance of this approach is at the sole discretion of County staff, preference would be given to:

a. Verified third-party, field-scale testing performance under the Technology Acceptance Reciprocity Partnership Tier II Protocol. This protocol is no longer operated, however this is considered to be a valid protocol and historic verifications are considered to be representative provided that product models being proposed are consistent with those that were tested. Technology Acceptance Reciprocity Partnership verifications were conducted under New Jersey Corporation for Advance Testing and are archived at the website linked below. Note that Technology Acceptance Reciprocity Partnership verifications must be matched to pollutant treatment standards in Table F.1-2 then matched to an equivalent Technology Acceptance Protocol-Ecology certification in Table F.1-1.

b. Verified third-party, field-scale testing performance under the New Jersey Corporation for Advance Testing protocol. Note that New Jersey Corporation for Advance Testing verifications must be matched to pollutant treatment standards in Table F.1-2 then matched to an equivalent Technology Acceptance Protocol- Ecology certification in Table F.1-1. A list of field-scale verified technologies under Technology Acceptance Reciprocity Partnership Tier II and New Jersey Corporation for Advance Testing can be accessed at: http://www.njcat.org/verification-process/technology-verification-database.html (refer to: field verified technologies only).

Table F.1-1: Required Technology Acceptance Protocol-Ecology Certifications for Polltuants of Concern for Biofiltration Performance Standard

Project Pollutant of Concern	Required Technology Acceptance Protocol-Ecology Certification for Biofiltration Performance Standard
Trash	Basic Treatment OR Phosphorus Treatment OR Enhanced Treatment
Sediments	Basic Treatment OR Phosphorus Treatment OR Enhanced Treatment
Oil and Grease	Basic Treatment OR Phosphorus Treatment OR Enhanced Treatment
Nutrients	Phosphorus Treatment[1]
Metals	Enhanced Treatment
Pesticides	Basic Treatment (including filtration)[2] OR Phosphorus Treatment OR Enhanced Treatment
Organics	Basic Treatment (including filtration)[2] OR Phosphorus Treatment OR Enhanced Treatment
Bacteria and Viruses	Basic Treatment (including bacteria removal processes)[3] OR Phosphorus Treatment OR Enhanced Treatment

1 – There is no Technology Acceptance Protocol-Ecology equivalent for nitrogen compounds; however systems that are designed to retain phosphorus (as well as meet basic treatment designation), generally also provide treatment of nitrogen compounds. Where nitrogen is a pollutant of concern, relative performance of available certified systems for nitrogen removal should be considered in BMP selection.
2 – Pesticides, organics, and oxygen demanding substances are typically addressed by particle filtration consistent with the level of treatment required to achieve Basic treatment certification; if a system with Basic treatment certification does not provide filtration, it is not acceptable for pesticides, organics or oxygen demanding substances.
3 – There is no Technology Acceptance Protocol-Ecology equivalent for pathogens (viruses and bacteria), and testing data are limited because of typical sample hold times. Systems with Technology Acceptance Protocol-Ecology Basic Treatment must be include one or more significant bacteria removal process such as media filtration, physical sorption, predation, reduced redox conditions, and/or solar inactivation. Where design options are available to enhance pathogen removal (i.e., pathogen-specific media mix offered by vendor), this design variation should be used.

Table F.1-2: Performance Standards for Technology Acceptance Protocol-Ecology Certification

Performance Goal	Influent Range	Criteria
Basic Treatment	20 – 100 mg/L TSS	Effluent goal ≤ 20 mg/L TSS
	100 – 200 mg/L TSS	≥ 80% TSS removal
	>200 mg/L TSS	> 80% TSS removal
Enhanced (Dissolved Metals) Treatment	Dissolved copper 0.005 – 0.02 mg/L	Must meet basic treatment goal and better than basic treatment currently defined as >30% dissolved copper removal
	Dissolved zinc 0.02 – 0.3 mg/L	Must meet basic treatment goal and better than basic treatment currently defined as >60% dissolved zinc removal
Phosphorous Treatment	Total phosphorous 0.1 – 0.5 mg/L	Must meet basic treatment goal and exhibit ≥50% total phosphorous removal
Oil Treatment	Total petroleum hydrocarbon > 10 mg/L	No ongoing or recurring visible sheen in effluent Daily average effluent Total petroleum hydrocarbon concentration < 10 mg/L Maximum effluent Total petroleum hydrocarbon concentration for a 15 mg/L for a discrete (grab) sample
Pretreatment	50 – 100 mg/L TSS	≤ 50 mg/L TSS
	≥ 200 mg/L TSS	≥ 50% TSS removal

Appendix 6: LID BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation to supplement Section D

Examples of material to provide in Appendix 6 may include but are not limited to the following:

- DCV calculations,
- LID BMP sizing calculations from Exhibit C of the SMR WQMP
- Design details/drawings from manufacturers for proprietary BMPs

This information should support the Full Infiltration Applicability, and Biofiltration Applicability sections of this Template. Refer to Section 3.4 of the SMR WQMP and Sections D.4 of this Template.

Surface Type	Effective Impervious Fraction, I_f
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15

Riverside County – Santa Margarita Watershed - Low Impact Development BMP Design Handbook *rev. 6/2018*

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

RCFC & WCD
HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

PLATE D-5.6

BMP Design Volume, Vbmp, Drainage Area C (on-site)

Santa Margarita Watershed

BMP Design Volume, V_{BMP} (Rev. 03-2012)

Legend: Required Entries / Calculated Cells

(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)

Company Name	RTM CONSULTANTS	Date	9/1/2025
Designed by	JM	County/City Case No	
Company Project Number/Name	KELLER CROSSING 450.907		
Drainage Area Number/Name	AREA C - BASIN C		

Enter the Area Tributary to this Feature A_T = 86.5 acres

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

Site Location	Township	6S
	Range	2W
	Section	29
Enter the 85th Percentile, 24-hour Rainfall Depth	D_{85} =	0.57

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu)		Mixed Surface Types
Effective Impervious Fraction	I_f =	0.69

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ C = 0.48

Determine Design Storage Volume, V_{BMP}

Calculate V_U, the 85% Unit Storage Volume $V_U = D_{85} \times C$ V_u = 0.28 (in*ac)/ac

Calculate the design storage volume of the BMP, V_{BMP}.

$$V_{BMP}\ (ft^3) = \frac{V_U\ (in\text{-}ac/ac) \times A_T\ (ac) \times 43{,}560\ (ft^2/ac)}{12\ (in/ft)}$$

V_{BMP} = 87,919 ft^3

Extended Detention Basin, Drainage Area C BMP:

Santa Margarita Watershed BMP Design Volume, V_{BMP} (Rev. 03-2012)	Legend:	Required Entries Calculated Cells

(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)

Company Name	RTM CONSULTANTS	Date	9/1/2025
Designed by	JM	County/City Case No	
Company Project Number/Name	KELLER CROSSING 450.907		
Drainage Area Number/Name	AREA C - BASIN C		

Enter the Area Tributary to this Feature A_T = 5.3 acres

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

Site Location	Township	6S
	Range	2W
	Section	29
Enter the 85th Percentile, 24-hour Rainfall Depth	D_{85} =	0.57

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu)		Ornamental Landscaping
Effective Impervious Fraction	I_f =	0.10

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ C = 0.11

Determine Design Storage Volume, V_{BMP}

Calculate V_U, the 85% Unit Storage Volume $V_U = D_{85} \times C$ V_u = 0.06 (in*ac)/ac

Calculate the design storage volume of the BMP, V_{BMP}.

$$V_{BMP}\ (ft^3) = \frac{V_U\ (in\text{-}ac/ac) \times A_T\ (ac) \times 43{,}560\ (ft^2/ac)}{12\ (in/ft)}$$

V_{BMP} = 1,154 ft^3

Extended Detention Basin Design Procedure		BMP Subarea No.	Legend:	Required Entries / Calculated Cells
Company Name:	RTM CONSULTANTS			Date: 9.25.25
Designed by:	JM			County/City Case No.:

Design Volume

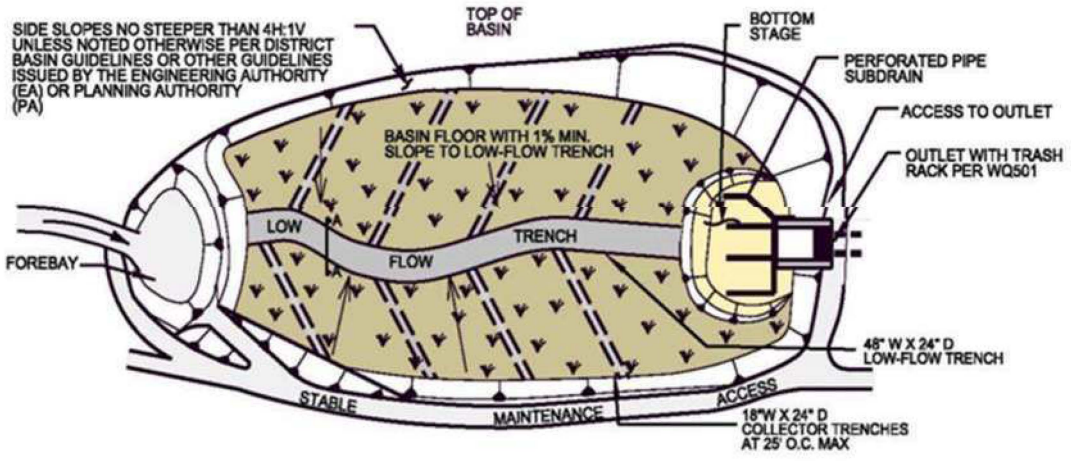
Tributary Area (BMP Subarea)	A_T =	91.8	acres
Enter V_{BMP}, determined from Section 2.1 of this Handbook	V_{BMP}=	89,073	ft^3

Basin Footprint

Overall Geometry

Length at Basin Bottom Surface	Length =	860	ft
Width at Basin Bottom Surface	Width =	135	ft
	Meets 1.5 : 1 requirement?	✓	
Side Slopes per "Basin Guidelines", Sect. 1.2	z =	4	:1
Proposed Basin Depth (with no freeboard)	D_B =	3.00	ft
Depth of freeboard (if used)	D_{FB} =	2.00	ft
Minimum Required Allowance for Total Depth (including proposed basin depth, freeboard, minimum depth of bottom stage (D_{BS}=0.33') and minimum filter depth (D_{FD}=2.33'))	D_{REQ} =	7.7	ft
Depth from design water surface elevation to lowest orifice	D_O =	3.0	ft

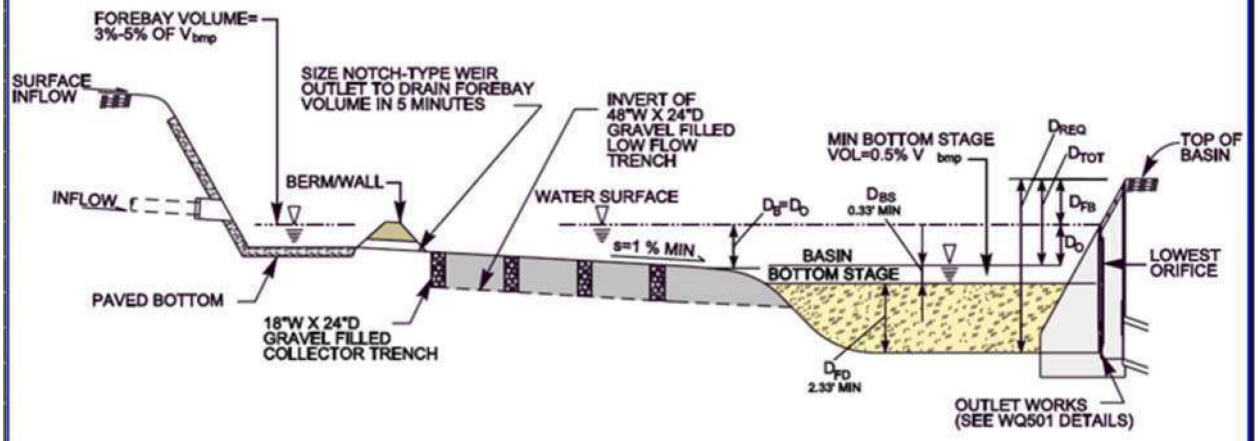
Page 1



Basin Design

Basin Design

Proposed Total Basin Depth (proposed depth plus freeboard)	D_{TOT} =	5.00	ft
Basin Invert Longitudinal Slope	Slope =	1.00	%
Basin Invert Transverse Slope (1% min)	Slope =	1	%
Basin Volume	V_{Basin} =	#####	ft^3



Forebay Design

Forebay Volume (3 - 5% V_{BMP})	V_{FB} =	3750	ft^3
Forebay Depth (height of berm)	D_{FBY} =	2	ft
Minimum Forebay Surface Area	A_{FB} =	1875	ft^2
Rectangular weir (notch)	W =	2.00	in

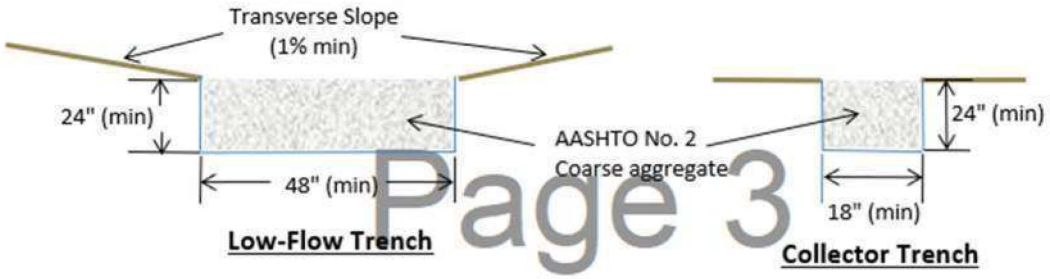
Dry Weather and Low-Flow Management

Low-Flow Trench (see graphic below)

Depth (24 inches minimum, gravel filled)	Depth = 24	inches
Width (48 inches minimum)	Width = 48	inches
Trench Invert Longitudinal Slope	Slope = 1	%

Collector Trenches (see graphic below)

Depth (24 inches minimum)	Depth = 24	inches
Width (18 inches minimum)	Width = 18	inches
Trench Invert Longitudinal Slope	Slope = 1	%
Spacing (25 feet on center maximum)	S = 25	feet



Page 3

Bottom Stage (Sand Filter) Design

Depth of the Bottom Stage (4" minimum ponding)	D_{BS} = 4	in
Surface Area of Bottom Stage	A_{BS} = 2087	ft^2
Dry Weather Ponded Volume (above sand layer)	V_{BS} = 696	ft^3

Is V_{BS} no less than 0.5% V_{BMP}? OK

Depth of ASTM-C33 sand (18 inch minimum)

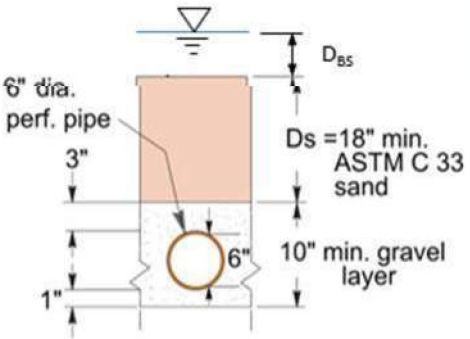
Ds = 18 inches

Diameter of Subdrains

ϕ = 6 in

Subdrain Spacing

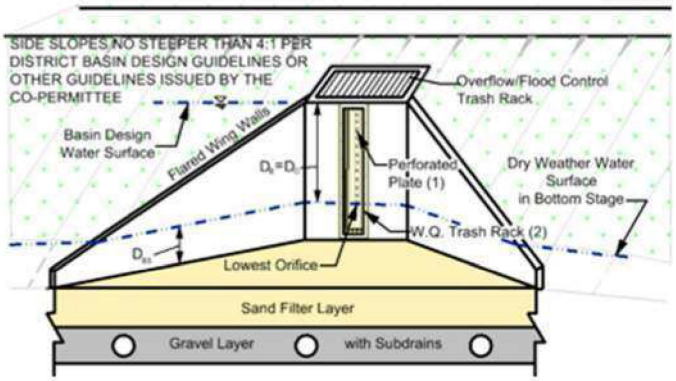
s = 10 ft. on center



Basin Outlet Design

Outlet Design

Assume an orifice area. Based on the information provided above, the spreadsheet provides discharge vs. stage data. Enter the volume vs. stage data for each interval. This information is used to route the volume through the basin. The size of the orifice is acceptable when the data shows that less than 50% of V_{BMP} has drained in 24 hours, and that 100% drawdown occurs within 72 hours.



Flow Rate, Q (cfs)

$$Q=CA[2g(H-H_o)]^{0.5}$$

Discharge Coefficient,

Default, C = 0.66

Other, C =

Orifice Area (ft^2)

Orifice Diameter, d; number of orifices per row, n; and number of orifice rows, N (from the bottom up).

d = 1.5 inches

n = 6 per row

N = 1 rows

Aeff = 0.074 ft^2 per row

or

Aeff = 10.598 in^2 per row

From outflow hydrograph, the time where 50% of V_{BMP} has drained from the basin (24 hour minimum):

Time (50%) = 32.41 hrs

OK

From outflow hydrograph, the time where 100% V_{BMP} has drained from the basin(within 72 hours):

Time (100 %) = 60.77 hrs

OK

Headwater Elev. / Stage (ft)	Discharge (cfs)	Volume (acre-ft)	Δt (hrs.)
0	0.0000	0.0000	
0.33	0.2249	0.027	2.90
0.67	0.3183	0.058	1.38
1.00	0.3898	0.087	0.99
1.33	0.4500	0.288	5.79
1.67	0.5033	0.577	7.34
2.00	0.5512	0.882	7.00
2.33	0.5954	1.304	8.91
2.67	0.6366	1.726	8.29
3.00	0.6751	2.711	18.17
3.33			
3.67			
4.00			
4.33			
4.67			
5.00			
5.33			
5.67			
6.00			
6.33			
6.67			
7.00			
7.33			
7.67			
8.00			
8.33			
8.67			
9.00			
9.33			
9.67			
10.00			
		∑ =	60.77

Page

BMP Design Volume, Vbmp, Drainage Area F

Santa Margarita Watershed BMP Design Volume, V_{BMP} (Rev. 03-2012)	Legend:	Required Entries Calculated Cells

(Note this worksheet shall **only** be used in conjunction with BMP designs from the LID BMP Design Handbook)

Company Name	RTM CONSULTANTS	Date	9/1/2025
Designed by	JM	County/City Case No	
Company Project Number/Name	KELLER CROSSING 450.907		
Drainage Area Number/Name	Area F - Basin E		

Enter the Area Tributary to this Feature — A_T = 16.4 acres

85th Percentile, 24-hour Rainfall Depth, from the Isohvetal Map in Handbook Appendix E

Site Location	Township	6S
	Range	2W
	Section	29
Enter the 85th Percentile, 24-hour Rainfall Depth	D_{85} =	0.57

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu)		Mixed Surface Types
Effective Impervious Fraction	I_f =	0.75

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ — C = 0.54

Determine Design Storage Volume, V_{BMP}

Calculate V_U, the 85% Unit Storage Volume $V_U = D_{85} \times C$ — V_u = 0.31 (in*ac)/ac

Calculate the design storage volume of the BMP, V_{BMP}.

$$V_{BMP}\ (ft^3) = \frac{V_U\ (in\text{-}ac/ac) \times A_T\ (ac) \times 43{,}560\ (ft^2/ac)}{12\ (in/ft)}$$

V_{BMP} = 18,455 ft^3

Notes:

BMP Design Flow Rate, Qbmp, Drainage Area F

Santa Margarita Watershed BMP Design Flow Rate, Q_{BMP} (Rev. 03-2012)		Legend:	Required Entries Calculated Cells
Company Name	K&A Engineering, Inc.	Date	4/26/2024
Designed by	JY	County/City Case No	
Company Project Number/Name	Keller Crossing		
Drainage Area Number/Name	Area F (on-site residential) = 16.4 Ac		
Enter the Area Tributary to this Feature	A_T = 16.4 acres		

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu)	Mixed Surface Types
Effective Impervious Fraction	I_f = 0.75

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ C = 0.54

BMP Design Flow Rate

$Q_{BMP} = C \times I \times A_T$ Q_{BMP} = 1.8 ft^3/s

Notes:

Bioretention Facility - Design Procedure	BMP ID: BASIN E	Legend:	Required Entries / Calculated Cells

Company Name: RTM CONSULTANTS — Date: 25-Sep 2025

Designed by: JM — County/City Case No.:

Design Volume

Enter the area tributary to this feature — A_T = 16.4 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook — V_{BMP} = 18,455 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer — d_S = 36.0 ft

Top Width of Bioretention Facility, excluding curb — w_T = 115.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ — d_E = 1.79 ft

Minimum Surface Area, A_m

$$A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$$

A_M = 10,288 ft^2

Proposed Surface Area — A= 14,500 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility — z = 4 :1

Diameter of Underdrain — 6 inches

Longitudinal Slope of Site (3% maximum) — 1 %

6" Check Dam Spacing — 25 feet

Describe Vegetation:

Notes:

HYDROMODIFICATION DRAINAGE AREA F (WQ Basin E)

It is expressly agreed and understood by the USER of this Excel Spreadsheet file (file) released hereby (whether released in digital or hard copy form) that Riverside County (County) makes no representation as to its accuracy. Further, it is the intent of the parties hereto that the USER shall review and verify calculations, analyze results, and/or independently determine the accuracy thereof prior to placing any reliance whatsoever on the information. Further, the USER shall hold the County, together with the officers, agents and employees of each, free and harmless from any liability whatsoever, including wrongful death, based or asserted upon any act or omission of the District or County, their officers, agents, employees or subcontractors, relating to or in any way connected with the unauthorized use of these files or information, and USER agrees to protect and defend, including all attorney fees and other expenses, each of the foregoing bodies and persons in any legal action based or asserted upon any such acts or omissions. USER also agrees not to sell, reproduce or release these files to others for any purpose whatsoever, except those incidental uses for which the files were acquired, verified and construed with USER'S own work product. Reasonable effort was made to fully comply with the San Diego MS4 Permit requirements using the methods found in the Riverside County Hydrology Manual. If the user finds an error in any way, please contact the County so that the error can be corrected. Any direct tampering of the equations in this spreadsheet would be considered extremely inappropriate, and potentially fraudulent.

Santa Margarita Region - County HydroMod Iterative Spreadsheet Model

Only for use the unincorporated portions of Riverside County, unless otherwise approved by the Co-Permittee

Development Project Number(s):	Keller Project	Rain Gauge	Wildomar/North Murrieta
Latitude (decimal format):	33.629736	BMP Type (per WQMP):	Residential - Area F = 16.4 Ac
Longitude (decimal format):	-117.096404	BMP Number (Sequential):	

Pre-Development - Hydrology Information

DRAINAGE AREA (ACRES) - 10 acre max	16.4	2-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.3	0.5
LONGEST WATERCOURSE (FT) - 1,000' max[1]	1752	10-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.1	0.788
UPSTREAM ELEVATION OF WATERCOURSE (FT)	1496	SLOPE OF THE INTENSITY DURATION - Plate D-4.6	0.55
DOWNSTREAM ELEV. OF WATERCOURSE (FT)	1449	CLOSEST IMPERVIOUS PERCENTAGE (%)	0% Undeveloped - Good Cover
EXISTING IMPERVIOUS PERCENTAGE (%)	0		
Use 10% of Q2 to avoid Field Screening requirements	Yes		

Pre-Development - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
32	16.4 Ac.	Pasture, Dryland	Poor Cover	0	20	30	50	72	86	94
								0	0	0
								0	0	0
	16.40 Ac.						Weighted Average RI Numbers =	72.0	86.0	94.0

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are: AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

Pre-Development - Calculated Range of Flow Rates analyzed for Hydromod (Suceptible Range of Flows)

Calculated Upper Flow-rate limit		Calculated Lower Flow-rate limit	
Ex. 10-year Flowrate[1] =	9.568 cfs	Ex. 10% of the 2-year Flowrate[1] =	0.704 cfs
(Co-Permitte Approval is required) User-Defined Discharge Values with accompanying Hydrology Study[1]			
Ex. 10-year Flowrate (Attach Study) =	cfs	Ex. 2-year Flowrate (Attach Study) =	cfs

[1]The equations used to determine the 10-year and 10% of the 2-yr are limited to 10-acres and 1,000'. Flowrates from a separate study can be used to over-ride the calculated values so that larger areas (up to 20 acres) and longer watercourse lengths can be used. All values still need to be filled out, even when there is a user-defined discharge value entered.

Post-Project - Hydrograph Information

DRAINAGE AREA (ACRES)	16.4	Go to "BMP Design" tab to design your BMP, then check results below. Print both this "HydroMod" Sheet and the "BMP Design" sheet for your submittal.
LONGEST WATERCOURSE (FT)	1752	
DIFFERENCE IN ELEV (FT) - along watercourse	47	
PROPOSED IMPERVIOUS PERCENTAGE (%)	75	

Post-Project - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
22	16.4 Ac.	Urban Landscaping	Good Cover		20	30	50	50	69	84
								0	0	0
								0	0	0
	16.40 Ac.						Weighted Average RI Numbers =	50.0	69.0	84.0

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are: AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

			First result out of compliance in the rainfall record				
Hydromod Ponded depth	2.20 feet						See below for the Height in the Basin (Stage) that is causing a non-compliant result
Hydromod Drain Time (unclogged)	84.68 hours	Requirement		Proposed			
Is the HydroMod BMP properly sized?	Yes, this is acceptable	---	---	---	---		
Mitigated Q < 110% of Pre-Dev. Q?	Yes, this is acceptable	---	---	---	---	Issue @ Stage =	---
Mitigated Duration < 110% of Pre-Dev?*	Yes, this is acceptable	---	---	---	---	Issue @ Stage =	---

Responsible-in-charge: _____ Date: _____

Signature: _____ Spreadsheet Developed by: Benjie Cho, P.E.

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BMP Design

Fill in blue shaded areas

BMP Geometry & Detention Calculations

0.1 feet, Stage Intervals

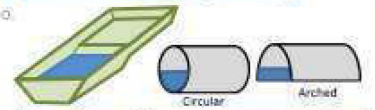
Increase intervals or decrease height

Height is above the limits of this sheet

PROPOSED BMP DIMENSIONS

STEP1: Size the BMP, so that the Total Volume > Max HydroMod Vol. (Deeper is ok, it will be refined in the Design Geometry)

Is the BMP a Tank shape? 2 1 for yes; 2 for no



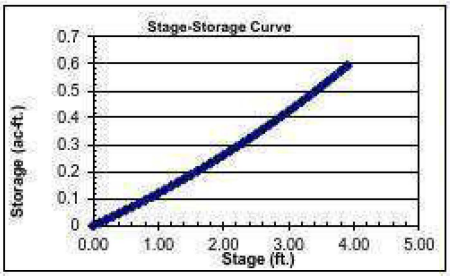
"Basin Shaped" "Tank Shaped"

Basin Shaped BMP (Bottom Stage 1st)

Bottom Stage H= 5.0' SS= 3 :1

	Top Area		Bottom Area	
Width	90	Width	60	FT
Length	110	Length	80	FT
area =	9900	area =	4800	

Top Stage H= 0.0'

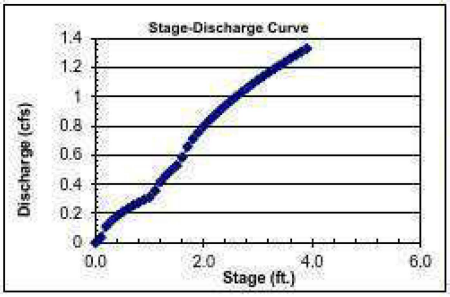


Prop. Top Stg. Vol. =	-	FT3
Prop Bottom Stg Vol =	35,989	FT3
Total Prop. Volume[1] =	35,989	FT3
Max HydroMod Volume =	12,670	FT3
Total Acreage[2] =	9,900	FT2
BMP % of Site =	1.39%	
Max HydroMod Depth[3] =	2.20	FT

[1]Does not include forebay, or low flow trench

[2]Does not account for freeboard or access roads

[3]Does not consider Increased Runoff



MINIMUM DESIGN GEOMETRY

STEP3: Delete outlets, then propose the largest lowest orifice that does not, exceed the ex. Q or Duration. If the Q is acceptable, but the duration is exceeded, try decreasing orifice, then adding a weir slightly below the stage that has an issue.

OUTLETS (for Stage-Discharge)

Orifice Outlets			Weir Outlets		
Invert Height (ft)	Diameter (inches)	No. of Orifices	Crest Height (ft)	Crest Width (ft)	No. of Weirs
0	2.00	3			
1	2.00	2			
1.5	2.00	2			

Hydromod Depth = 2.20 FT

+ 1' Freeboard = 3.20 FT

Top Surface Area

Based on HydroMod Depth +1' of Freeboard

Bottom Stage		
Width	90	FT
Length	110	FT

Stage-Storage-Discharge*

Stage (FT)	Storage (AC-FT)	Storage (FT3)	Q (CFS)
0	0	0	0
0.10	0.011	484	0.04
0.20	0.022	977	0.11
0.30	0.034	1478	0.15
0.40	0.046	1988	0.18
0.50	0.058	2506	0.21
0.60	0.070	3034	0.23
0.70	0.082	3570	0.26
0.80	0.094	4115	0.28
0.90	0.107	4669	0.29
1.00	0.120	5232	0.31
1.10	0.133	5804	0.36
1.20	0.147	6386	0.42
1.30	0.160	6976	0.46
1.40	0.174	7576	0.50
1.50	0.188	8185	0.53
1.60	0.202	8804	0.59
1.70	0.217	9433	0.66
1.80	0.231	10071	0.71
1.90	0.246	10719	0.76
2.00	0.261	11376	0.80
2.10	0.276	12043	0.84
2.20	0.292	12721	0.87
2.30	0.308	13408	0.91
2.40	0.324	14105	0.94
2.50	0.340	14812	0.97
2.60	0.357	15530	1.00
2.70	0.373	16258	1.03
2.80	0.390	16996	1.06
2.90	0.407	17745	1.09
3.00	0.425	18504	1.11
3.10	0.442	19274	1.14
3.20	0.460	20054	1.17
3.30	0.479	20845	1.19
3.40	0.497	21647	1.22
3.50	0.516	22459	1.24
3.60	0.535	23283	1.26
3.70	0.554	24118	1.29
3.80	0.573	24963	1.31
3.90	0.593	25820	1.33
	0.593	25,820	

STEP4: Complete an increased runoff analysis, if the project can impact downstream properties. Incorporate these designs into the WQMP site plan. Add emergency overflow weir, for flows that exceed the Hydromod volumes, sized to the 100-year peak flow rate. Add access roads (< 10% longitudinal slope) with enough width & turn around access for equipment that would be needed to scarify the bottom or remove Bioretention soil media.

Add Infiltration

Enter information from actual infiltration tests

Yes	Consider Infiltration (Yes or No)?		
0.06	Infiltration rate (in/hr) [3]	0.0067	ft3/sec, Infiltration (over entire bottom)
3	Factor of Safety (3 or greater) [3]	0.0022	ft3/sec, Infiltration / Factor of Safety
300	mins, Max. Time represented by tests		

[3]Per the RC LID Manual, Appendix A.

Only if allowed by the Co-Permittee, these infiltration inputs can be used to simulate Bioretention/Biofiltration rates with Backup Calcs and Data.

BMP Design Volume, Vbmp, Drainage Area G:

Santa Margarita Watershed BMP Design Volume, V_{BMP} (Rev. 03-2012)	Legend:	Required Entries Calculated Cells

(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)

Company Name	RTM CONSULTANTS	Date	9/1/2025
Designed by	JM	County/City Case No	
Company Project Number/Name	KELLER CROSSING 450.907		
Drainage Area Number/Name	Area G1 - Basin G		

Enter the Area Tributary to this Feature — A_T = 5.54 acres

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

Site Location	Township	6S
	Range	2W
	Section	29
Enter the 85th Percentile, 24-hour Rainfall Depth	D_{85} =	0.57

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu)	Mixed Surface Types	
Effective Impervious Fraction	I_f =	0.80

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ — C = 0.60

Determine Design Storage Volume, V_{BMP}

Calculate V_U, the 85% Unit Storage Volume $V_U = D_{85} \times C$ — V_u = 0.34 (in*ac)/ac

Calculate the design storage volume of the BMP, V_{BMP}.

$$V_{BMP}\ (ft^3) = \frac{V_U\ (in\text{-}ac/ac) \times A_T\ (ac) \times 43{,}560\ (ft^2/ac)}{12\ (in/ft)}$$

V_{BMP} = 6,837 ft^3

Notes:

Bioretention Facility - Design Procedure	BMP ID: BASIN G	Legend:	Required Entries / Calculated Cells

Company Name:	RTM CONSULTANTS	Date:	25-Sep 2025
Designed by:	JM	County/City Case No.:	

Design Volume

Enter the area tributary to this feature	A_T=	5.54	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	6,837	ft^3

Type of Bioretention Facility Design

- (●) Side slopes required (parallel to parking spaces or adjacent to walkways)
- ( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	36.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	75.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.79	ft
Minimum Surface Area, A_m $A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$	A_M =	3,819	ft^2
Proposed Surface Area	A=	11,745	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		1	%
6" Check Dam Spacing		25	feet
Describe Vegetation:			

Notes:

HYDROMODIFICATION DRAINAGE AREA G

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Santa Margarita Region - County HydroMod Iterative Spreadsheet Model

Only for use the unincorporated portions of Riverside County, unless otherwise approved by the Co-Permittee

Development Project Number(s):	Keller Project	Rain Gauge	Wildomar/North Murrieta
Latitude (decimal format):	33.629736	BMP Type (per WQMP):	Multifamily - Area G1 = 5.54 Ac
Longitude (decimal format):	-117.096404	BMP Number (Sequential):	

Pre-Development

Pre-Development - Hydrology Information			
DRAINAGE AREA (ACRES) - 10 acre max[1]	5.54	2-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.3	0.5
LONGEST WATERCOURSE (FT) - 1,000' max[1]	525	10-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.1	0.788
UPSTREAM ELEVATION OF WATERCOURSE (FT)	1501	SLOPE OF THE INTENSITY DURATION - Plate D-4.6	0.55
DOWNSTREAM ELEV. OF WATERCOURSE (FT)	1453	CLOSEST IMPERVIOUS PERCENTAGE (%)	0% Undeveloped - Good Cover
EXISTING IMPERVIOUS PERCENTAGE (%)	0		
Use 10% of Q2 to avoid Field Screening requirements	Yes		

Pre-Development

Pre-Development - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
32	5.54 Ac.	Pasture, Dryland	Poor Cover	0	20	30	50	72	86	94
								0	0	0
								0	0	0
	5.54 Ac.						Weighted Average RI Numbers =	72.0	86.0	94.0

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are:
AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

Pre-Development

Pre-Development - Calculated Range of Flow Rates analyzed for Hydromod (Suceptible Range of Flows)	
Calculated Upper Flow-rate limit	Calculated Lower Flow-rate limit
Ex. 10-year Flowrate[1] = 3.433 cfs	Ex. 10% of the 2-year Flowrate[1] = 0.387 cfs
(Co-Permitte Approval is required) User-Defined Discharge Values with accompanying Hydrology Study[1]	
Ex. 10-year Flowrate (Attach Study) = cfs	Ex. 2-year Flowrate (Attach Study) = cfs

[1]The equations used to determine the 10-year and 10% of the 2-yr are limited to 10-acres and 1,000'. Flowrates from a separate study can be used to over-ride the calculated values so that larger areas (up to 20 acres) and longer watercourse lengths can be used. All values still need to be filled out, even when there is a user-defined discharge value entered.

Post-Project

Post-Project - Hydrograph Information		
DRAINAGE AREA (ACRES)	5.54	Go to "BMP Design" tab to design your BMP, then check results below. Print both this "HydroMod" Sheet and the "BMP Design" sheet for your submittal.
LONGEST WATERCOURSE (FT)	525	
DIFFERENCE IN ELEV (FT) - along watercourse	12	
PROPOSED IMPERVIOUS PERCENTAGE (%)	80	

Post-Project

Post-Project - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
22	5.54 Ac.	Urban Landscaping	Good Cover		20	30	50	50	69	84
								0	0	0
								0	0	0
	5.54 Ac.						Weighted Average RI Numbers =	50.0	69.0	84.0

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are:
AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

Results

		First result out of compliance in the rainfall record				See below for the Height in the Basin (Stage) that is causing a non-compliant result	
Hydromod Ponded depth	1.30 feet	Requirement		Proposed			
Hydromod Drain Time (unclogged)	45.38 hours						
Is the HydroMod BMP properly sized?	Yes, this is acceptable	---	---	---	---		
Mitigated Q < 110% of Pre-Dev. Q?	Yes, this is acceptable	---	---	---	---	Issue @ Stage =	---
Mitigated Duration < 110% of Pre-Dev?*	Yes, this is acceptable	---	---	---	---	Issue @ Stage =	---

Responsible-in-charge: _____ Date: _____

Signature: _____ Spreadsheet Developed by: Benjie Cho, P.E.

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BMP Design

Fill in blue shaded areas

BMP Geometry & Detention Calculations

0.1 feet, Stage Intervals

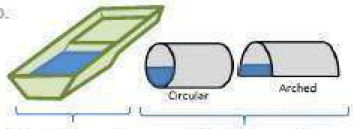
Increase intervals or decrease height

Height is above the limits of this sheet

PROPOSED BMP DIMENSIONS

STEP1: Size the BMP, so that the Total Volume > Max HydroMod Vol. (Deeper is ok, it will be refined in the Design Geometry)

Is the BMP a Tank shape? 2 1 for yes; 2 for no.



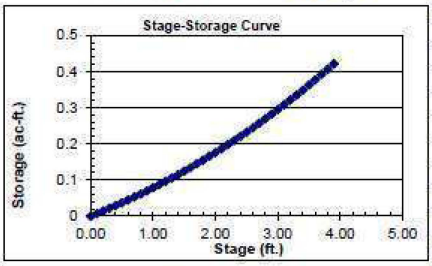
"Basin Shaped" "Tank Shaped"

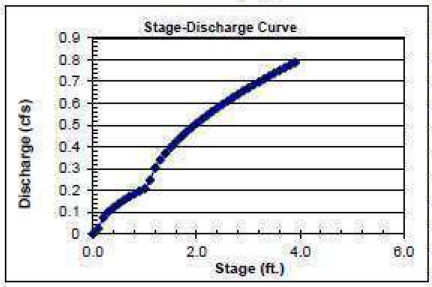
Basin Shaped BMP (Bottom Stage 1st)

Bottom Stage H= 5.0' SS= 3 :1

	Top Area		Bottom Area	
Width	60	Width	30	FT
Length	130	Length	100	FT
area =	7800	area =	3000	

Top Stage H= 0.0'





Prop. Top Stg. Vol. =	-	FT3
Prop Bottom Stg Vol =	26,062	FT3
Total Prop. Volume[1] =	26,062	FT3
Max HydroMod Volume =	4,422	FT3
Total Acreage[2] =	7,800	FT2
BMP % of Site =	3.23%	
Max HydroMod Depth[3] =	1.30	FT

[1]Does not include forebay, or low flow trench

[2]Does not account for freeboard or access roads

[3]Does not consider Increased Runoff

MINIMUM DESIGN GEOMETRY

STEP3: Delete outlets, then propose the largest lowest orifice that does not, exceed the ex. Q or Duration. If the Q is acceptable, but the duration is exceeded, try decreasing orifice, then adding a weir slightly below the stage that has an issue.

OUTLETS (for Stage-Discharge)

Orifice Outlets			Weir Outlets		
Invert Height (ft)	Diameter (inches)	No. of Orifices	Crest Height (ft)	Crest Width (ft)	No. of Weirs
0	2.00	2			
1	2.00	2			

Hydromod Depth = 1.30 FT

+ 1' Freeboard = 2.30 FT

Top Surface Area

Based on HydroMod Depth +1' of Freeboard

Bottom Stage		
Width	60	FT
Length	130	FT

Stage-Storage-Discharge*

Stage (FT)	Storage (AC-FT)	Storage (FT3)	Q (CFS)
0	0	0	0
0.10	0.007	304	0.02
0.20	0.014	616	0.07
0.30	0.021	935	0.10
0.40	0.029	1263	0.12
0.50	0.037	1599	0.14
0.60	0.045	1943	0.16
0.70	0.053	2295	0.17
0.80	0.061	2656	0.18
0.90	0.069	3025	0.20
1.00	0.078	3402	0.21
1.10	0.087	3788	0.25
1.20	0.096	4182	0.30
1.30	0.105	4585	0.34
1.40	0.115	4997	0.37
1.50	0.124	5418	0.40
1.60	0.134	5848	0.42
1.70	0.144	6286	0.45
1.80	0.155	6734	0.47
1.90	0.165	7190	0.49
2.00	0.176	7656	0.51
2.10	0.187	8131	0.53
2.20	0.198	8615	0.55
2.30	0.209	9109	0.56
2.40	0.221	9612	0.58
2.50	0.232	10125	0.60
2.60	0.244	10647	0.61
2.70	0.257	11179	0.63
2.80	0.269	11721	0.64
2.90	0.282	12273	0.66
3.00	0.295	12834	0.67
3.10	0.308	13405	0.69
3.20	0.321	13987	0.70
3.30	0.335	14578	0.71
3.40	0.348	15180	0.73
3.50	0.363	15792	0.74
3.60	0.377	16414	0.75
3.70	0.391	17047	0.76
3.80	0.406	17690	0.78
3.90	0.421	18344	0.79
	0.421	18.344	

STEP4: Complete an increased runoff analysis, if the project can impact downstream properties. Incorporate these designs into the WQMP site plan. Add emergency overflow weir, for flows that exceed the Hydromod volumes, sized to the 100-year peak flow rate. Add access roads (< 10% longitudinal slope) with enough width & turn around access for equipment that would be needed to scarify the bottom or remove Bioretention soil media.

Add Infiltration

Enter information from actual infiltration tests

Yes	Consider Infiltration (Yes or No)?		
0.1	Infiltration rate (in/hr) [3]	0.0069	ft3/sec, Infiltration (over entire bottom)
3	Factor of Safety (3 or greater) [3]	0.0023	ft3/sec, Infiltration / Factor of Safety
300	mins, Max. Time represented by tests		

[3]Per the RC LID Manual, Appendix A.

Only if allowed by the Co-Permittee, these infiltration inputs can be used to simulate Bioretention/Biofiltration rates with Backup Calcs and Data.

Appendix 7:
Hydromodification & Critical Coarse Sediment

Supporting Detail for Hydromodification compliance & Exhibit G - CCSY & PSS Areas with the project location.

The preparer shall include the following in this Appendix (Refer to Section 2.4 and 3.6 of the SMR WQMP and Sections E of this Template):

- Hydromodification Exemption Exhibit (if the project is in an area exempt from Hydromod)
- Potential Critical Coarse Sediment Yield Area Mapping (to show if the site is out of a CCSYA)
- Hydromodification BMP sizing calculations (i.e. County Hydromod Spreadsheet – Hydromod, and BMP Design tabs, SMRHM report files, or other acceptable Hydromod calculations)
- Site-Specific Critical Coarse Sediment Analysis (if a project impacts a CCSYA)
- Design details/drawings from manufacturers for proprietary BMPs (if proprietary BMPs are proposed)

In addition, the project shall comply with drainage law and good practices:

- Protect the Site and Roads from Q100yr, without impacting adjacent property owners.
- Pad elevations must be above the Q100yr water surface at all locations.

I. Identify Offsite Hydrology

A. If the project intends to allow the flows to pass through the project uninterrupted, the flows must remain along its natural flow-path and natural condition. The project must also:
   (1) Ensure that the existing stream is stable. If not, the design must include stabilization.
   (2) Does the 100 year flow path affect proposed project elements, such as streets and fill slopes? If so, the project must properly design for impingements, provide revetment, etc. If the water surface changes due to impingements on neighbor's properties, Permission to pond letters must be provided.

B. If the project intends to collect and convey the offsite flows, see the next section:

II. Hydraulics

A. Project must provide collection inlets that can be accessed for maintenance. If located outside of the project boundary, the project must provide a Permission Letter or drainage easement. If the inlet creates new ponding on private property, the project must provide a Permission to Pond letter or easement.

B. The project should not divert watershed areas over 1 acre. If so, Permission Letter to accept project's diversion and drainage concept must be received by the project.

C. The project should have an adequate outlet. If not, include Permission Letters and implement Increased Runoff criteria (2, 5,10 year storm events and the 1, 3, 6 and 24 hour durations). 100 year storm routing is not to be used. Runoff from the offsite plus onsite must be returned to its natural (existing) condition of velocity, peak flow-rate, flow-width and location/right of way, if permission letters have not been obtained.

D. The project must adequately convey the 100 year storm between the combination of street flow and pipe flow per County Ordinance.

E. The project should use the downstream connection as the Q100yr water surface control elevation, to ensure 6 inches minimum of freeboard in proposed drainage system.

III. Basin Layout

A. Implement Basin Guidelines as best as possible from Appendix C, Design Handbook for LID BMPs.

DETENTION BASIN ROUTING for HYDROMOD CALCULATIONS

The proposed project Water Quality Biofiltration Basin is capable of all of the following:

1. Releasing the post-development hydrograph for 2-, 5-, 10- and 100-year 1-, 3-, 6- and 24-hour at flow rates no greater than 110% of pre-development at the same frequency flow rates.

2. By-passing the 100-year storm event without damage to the BMP.
3. Control outlet velocities such that downstream erosion potential is minimized and outlet flow is released in a safe manner.

Unit Hydrograph Analysis

The unit hydrograph analysis was conducted using the CivilDesign Corporation Unit Hydrograph software and the Riverside County Hydrology Manual. In this study analysis, the goal was to estimate the quantity of storm water to be detained onsite to mitigate the increase in storm water peak discharge and volume resulting from this development. The 1-hour, 3-hour, 6-hour and 24-hour 100-year storms hydrographs were computed to evaluate the project peak runoff discharge originating from the site for ultimate/proposed conditions.

For sensitive analysis 1-hour, 3-hour, 6-hour and 24-hour 2-, 5-, 10- and 100-year storms hydrographs were computed and compared the basin outflows with the existing conditions. The ultimate condition-project hydrographs will be used as inflow hydrograph in detention basin routing with restricted outlet structure works.

The following rainfall data used to determine the $Q_{(100)}$ Off-Site storm values (Informational Data Only): the 100 year, 1-hour intensity used was 1.20 (In/Hr), the 2 year, 1-hour intensity used was 0.50 (In/Hr) and the Slope of the Intensity Duration Curve of 0.55. The primary land use was assumed to be undeveloped with poor cover while a runoff coefficient of 0.90 was used for the improved road surface areas.

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2000 Version 6.3
      Rational Hydrology Study        Date: 06/02/10  File:sr79a.out
--------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

--------------------------------------------------------------------------
Darrin Ginn, Murrieta, California - S/N   874
--------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [ Homeland-Winchester ] area used.
10 year storm 10 minute intensity =  2.030(In/Hr)
10 year storm 60 minute intensity =  0.800(In/Hr)
100 year storm 10 minute intensity =  3.050(In/Hr)
100 year storm 60 minute intensity =  1.200(In/Hr)
```

Per Caltrans Hydrology (existing conditions) information above, for Rational Method proposed conditions: Rainfall Intensity for 2-year 1-hour storm = 0.50 in/hr and for 100-year 1-hour storm = 1.20 in/hr.

For Inflow Hydrograph, the rainfall intensity per table below:
Summary of Precipitation – Intensity Pattern per Riverside County Hydrology Manual (NOAA Atlas 2), also to match Caltrans Hydrology Existing Condition:

Storm Event	***1-hour***	***3-hour***	***6-hour***	***24-hour***
2-year	0.5	0.77	0.95	1.55
100-year	1.2	1.77	2.45	4.05

Detention Basin Routing Calculations

The Detention Basin Routing Calculations were conducted using the CivilCADD/Design software and the Riverside County Hydrology Manual. In this analysis, the goal was to estimate the quantity of

storm water to be detained onsite to mitigate the increase in storm water peak discharge and volume resulting from this development for the 2-, 5-, 10-, 100-year 1-, 3-, 6-, 24-hour storms.

Summary of Hydrographs and Basin Routing: Drainage Area C onsite – Residential (91.8 Ac)

Storm Frequency	Existing Q_2 (cfs) [1]	Proposed Q_2 (cfs)	Det. Basin Outlet Q_2 (cfs) [2]	Different [2] – [1] (cfs)	Different [2] – [1] (%)
2-year 1-hour	52.867	92.574	1.869	-50.998	-96%
2-year 3-hour	20.803	42.196	1.952	-18.851	-90%
2-year 6-hour	11.663	31.285	2.006	-9.657	-82%
2-year 24-hour	2.288	12.607	2.586	0.298	13%

Storm Frequency	Existing Q_5 (cfs) [1]	Proposed Q_5 (cfs)	Det. Basin Outlet Q_5 (cfs) [2]	Different [2] – [1] (cfs)	Different [2] – [1] (%)
5-year 1-hour	95.272	127.286	1.964	-93.308	-98%
5-year 3-hour	52.153	59.399	2.311	-49.842	-95%
5-year 6-hour	42.002	47.069	2.847	-39.155	-93%
5-year 24-hour	8.470	17.370	7.898	-0.572	-6.7%

Storm Frequency	Existing Q_{10} (cfs) [1]	Proposed Q_{10} (cfs)	Det. Basin Outlet Q_{10} (cfs) [2]	Different [2] – [1] (cfs)	Different [2] – [1] (%)
10-year 1-hour	116.901	161.063	2.305	-114.596	-98%
10-year 3-hour	64.971	80.440	3.030	-61.941	-95%
10-year 6-hour	54.767	66.475	9.336	-45.431	-83%
10-year 24-hour	13.907	21.602	14.141	0.234	1.6%

Storm Frequency	Existing Q_{100} (cfs) [1]	Proposed Q_{100} (cfs)	Det. Basin Outlet Q_{100} (cfs) [2]	Different [2] – [1] (cfs)	Different [2] – [1] (%)
100-year 1-hour	199.139	257.785	17.640	-181.499	-91%
100-year 3-hour	118.610	132.718	44.934	-73.676	-62%
100-year 6-hour	108.226	116.935	70.119	-38.107	-35%
100-year 24-hour	41.620	45.160	36.434	-5.186	-12%

See **Attachments** for Inflow Hydrographs and Detention Basin Routing Calculations in the Drainage Report.

Summary of Hydrographs and Basin Routing:
Drainage Areas F = 59.0 Ac
Separate WQ Basin E use for Hydromodification (DMAs F-5 thru F-8) and Detention Basin F for Peak Flow reduction

WQ Basin E

Storm Frequency	DS #5 Culvert Capacity Q_{max} (cfs	DS #5 Culvert Capacity Q_{100} (cfs)	Proposed Q_{INFLOW} (cfs)	Det. Basin Outlet $Q_{OUTFLOW}$ (cfs)
10-year 1-hour	14.0	106.6	Hydromodification - Q_{max} = 9.7 cfs	
25-year 1-hour	14.0	106.6		
Qbmp Area F = 1.8 cfs				

Detention Basin F

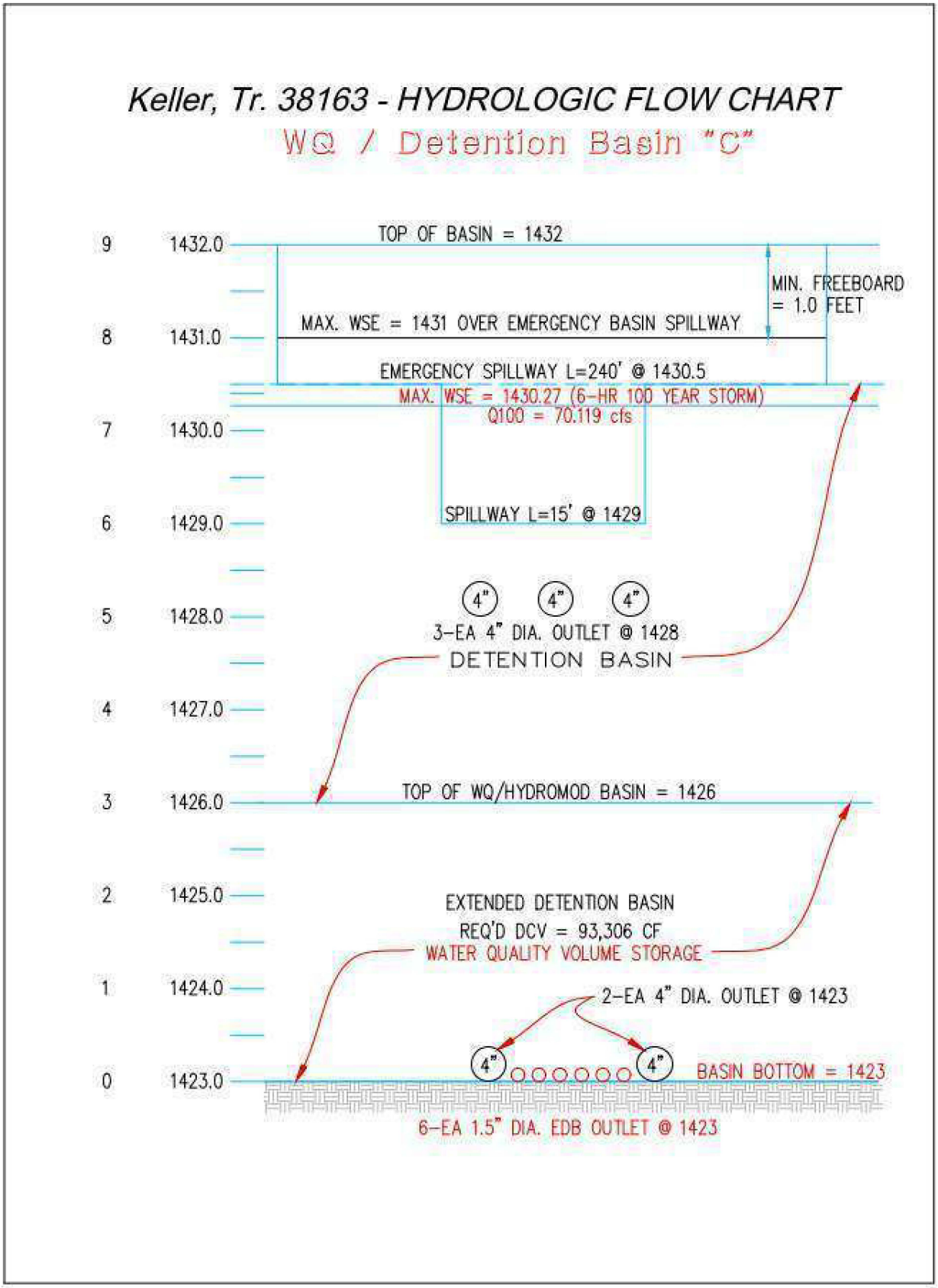
Storm Frequency	DS #6 Culvert Capacity Q_{max} (cfs	DS #6 Culvert Capacity Q_{100} (cfs)	Proposed Q_{INFLOW} (cfs)	Det. Basin Outlet $Q_{OUTFLOW}$ (cfs)
100-year 1-hour	18.7	31.6	124.839	12.798
100-year 3-hour	18.7	31.6	75.768	13.388
100-year 6-hour	18.7	31.6	69.295	**13.715**
100-year 24-hour	18.7	31.6	26.887	12.703

Summary of Hydrographs and Basin Routing:
Drainage Area G = 5.5 Ac
WQ / Detention G use for Hydromodification and Peak Flow reduction

Detention Basin G

Storm Frequency	DS #7 Culvert Capacity Q_{max} (cfs	DS #7 Culvert Capacity Q_{100} (cfs)	Proposed Q_{INFLOW} (cfs)	Det. Basin Outlet $Q_{OUTFLOW}$ (cfs)
100-year 1-hour	19.5	16.32	20.520	5.381
100-year 3-hour	19.5	16.32	9.102	4.943
100-year 6-hour	19.5	16.32	9.440	4.885
100-year 24-hour	19.5	16.32	2.828	2.618

HYDROMODIFICATION DRAINAGE AREA C (ONSITE)



EXTENDED / DETENTION BASIN Drainage Area C:

Extended Detention Basin Design Procedure		BMP Subarea No. Area C	Legend:	Required Entries / Calculated Cells
Company Name:	K&A Engineering			Date: 4/2/2024
Designed by:	JY			County/City Case No.:

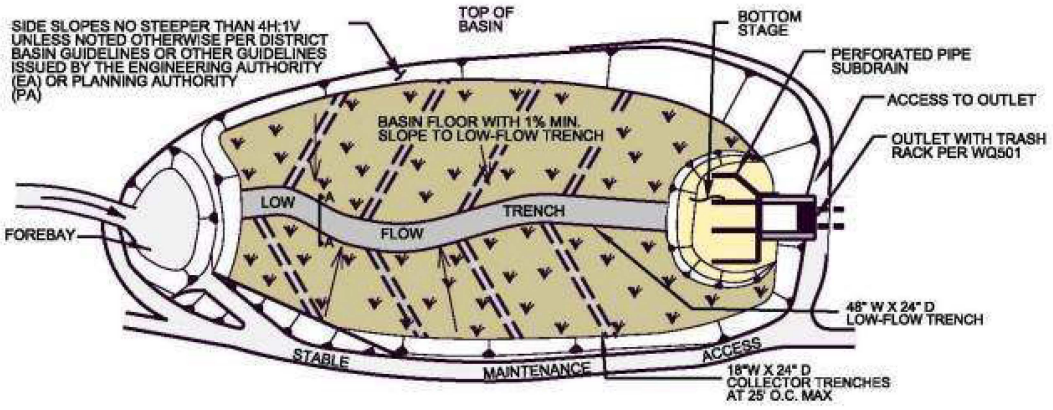
Design Volume

Tributary Area (BMP Subarea)	A_T =	91.8	acres
Enter V_{BMP}, determined from Section 2.1 of this Handbook	V_{BMP}=	93,306	ft^3

Basin Footprint

Overall Geometry

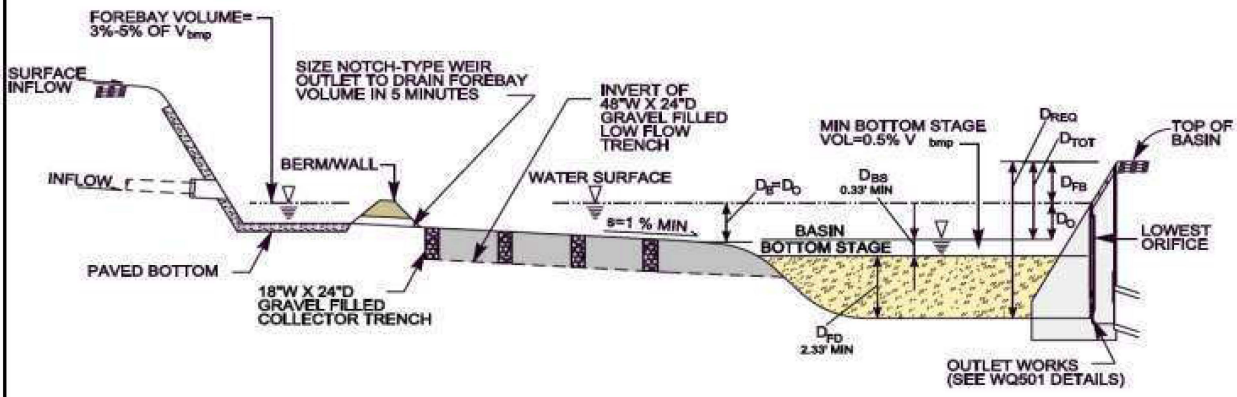
Length at Basin Bottom Surface	Length =	860	ft
Width at Basin Bottom Surface	Width =	135	ft
	Meets 1.5 : 1 requirement?	✓	
Side Slopes per "Basin Guidelines", Sect. 1.2	z =	4	:1
Proposed Basin Depth (with no freeboard)	D_B =	3.00	ft
Depth of freeboard (if used)	D_{FB} =	2.00	ft
Minimum Required Allowance for Total Depth (including proposed basin depth, freeboard, minimum depth of bottom stage (D_{BS}=0.33') and minimum filter depth (D_{FD}=2.33'))	D_{REQ} =	7.7	ft
Depth from design water surface elevation to lowest orifice	D_O =	3.0	ft



Basin Design

Basin Design

Proposed Total Basin Depth (proposed depth plus freeboard)	D_{TOT} =	5.00	ft
Basin Invert Longitudinal Slope	Slope =	1.00	%
Basin Invert Transverse Slope (1% min)	Slope =	1	%
Basin Volume	V_{Basin} =	51153	ft^3



Forebay Design

Forebay Volume (3 - 5% V_{BMP})	V_{FB} =	3750	ft^3
Forebay Depth (height of berm)	D_{FBY} =	2	ft
Minimum Forebay Surface Area	A_{FB} =	1875	ft^2
Rectangular weir (notch)	W =	2.00	in

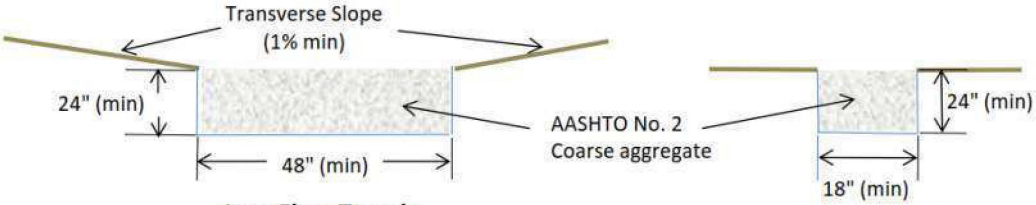
Dry Weather and Low-Flow Management

Low-Flow Trench (see graphic below)

Depth (24 inches minimum, gravel filled)	Depth = 24	inches
Width (48 inches minimum)	Width = 48	inches
Trench Invert Longitudinal Slope	Slope = 1	%

Collector Trenches (see graphic below)

Depth (24 inches minimum)	Depth = 24	inches
Width (18 inches minimum)	Width = 18	inches
Trench Invert Longitudinal Slope	Slope = 1	%
Spacing (25 feet on center maximum)	S = 25	feet



Low-Flow Trench | Collector Trench

Bottom Stage (Sand Filter) Design

Depth of the Bottom Stage (4" minimum ponding)	D_{BS} = 4	in
Surface Area of Bottom Stage	A_{BS} = 2087	ft^2
Dry Weather Ponded Volume (above sand layer)	V_{BS} = 696	ft^3

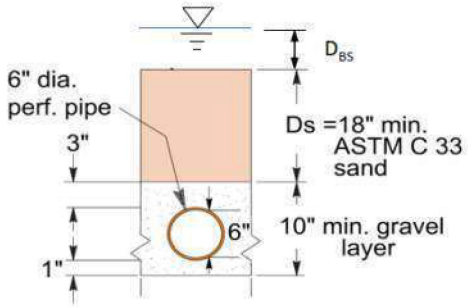
Is V_{BS} no less than 0.5% V_{BMP}? OK

Depth of ASTM-C33 sand (18 inch minimum)

Ds = 18 inches

Diameter of Subdrains: ϕ = 6 in

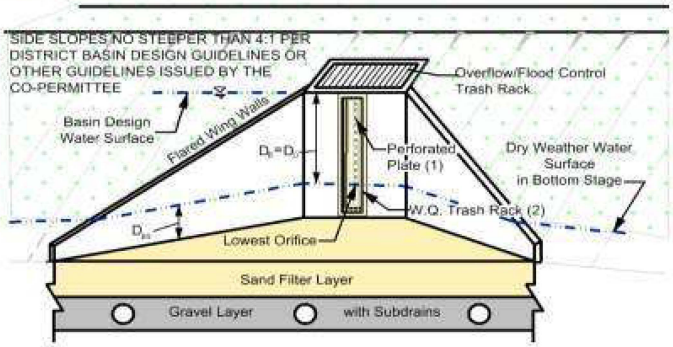
Subdrain Spacing: s = 10 ft. on center



Basin Outlet Design

Outlet Design

Assume an orifice area. Based on the information provided above, the spreadsheet provides discharge vs. stage data. Enter the volume vs. stage data for each interval. This information is used to route the volume through the basin. The size of the orifice is acceptable when the data shows that less than 50% of V_{BMP} has drained in 24 hours, and that 100% drawdown occurs within 72 hours.



Flow Rate, Q (cfs)

$$Q=CA[2g(H-H_o)]^{0.5}$$

Discharge Coefficient,

Default, C = 0.66

Other, C =

Orifice Area (ft^2)

Orifice Diameter, d; number of orifices per row, n; and number of orifice rows, N (from the bottom up).

d = 1.5 inches

n = 6 per row

N = 1 rows

Aeff = 0.074 ft^2 per row

or

Aeff = 10.598 in^2 per row

From outflow hydrograph, the time where 50% of V_{BMP} has drained from the basin (24 hour minimum):

Time (50%) = 31.38 hrs

OK

From outflow hydrograph, the time where 100% V_{BMP} has drained from the basin(within 72 hours):

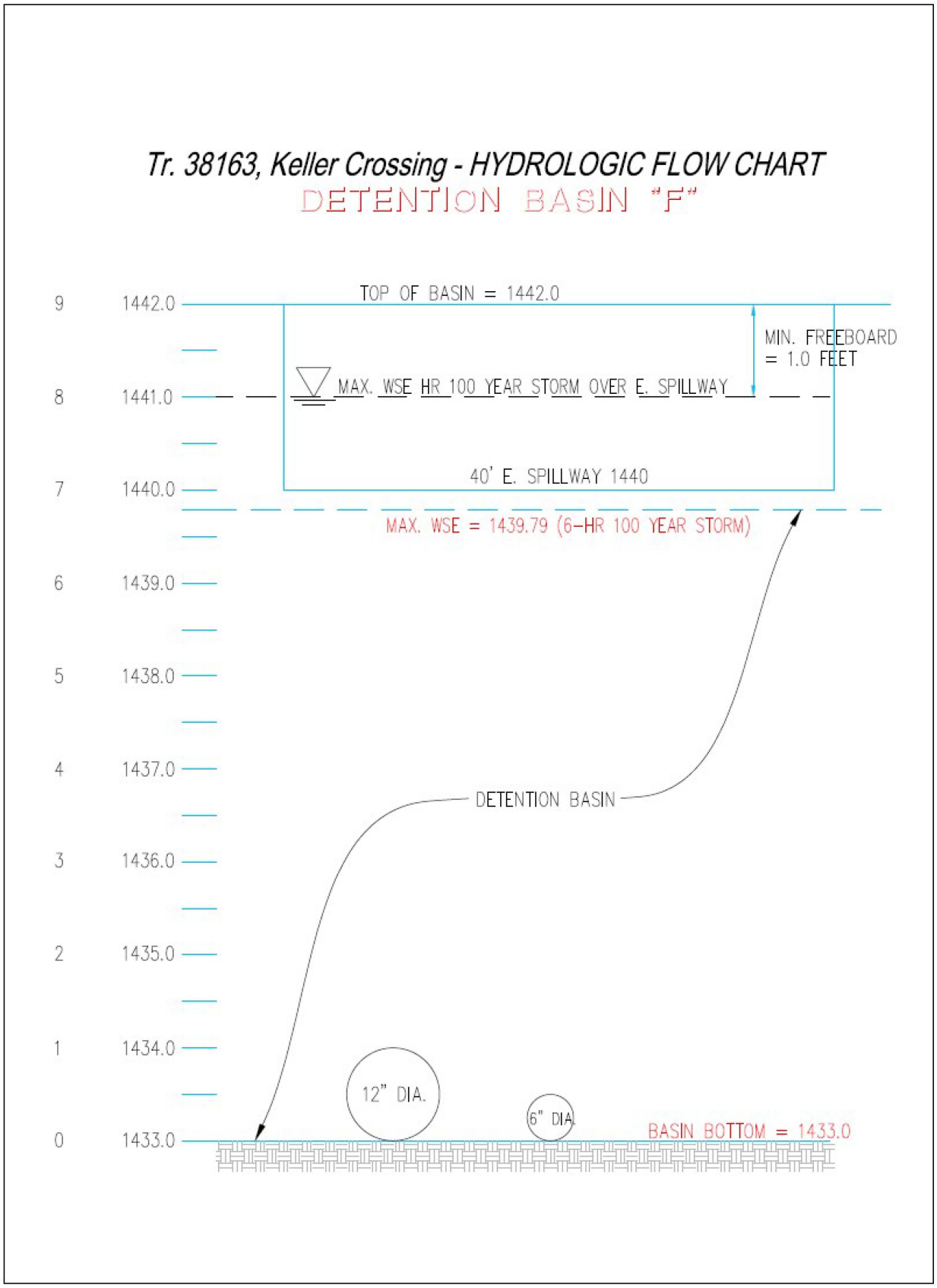
Time (100 %) = 60.77 hrs

OK

Headwater Elev. / Stage (ft)	Discharge (cfs)	Volume (acre-ft)	Δt (hrs.)
0	0.0000	0.0000	
0.33	0.2249	0.027	2.90
0.67	0.3183	0.058	1.38
1.00	0.3898	0.087	0.99
1.33	0.4500	0.288	5.79
1.67	0.5033	0.577	7.34
2.00	0.5512	0.882	7.00
2.33	0.5954	1.304	8.91
2.67	0.6366	1.726	8.29
3.00	0.6751	2.711	18.17
3.33			
3.67			
4.00			
4.33			
4.67			
5.00			
5.33			
5.67			
6.00			
6.33			
6.67			
7.00			
7.33			
7.67			
8.00			
8.33			
8.67			
9.00			
9.33			
9.67			
10.00			
		∑ =	60.77

Notes:

HYDROMODIFICATION DRAINAGE AREA F, WQ BASIN E AND DETENTION BASIN F



HYDROMODIFICATION DRAINAGE AREA F (WQ BASIN E)

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Santa Margarita Region - County HydroMod Iterative Spreadsheet Model

Only for use the unincorporated portions of Riverside County, unless otherwise approved by the Co-Permittee

Development Project Number(s):	Keller Project	Rain Gauge	Wildomar/North Murrieta
Latitude (decimal format):	33.629736	BMP Type (per WQMP):	Residential - Area F = 16.4 Ac
Longitude (decimal format):	-117.096404	BMP Number (Sequential):	

Pre-Development - Hydrology Information

DRAINAGE AREA (ACRES) - 10 acre max[1]	16.4	2-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.3	0.5
LONGEST WATERCOURSE (FT) - 1,000' max[1]	1752	10-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.1	0.788
UPSTREAM ELEVATION OF WATERCOURSE (FT)	1496	SLOPE OF THE INTENSITY DURATION - Plate D-4.6	0.55
DOWNSTREAM ELEV. OF WATERCOURSE (FT)	1449	CLOSEST IMPERVIOUS PERCENTAGE (%)	0% Undeveloped - Good Cover
EXISTING IMPERVIOUS PERCENTAGE (%)	0		
Use 10% of Q2 to avoid Field Screening requirements	Yes		

Pre-Development - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
32	16.4 Ac.	Pasture, Dryland	Poor Cover	0	20	30	50	72	**86**	94
								0	**0**	0
								0	**0**	0
	16.40 Ac.						**Weighted Average RI Numbers =**	**72.0**	**86.0**	**94.0**

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are: AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

Pre-Development - Calculated Range of Flow Rates analyzed for Hydromod (Suceptible Range of Flows)

Calculated Upper Flow-rate limit		Calculated Lower Flow-rate limit	
Ex. 10-year Flowrate[1] =	**9.568** cfs	Ex. 10% of the 2-year Flowrate[1] =	**0.704** cfs
(Co-Permitte Approval is required) User-Defined Discharge Values with accompanying Hydrology Study[1]			
Ex. 10-year Flowrate (Attach Study) =	cfs	Ex. 2-year Flowrate (Attach Study) =	cfs

[1]The equations used to determine the 10-year and 10% of the 2-yr are limited to 10-acres and 1,000'. Flowrates from a separate study can be used to over-ride the calculated values so that larger areas (up to 20 acres) and longer watercourse lengths can be used. All values still need to be filled out, even when there is a user-defined discharge value entered.

Post-Project - Hydrograph Information

DRAINAGE AREA (ACRES)	16.4	Go to "BMP Design" tab to design your BMP, then check results below. Print both this "HydroMod" Sheet and the "BMP Design" sheet for your submittal.
LONGEST WATERCOURSE (FT)	1752	
DIFFERENCE IN ELEV (FT) - along watercourse	47	
PROPOSED IMPERVIOUS PERCENTAGE (%)	75	

Post-Project - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
22	16.4 Ac.	Urban Landscaping	Good Cover		20	30	50	50	**69**	84
								0	**0**	0
								0	**0**	0
	16.40 Ac.						**Weighted Average RI Numbers =**	**50.0**	**69.0**	**84.0**

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are: AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

			First result out of compliance in the rainfall record				See below for the Height in the Basin (Stage) that is causing a non-compliant result	
			Requirement		Proposed			
Hydromod Ponded depth	**2.20 feet**							
Hydromod Drain Time (unclogged)	**84.68 hours**							
Is the HydroMod BMP properly sized?	**Yes, this is acceptable**		---	---	---	---		
Mitigated Q < 110% of Pre-Dev. Q?	**Yes, this is acceptable**		---	---	---	---	Issue @ Stage =	---
Mitigated Duration < 110% of Pre-Dev?*	**Yes, this is acceptable**		---	---	---	---	Issue @ Stage =	---

Responsible-in-charge: _____ Date: _____

Signature: _____ Spreadsheet Developed by: Benjie Cho, P.E.

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BMP Design

Fill in blue shaded areas

BMP Geometry & Detention Calculations

0.1	feet, Stage Intervals

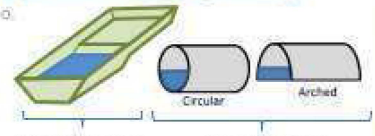
Increase intervals or decrease height

Height is above the limits of this sheet

PROPOSED BMP DIMENSIONS

STEP1: Size the BMP, so that the Total Volume > Max HydroMod Vol. (Deeper is ok, it will be refined in the Design Geometry)

Is the BMP a Tank shape? 2 1 for yes; 2 for no

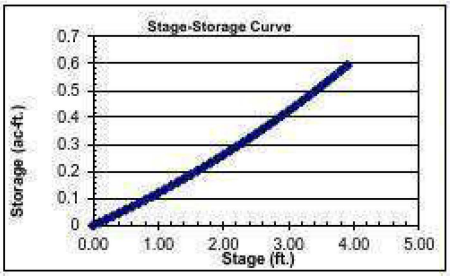


Basin Shaped BMP (Bottom Stage 1st)

Bottom Stage H= 5.0' SS= 3 :1

	Top Area		Bottom Area	
Width	90	Width	60	FT
Length	110	Length	80	FT
area =	9900	area =	4800	

Top Stage H= 0.0'

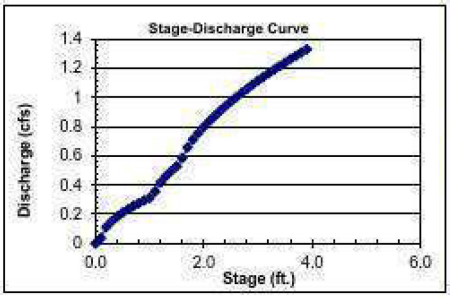


Prop. Top Stg. Vol. =	-	FT3
Prop Bottom Stg Vol =	35,989	FT3
Total Prop. Volume[1] =	35,989	FT3
Max HydroMod Volume =	12,670	FT3
Total Acreage[2] =	9,900	FT2
BMP % of Site =	1.39%	
Max HydroMod Depth[3] =	2.20	FT

[1]Does not include forebay, or low flow trench

[2]Does not account for freeboard or access roads

[3]Does not consider Increased Runoff



MINIMUM DESIGN GEOMETRY

STEP3: Delete outlets, then propose the largest lowest orifice that does not, exceed the ex. Q or Duration. If the Q is acceptable, but the duration is exceeded, try decreasing orifice, then adding a weir slightly below the stage that has an issue.

OUTLETS (for Stage-Discharge)

Orifice Outlets			Weir Outlets		
Invert Height (ft)	Diameter (inches)	No. of Orifices	Crest Height (ft)	Crest Width (ft)	No. of Weirs
0	2.00	3			
1	2.00	2			
1.5	2.00	2			

Hydromod Depth = 2.20 FT

+ 1' Freeboard = 3.20 FT

Top Surface Area

Based on HydroMod Depth +1' of Freeboard

Bottom Stage		
Width	90	FT
Length	110	FT

Stage-Storage-Discharge*

Stage (FT)	Storage (AC-FT)	Storage (FT3)	Q (CFS)
0	0	0	0
0.10	0.011	484	0.04
0.20	0.022	977	0.11
0.30	0.034	1478	0.15
0.40	0.046	1988	0.18
0.50	0.058	2506	0.21
0.60	0.070	3034	0.23
0.70	0.082	3570	0.26
0.80	0.094	4115	0.28
0.90	0.107	4669	0.29
1.00	0.120	5232	0.31
1.10	0.133	5804	0.36
1.20	0.147	6386	0.42
1.30	0.160	6976	0.46
1.40	0.174	7576	0.50
1.50	0.188	8185	0.53
1.60	0.202	8804	0.59
1.70	0.217	9433	0.66
1.80	0.231	10071	0.71
1.90	0.246	10719	0.76
2.00	0.261	11376	0.80
2.10	0.276	12043	0.84
2.20	0.292	12721	0.87
2.30	0.308	13408	0.91
2.40	0.324	14105	0.94
2.50	0.340	14812	0.97
2.60	0.357	15530	1.00
2.70	0.373	16258	1.03
2.80	0.390	16996	1.06
2.90	0.407	17745	1.09
3.00	0.425	18504	1.11
3.10	0.442	19274	1.14
3.20	0.460	20054	1.17
3.30	0.479	20845	1.19
3.40	0.497	21647	1.22
3.50	0.516	22459	1.24
3.60	0.535	23283	1.26
3.70	0.554	24118	1.29
3.80	0.573	24963	1.31
3.90	0.593	25820	1.33
	0.593	25,820	

STEP4: Complete an increased runoff analysis, if the project can impact downstream properties. Incorporate these designs into the WQMP site plan. Add emergency overflow weir, for flows that exceed the Hydromod volumes, sized to the 100-year peak flow rate. Add access roads (< 10% longitudinal slope) with enough width & turn around access for equipment that would be needed to scarify the bottom or remove Bioretention soil media.

Add Infiltration

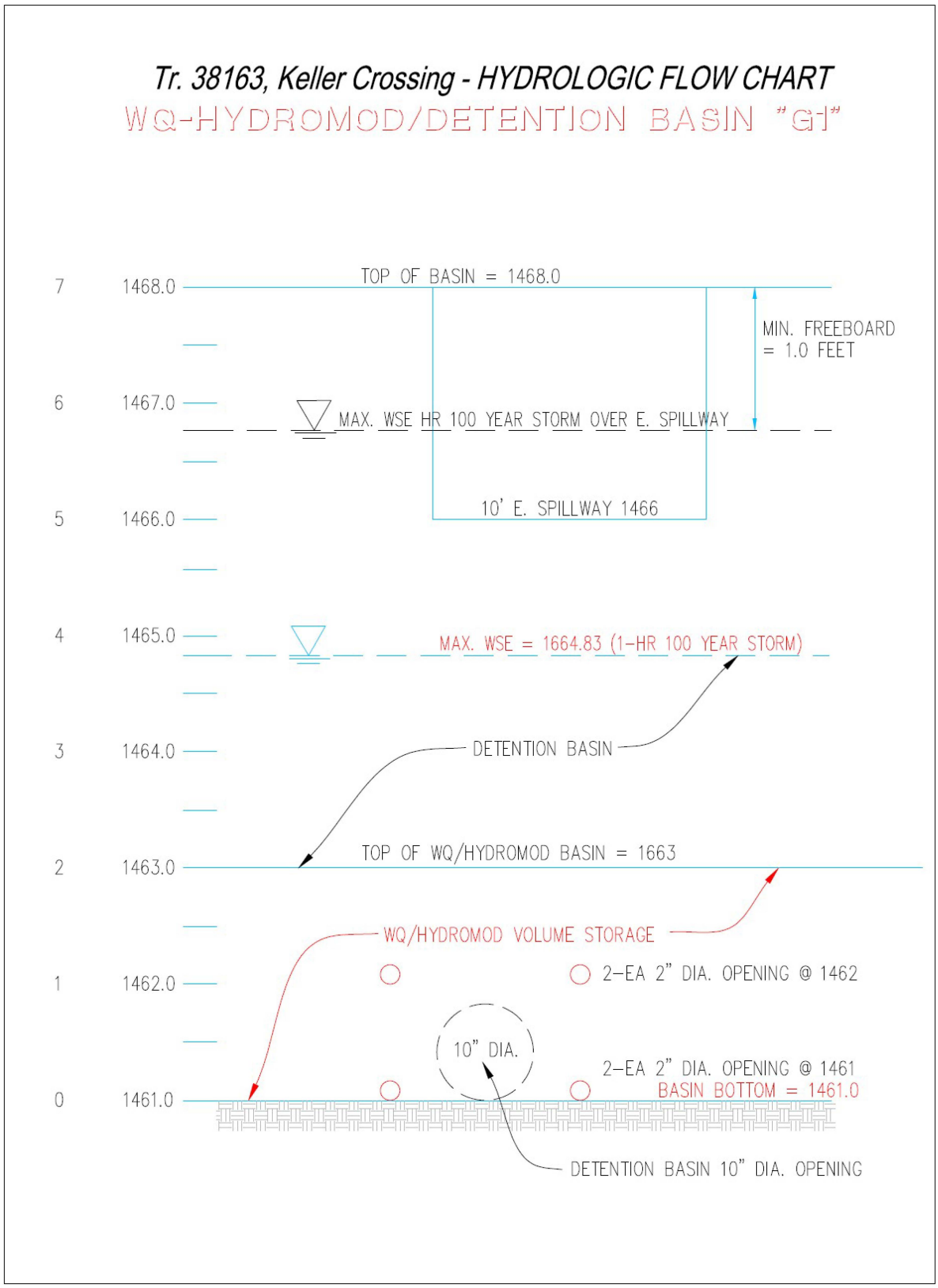
Enter information from actual infiltration tests

Yes	Consider Infiltration (Yes or No)?	
0.06	Infiltration rate (in/hr) [3]	0.0067 ft3/sec, Infiltration (over entire bottom)
3	Factor of Safety (3 or greater) [3]	0.0022 ft3/sec, Infiltration / Factor of Safety
300	mins, Max. Time represented by tests	

[3]Per the RC LID Manual, Appendix A.

Only if allowed by the Co-Permittee, these infiltration inputs can be used to simulate Bioretention/Biofiltration rates with Backup Calcs and Data.

HYDROMODIFICATION DRAINAGE AREA G, WQ / DETENTION BASIN G



HYDROMODIFICATION DRAINAGE AREA G

It is expressly agreed and understood by the USER of this Excel Spreadsheet file (file) released hereby (whether released in digital or hard copy form) that Riverside County (County) makes no representation as to its accuracy. Further, it is the intent of the parties hereto that the USER shall review and verify calculations, analyze results, and/or independently determine the accuracy thereof prior to placing any reliance whatsoever on the information. Further, the USER shall hold the County, together with the officers, agents and employees of each, free and harmless from any liability whatsoever, including wrongful death, based or asserted upon any act or omission of the District or County, their officers, agents, employees or subcontractors, relating to or in any way connected with the unauthorized use of these files or information, and USER agrees to protect and defend, including all attorney fees and other expenses, each of the foregoing bodies and persons in any legal action based or asserted upon any such acts or omissions. USER also agrees not to sell, reproduce or release these files to others for any purpose whatsoever, except those incidental uses for which the files were acquired, verified and combined with USER'S own work product. Reasonable effort was made to fully comply with the San Diego MS4 Permit requirements using the methods found in the Riverside County Hydrology Manual. If the user finds an error in any way, please contact the County so that the error can be corrected. Any direct tampering of the equations in this spreadsheet would be considered extremely inappropriate, and potentially fraudulent.

Santa Margarita Region - County HydroMod Iterative Spreadsheet Model

Only for use the unincorporated portions of Riverside County, unless otherwise approved by the Co-Permittee

Development Project Number(s):	Keller Project	Rain Gauge	Wildomar/North Murrieta
Latitude (decimal format):	33.629736	BMP Type (per WQMP):	Multifamily - Area G1 = 5.54 Ac
Longitude (decimal format):	-117.096404	BMP Number (Sequential):	

Pre-Development - Hydrology Information

DRAINAGE AREA (ACRES) - 10 acre max[1]	5.54	2-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.3	0.5
LONGEST WATERCOURSE (FT) - 1,000' max[1]	525	10-YEAR, 1-HOUR INTENSITY (IN/HR) - Plate D-4.1	0.788
UPSTREAM ELEVATION OF WATERCOURSE (FT)	1501	SLOPE OF THE INTENSITY DURATION - Plate D-4.6	0.55
DOWNSTREAM ELEV. OF WATERCOURSE (FT)	1453	CLOSEST IMPERVIOUS PERCENTAGE (%)	0% Undeveloped - Good Cover
EXISTING IMPERVIOUS PERCENTAGE (%)	0		
Use 10% of Q2 to avoid Field Screening requirements	Yes		

Pre-Development - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
32	5.54 Ac.	Pasture, Dryland	Poor Cover	0	20	30	50	72	86	94
								0	0	0
								0	0	0
	5.54 Ac.						Weighted Average RI Numbers =	72.0	86.0	94.0

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are: AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

Pre-Development - Calculated Range of Flow Rates analyzed for Hydromod (Suceptible Range of Flows)

Calculated Upper Flow-rate limit	Calculated Lower Flow-rate limit
Ex. 10-year Flowrate[1] = 3.433 cfs	Ex. 10% of the 2-year Flowrate[1] = 0.387 cfs
(Co-Permitte Approval is required) User-Defined Discharge Values with accompanying Hydrology Study[1]	
Ex. 10-year Flowrate (Attach Study) = cfs	Ex. 2-year Flowrate (Attach Study) = cfs

[1]The equations used to determine the 10-year and 10% of the 2-yr are limited to 10-acres and 1,000'. Flowrates from a separate study can be used to over-ride the calculated values so that larger areas (up to 20 acres) and longer watercourse lengths can be used. All values still need to be filled out, even when there is a user-defined discharge value entered.

Post-Project - Hydrograph Information

DRAINAGE AREA (ACRES)	5.54	Go to "BMP Design" tab to design your BMP, then check results below. Print both this "HydroMod" Sheet and the "BMP Design" sheet for your submittal.
LONGEST WATERCOURSE (FT)	525	
DIFFERENCE IN ELEV (FT) - along watercourse	12	
PROPOSED IMPERVIOUS PERCENTAGE (%)	80	

Post-Project - Soils Information

Cover Type #	Subarea Acreage	Cover Type	Vegetative Cover	Soil A %	Soil B %	Soil C %	Soil D %	RI Index AMC I	RI Index AMC II	RI Index AMC III
22	5.54 Ac.	Urban Landscaping	Good Cover		20	30	50	50	69	84
								0	0	0
								0	0	0
	5.54 Ac.						Weighted Average RI Numbers =	50.0	69.0	84.0

Per Dr. Luis Parra, the AMC condition is based on the rainfall record. Applying NEH-4 (1964) for the non-freezing conditions in Riverside County the AMC conditions are: AMC-I for less than 0.5" of rain the previous 5 days; AMC-II for between 0.5" to 1.1" of rain the previous 5 days; or AMC-III for more than 1.1" for the previous 5 days.

			First result out of compliance in the rainfall record				See below for the Height in the Basin (Stage) that is causing a non-compliant result	
			Requirement		Proposed			
Hydromod Ponded depth	1.30 feet							
Hydromod Drain Time (unclogged)	45.38 hours							
Is the HydroMod BMP properly sized?	Yes, this is acceptable		---	---	---	---		
Mitigated Q < 110% of Pre-Dev. Q?	Yes, this is acceptable		---	---	---	---	Issue @ Stage =	---
Mitigated Duration < 110% of Pre-Dev?*	Yes, this is acceptable		---	---	---	---	Issue @ Stage =	---

Responsible-in-charge: _____ Date: _____

Signature: _____

Spreadsheet Developed by: Benjie Cho, P.E.

It is expressly agreed and understood by the USER of this Excel Spreadsheet file (file) released hereby (whether released in digital or hard copy form) that Riverside County (County) makes no representation as to its accuracy. Further, it is the intent of the parties hereto that the USER shall review and verify calculations, analyze results, and/or independently determine the accuracy thereof prior to placing any reliance whatsoever on the information. Further, the USER shall hold the County, together with the officers, agents and employees of each, free and harmless from any liability whatsoever, including wrongful death, based or asserted upon any act or omission of the District or County, their officers, agents, employees or subcontractors, relating to or in any way connected with the unauthorized use of these files or information; and USER agrees to protect and defend, including all attorney fees and other expenses, each of the foregoing bodies and persons in any legal action based or asserted upon any such acts or omissions. USER also agrees not to sell, reproduce or release these files to others for any purpose whatsoever, except those incidental uses for which the files were acquired, verified and combined with USER'S own work product. Reasonable effort was made to fully comply with the San Diego M84 Permit requirements using the methods found in the Riverside County Hydrology Manual. If the user finds an error in any way, please contact the County so that the error can be corrected. Any direct tampering of the equations in this spreadsheet would be considered extremely inappropriate, and potentially fraudulent.

BMP Design

Fill in blue shaded areas

BMP Geometry & Detention Calculations

0.1 feet, Stage Intervals

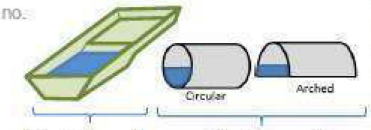
Increase intervals or decrease height

Height is above the limits of this sheet

PROPOSED BMP DIMENSIONS

STEP1: Size the BMP, so that the Total Volume > Max HydroMod Vol. (Deeper is ok, it will be refined in the Design Geometry)

Is the BMP a Tank shape? 2 1 for yes; 2 for no.



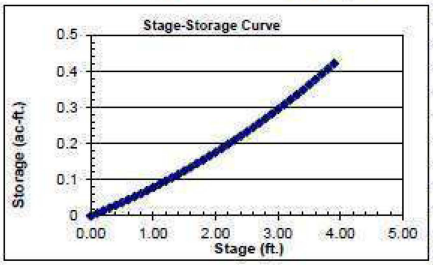
"Basin Shaped" "Tank Shaped"

Basin Shaped BMP (Bottom Stage 1st)

Bottom Stage H= 5.0' SS= 3 :1

	Top Area		Bottom Area	
Width	60	Width	30	FT
Length	130	Length	100	FT
area =	7800	area =	3000	

Top Stage H= 0.0'

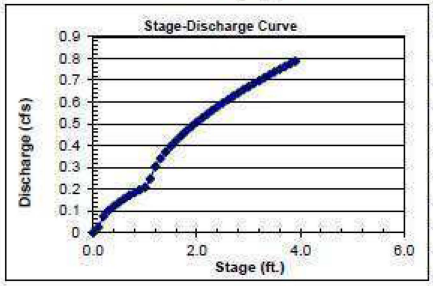


Prop. Top Stg. Vol. =	-	FT3
Prop Bottom Stg Vol =	26,062	FT3
Total Prop. Volume[1] =	26,062	FT3
Max HydroMod Volume =	4,422	FT3
Total Acreage[2] =	7,800	FT2
BMP % of Site =	3.23%	
Max HydroMod Depth[3] =	1.30	FT

[1]Does not include forebay, or low flow trench

[2]Does not account for freeboard or access roads

[3]Does not consider Increased Runoff



MINIMUM DESIGN GEOMETRY

STEP3: Delete outlets, then propose the largest lowest orifice that does not, exceed the ex. Q or Duration. If the Q is acceptable, but the duration is exceeded, try decreasing orifice, then adding a weir slightly below the stage that has an issue.

OUTLETS (for Stage-Discharge)

Orifice Outlets			Weir Outlets		
Invert Height (ft)	Diameter (inches)	No. of Orifices	Crest Height (ft)	Crest Width (ft)	No. of Weirs
0	2.00	2			
1	2.00	2			

Hydromod Depth = 1.30 FT

+ 1' Freeboard = 2.30 FT

Top Surface Area

Based on HydroMod Depth +1' of Freeboard

Bottom Stage		
Width	60	FT
Length	130	FT

Stage-Storage-Discharge

Stage (FT)	Storage (AC-FT)	Storage (FT3)	Q (CFS)
0	0	0	0
0.10	0.007	304	0.02
0.20	0.014	616	0.07
0.30	0.021	935	0.10
0.40	0.029	1263	0.12
0.50	0.037	1599	0.14
0.60	0.045	1943	0.16
0.70	0.053	2295	0.17
0.80	0.061	2656	0.18
0.90	0.069	3025	0.20
1.00	0.078	3402	0.21
1.10	0.087	3788	0.25
1.20	0.096	4182	0.30
1.30	0.105	4585	0.34
1.40	0.115	4997	0.37
1.50	0.124	5418	0.40
1.60	0.134	5848	0.42
1.70	0.144	6286	0.45
1.80	0.155	6734	0.47
1.90	0.165	7190	0.49
2.00	0.176	7656	0.51
2.10	0.187	8131	0.53
2.20	0.198	8615	0.55
2.30	0.209	9109	0.56
2.40	0.221	9612	0.58
2.50	0.232	10125	0.60
2.60	0.244	10647	0.61
2.70	0.257	11179	0.63
2.80	0.269	11721	0.64
2.90	0.282	12273	0.66
3.00	0.295	12834	0.67
3.10	0.308	13405	0.69
3.20	0.321	13987	0.70
3.30	0.335	14578	0.71
3.40	0.348	15180	0.73
3.50	0.363	15792	0.74
3.60	0.377	16414	0.75
3.70	0.391	17047	0.76
3.80	0.406	17690	0.78
3.90	0.421	18344	0.79
	0.421	18,344	

STEP4: Complete an increased runoff analysis, if the project can impact downstream properties. Incorporate these designs into the WQMP site plan. Add emergency overflow weir, for flows that exceed the Hydromod volumes, sized to the 100-year peak flow rate. Add access roads (< 10% longitudnal slope) with enough width & turn around access for equipment that would be needed to scarify the bottom or remove Bioretention soil media.

Add Infiltration

Enter information from actual infiltration tests

Yes	Consider Infiltration (Yes or No)?		
0.1	Infiltration rate (in/hr) [3]	0.0069	ft3/sec, Infiltration (over entire bottom)
3	Factor of Safety (3 or greater) [3]	0.0023	ft3/sec, Infiltration / Factor of Safety
300	mins, Max. Time represented by tests		

[3]Per the RC LID Manual, Appendix A.

Only if allowed by the Co-Permittee, these infiltration inputs can be used to simulate Bioretention/Biofiltration rates with Backup Calcs and Data.

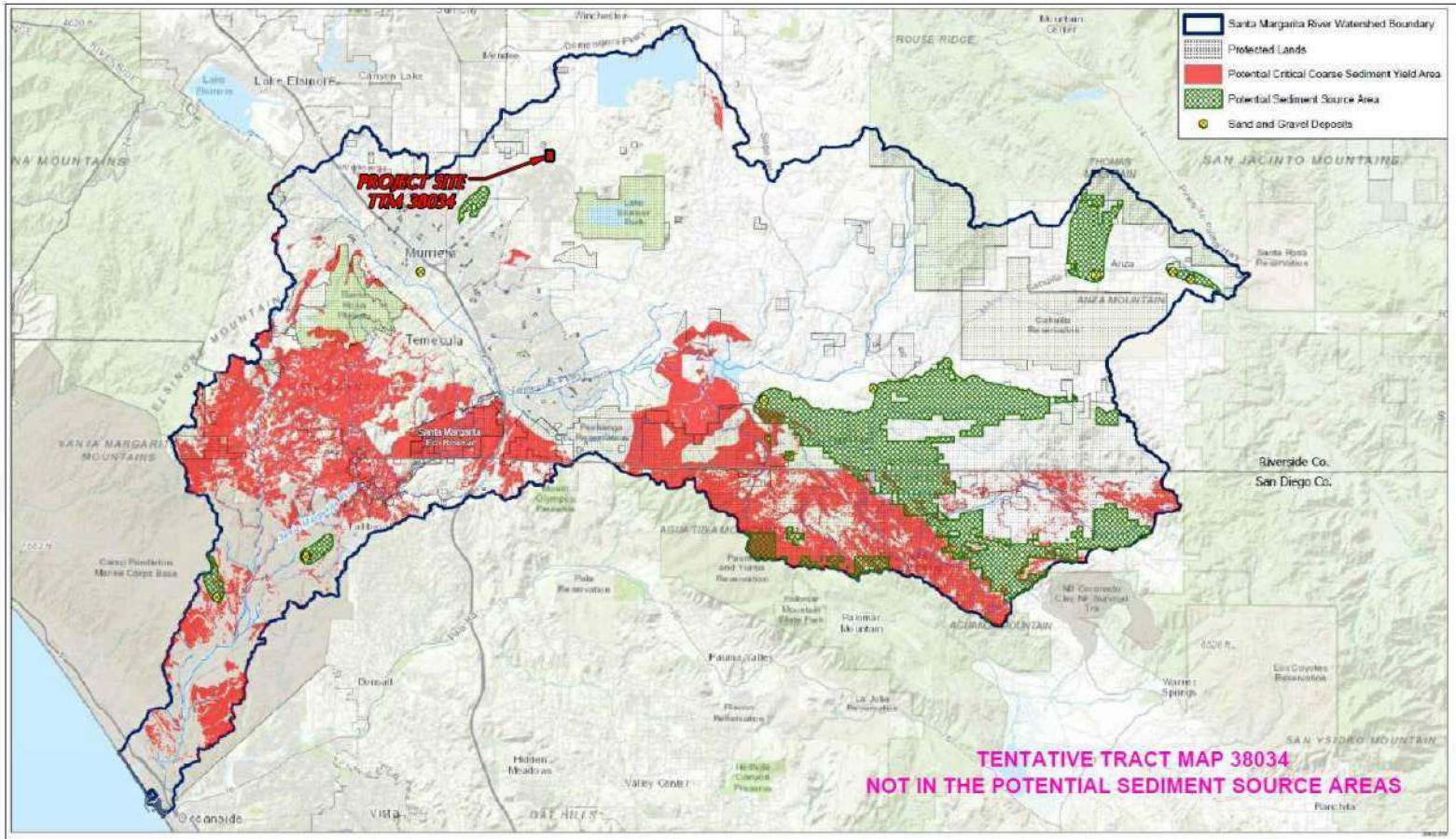


Exhibit G-1

SANTA MARGARITA RIVER WATERSHED
POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS AND POTENTIAL SEDIMENT SOURCE AREAS

K&A Engineering, Inc.
ENGINEERING
LAND PLANNING
SURVEYING
357 N. SHERIDAN STREET
SUITE 117
CORONA, CALIFORNIA 92880
TEL. (951) 279-1800
FAX (951) 279-4380

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

For Final WQMP, include a copy of the completed Pollutant Sources/Source Control Checklist in the subsequent pages and summarize Source Control BMPs in Section H of this Template.

Appendix 8
STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section H of the 2018 SMR WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table H.1 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	**... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE**		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **A.** On-site storm drain inlets	❑ Locations of inlets.	❑ Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	❑ Maintain and periodically repaint or replace inlet markings. ❑ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ❑ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ❑ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
❑ **B.** Interior floor drains and elevator shaft sump pumps		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.

Appendix 8
STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **D1.** Need for future indoor & structural pest control		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.
❑ **D2.** Landscape/ Outdoor Pesticide Use	❑ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show stormwater treatment and hydrograph modification management BMPs.	State that final landscape plans will accomplish all of the following. ❑ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ❑ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ❑ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at: http://www.rcwatershed.org/about/materials-library/#1450469138395-bb76dd39-d810 ❑ Provide IPM information to new owners, lessees and operators.

Appendix 8

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at: http://www.rcwatershed.org/about/materials-library/#1450469201433-f5f358c9-6008
❑ **F.** Food service	❑ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	❑ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9 Provide this brochure to new site owners, lessees, and operators.
❑ **G.** Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

Appendix 8
STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **H.** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at: http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank www.cchealth.org/groups/hazmat/	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

Appendix 8
STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **J.** Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at: http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9 ❑ Car dealerships and similar may rinse cars with water only.

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STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations; "Outdoor Cleaning Activities;" and "Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants. Brochures can be found at: http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9

Appendix 8
STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
❑ **L.** Fuel Dispensing Areas	❑ Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

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❑ **M.** Loading Docks	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-**30**, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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❑ **N.** Fire Sprinkler Test Water		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim. ❑ Other sources		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. ❑ Include controls for other sources as specified by local reviewer.	

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❑ **P.** Plazas, sidewalks, and parking lots.			❑ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

For the Final WQMP the following information shall be provided:

1. Maintenance Plan per Section 5.3.5 of the WQMP Guidance Document. County will regularly inspect BMPs, so BMPs without access (e.g. backyards, etc) will be rejected. Due to liability, the County does not allow for overlapping private maintenance in the public right-of-way.
2. For all projects, include one wet-signed and notarized hardcopy of the BMP Maintenance agreement. Please note, references to Exhibit A and B on Page 1can be struck out if the entire parcel is mentioned in the "Legal Description" on Page 1 of the agreement. Otherwise see below for Exhibit A and B standards. For BMP agreement, ensure that the name on the agreement matches throughout and the notary sheet, Notary shall be the latest California format, the date of the agreement is the date of the notary, all text does not exceed the margins, then the County will sign, attest & record
3. For Tracts, contact County EDA regarding maintenance determinations/formations. Include a completed Exhibit B.9 - WQMP O&M Cost Sheet.xlsx that is signed by both the preparer (to ensure quantities are correct) and the owner (to understand the maintenance obligations in perpetuity) & an Approved Maintenance Exhibit from EDA.
4. For Tracts or any project , written documentation from the maintenance entity that they are willing to maintain (e.g. CFD, CSA, L&LMD, etc.)

BMP EXHIBIT "A" STANDARDS

1. Use the legal description of the parcel as shown on the tentative exhibit. If not available, use the one in the most current title report.
2. As a backup, if the project is a map the description of the future lot may be included for reference

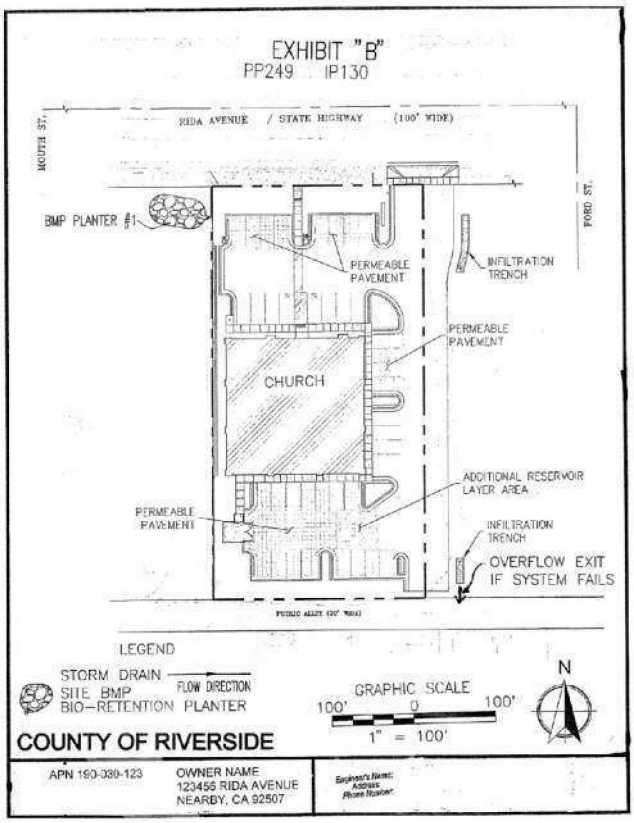
BMP EXHIBIT "B" STANDARDS

1. 0.12" minimum lettering
2. Sheet size must be 8.5" x 11"
3. Show Street names, north arrow
4. Indicate point of flow exit into street if basin system fails
5. Indicate Q100 of flow exit into street
6. Indicate direction of flow exit into street
7. Indicate by notation and/or show nearest downstream drainage facility (catch basin, culvert, riser, etc)
8. Show "Exhibit A", IP and project number (TR, PM, PUP, PP etc)
9. Title block, signature block, engineer seals, USA note is not necessary on Exhibit
10. Show scale used for drawing, provide 4" graphic scale

MAINTENANCE EXHIBIT "B" STANDARDS

1. 0.12" minimum lettering
2. Sheet size must be 8.5" x 11"
3. Show street names, north arrow
4. Show "Exhibit A", IP and project number (TR, PM, PUP, PP etc)
5. Title block, signature block, engineer seals, USA note is not necessary on Exhibit
6. Show scale used for drawing, provide 4" graphic scale

BMP EXHIBIT B EXAMPLE



Recorded at the request of:
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT

THIS INSTRUMENT IS FOR THE BENEFIT
OF THE COUNTY OF RIVERSIDE AND
ENTITLED TO BE RECORDED WITHOUT
FEE.(GOV. CODE 6103)

RETURN TO:
RIVERSIDE COUNTY TRANSPORTATION
DEPARTMENT. **STOP NO. 1080**
4080 LEMON STREET
RIVERSIDE, CA 92501

COVENANT AND AGREEMENT REGARDING WATER QUALITY MANAGEMENT PLAN BMP, CONSENT TO INSPECT, MAINTENANCE AND INDEMNIFICATION

APN:_____ **PROJECT No.**_____ **IP No.**_____

OWNER(S):_____

PROPERTY ADDRESS:_____

LEGAL DESCRIPTION:_____
_____
_____

THIS AGREEMENT is made and entered into in Riverside County, California, this _____ day of _____ Year_____, by and between_____, (hereinafter referred to as "Covenantor" or "Owner") and the COUNTY OF RIVERSIDE via its Department of Transportation, a political subdivision of the State of California (hereinafter referred to as "County").

RECITALS

WHEREAS, the Covenantor owns real property ("Property") in the County of Riverside, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of these exhibits is attached, and incorporated herein by this reference;

WHEREAS, the County is the owner of interests in that certain real property within the unincorporated area of the County of Riverside, State of California, containing storm drains, pipelines, and related appurtenances constituting the County's municipal separate storm sewer system (the County's "MS4");

WHEREAS, Covenantor intends to develop, improve, and/or use the Property is such a way that approval by the County for such development, improvement, and/or use is required pursuant to applicable laws;

WHEREAS, As a condition for said approval by the County, County required Covenantor, and Covenantor desires to, restrict the use of the Property according to the conditions, covenants, equitable servitudes, and restrictions contained herein for the express benefit of the County's MS4, which include requirements that the Property incorporate post construction on-site stormwater quality control measures;

WHEREAS, the Covenantor/Owner has chosen to install one or more _____, hereinafter referred to as "Device", as the on-site control measure to minimize pollutants in urban runoff;

WHEREAS, said Device has been installed in accordance with plans and specifications accepted by the County;

WHEREAS, said Device, with installation on private property and draining only private property, is a private facility with all maintenance or replacement, therefore, the sole responsibility of the Covenantor/Owner in accordance with the terms of this Agreement;

WHEREAS, the Covenantor/Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of Device and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining; to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, incorporating the foregoing Recitals and in consideration of the covenants and conditions contained herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and expressly for the benefit of, and to bind, their sucessors in interest, the parties hereto agree as follows:

1. Covenantor/Owner hereby provides the County or County's designee complete access to the Device and its immediate vicinity and such access onto the property to permit access to the devise at any time, upon twenty-four *(24)* hour advance notice in writing, of any duration for the purpose of inspection, sampling and testing of the Device. County shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.

2. Covenantor/Owner shall use its best efforts diligently to maintain the Device in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of material(s) from the Device and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested

from time to time by the County / Regional Water Quality Control Board (RWQCB), the Owner shall provide the RWQCB with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. In the event Covenantor/Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the County, the County is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs and interest thereon at the maximum rate authorized by the Civil Code from the date of notice of expense until paid in full.

4. The County may require the Covenantor/Owner to post security in a form and for a time period satisfactory to the County to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under this Agreement, the County may, in the case of a cash deposit, certificate of deposit or letter of credit, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement.

5. The County may, but shall not be obligated to, enforce this Agreement by a proceeding at law or in equity against any person or persons violating or attempting to violate any condition, covenant, equitable servitude, or restriction provided for herein, either to restrain such violation or to recover damages.

6. This Agreement constitutes the entire agreement and understanding between the parties with respect to the subject matter of this Agreement and supersedes all prior or contemporaneous agreements and understandings with respect to the subject matter hereof, whether oral or written.

7. If any part of this Agreement is declared by a final decision of a court of competent jurisdiction to be invalid for any reason, such shall not affect the validity of the rest of the Agreement. The other parts of this Agreement shall remain in effect as if this Agreement had been executed without the invalid parts(s). The parties declare that they intend and desire that the remaining parts of this Agreement continue to be effective without any part(s) that have been declared invalid.

8. This Agreement may be executed in counterparts, each of which so executed shall, irrespective of the date of its execution and delivery, be deemed an orginal, and all such counterparts together shall constitute one and the same instrument.

9. This Agreement shall be recorded in the Office of the Recorder of Riverside County, California and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth.

10. In the event of legal action occasioned by any default or action of the Covenantor/Owner, or its successors or assigns, then the Covenantor/Owner and its

successors or assigns agree(s) to pay all costs incurred by the County in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

11. Covenantor/Owner agrees to indemnify, defend, and hold harmless the County, its elected officers, employees, agents, and contractors from and against any and all liability, expense, including costs and reasonable legal fees, and claims of damage of any nature whatsoever including, but not limited to, death, bodily injury, personal injury, or property damage arising from or connected with the County inspection of the Property except where such liability, expense, or claim for damage results from the sole negligence or willful misconduct of the County.

12. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien thereon against.

13. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto and any other present or future interest holders or estate holders in the property. The term "Owner" shall include not only the present Owner, but also its heirs, successors in interest and in title to the property, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the County at the same time such notice is provided to the successor.

14. Time is of the essence in the performance of this Agreement.

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15. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two *(72)* hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

COVENANTOR/OWNER NAME:

COUNTY:

Riverside County Department of Transportation
Attn: Transportation Director
4080 Lemon Street
Riverside, CA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT

Patricia Romo, P.E.
Director of Transportation

Date

(Attest)

Date

COVENANTOR/OWNER

Signature of Covenantor/Owner

(Print Name)

(Print Title)

Attach Notary

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

For the Final WQMP, examples of material to provide in Appendix 10 may include but are not limited to the following:

- BMP Fact Sheets for proposed BMPs form Exhibit C: LID BMP Design Handbook of the SMR WQMP,
- Source control information and training material for site owners and operators,
- O&M training material,
- Other educational/training material related to site drainage and BMPs.