APPENDIX C.6 – STORMWATER QUALITY MANAGEMENT PLAN WITH DRAINAGE STUDY

County of San Diego

Stormwater Quality Management Plan (SWQMP)
For Priority Development Projects (PDPs)

Use for all PDPs (see Storm Water Intake Form, Part 4)

Priority Development Project

Project Information	**Development type** ☒ New development ☐ Redevelopment	
Project Name	Valley View Bonita	
Project Address	3410 Valley Rd, Bonita, CA	
Assessor's Parcel # (APN)	591-100-27 & 31	
Permit # / Record ID	TBD	
Project category (select one)	☐ Commercial	☐ Minor subdivision*
	☐ Industrial	☒ Major subdivision*
	☐ Single family residential lot	☐ Multi-family residential*
	*If residential, is a Homeowners Association (HOA) proposed? ☒ Yes ☐ No	

Project Applicant / Project Proponent		
Name	Arturo Valdez	
Address	2577 Univeristy Ave.	
Phone	619-942-1915	**Email:** NA

SWQMP Preparer		
Name	Dr. Luis Parra	
Company (if applicable)	REC Consultants, Inc.	
Address	2442 2nd Ave, San Diego, CA 92101	
Phone	(619) 232-9200	**Email:** luis@rec-consultants.com
PE Number (if applicable)	66377	

Preparer's Certification

I understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the County of San Diego BMP Design Manual. The BMP Design Manual is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Order No. R9-2015-0100) requirements for storm water management.

This SWQMP is intended to comply with applicable requirements of the BMP Design Manual. I certify that it has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this SWQMP by County staff is confined to a review and does not relieve me as the person in charge of overseeing the selection and design of storm water BMPs for this project, of my responsibilities for project design.

Signature	**Date** October 17, 2022

COUNTY ACCEPTED

SWQMP Approved By: *Approval Date*:

**** NOTE* Approval does not constitute compliance with regulatory requirements.***

Scope of SWQMP Submittal (Required)

Select the option that describes the scope of this SWQMP Submittal. Document your selection as indicated.

SWQMP Scope	Required Documentation
☒ ***a. SWQMP addresses the entire project***	No additional documentation.
☐ ***b. SWQMP implements requirements of an earlier master SWQMP submittal***	Include a copy of the previous submittal as **Attachment 4**.
☐ ***c. First of multiple SWQMP submittals***	Identify below the elements addressed in this submittal and in future submittals.

(1) Elements addressed in current submittal (streets, common areas, first project phase, etc.):

(2) Elements to be addressed in future submittal(s) (individual lots, future project phases, etc.):

Submittal Record: List the dates of SWQMP and plan submittals and updates. Briefly describe key changes from previous versions. If responding to plan check comments, note this in the entry and attach the responses as applicable.

No.	Date	Summary of Changes
Preliminary Design / Planning / CEQA		
1	10/17/2022	Initial Submittal
2	4/25/2023	2nd Submittal
3	Date	Summary of Change
No.	Date	Summary of Change
Final Design		
1	Date	Initial Submittal
2	Date	Summary of Change
3	Date	Summary of Change
No.	Date	Summary of Change
Plan Changes		
1	Date	Initial Submittal
2	Date	Summary of Change
3	Date	Summary of Change
No.	Date	Summary of Change

General Directions

Note: These directions may be omitted from the print version of the SWQMP submittal.

① Scope of SWQMP Submittal and Submittal Record (inside front cover)

Use the ***Submittal Scope*** table to document the scope of activities covered under this SWQMP Form. Select one of the three options presented.

- ***SWQMP addresses the entire project***. If this SWQMP form addresses the entire project from start to finish, additional documentation of the project scope is not required.
- ***SWQMP implements requirements of an earlier master SWQMP submittal***. If this SWQMP Form implements requirements identified in an earlier master SWQMP Form, documentation of those earlier requirements must be provided. Include a copy of the previous submittal as **Attachment 4**.
- ***First of multiple SWQMP submittals***. If this is the first of multiple SWQMP submittals, use the spaces provided under Part c to identify and briefly describe which project elements are addressed in this submittal and which ones will be addressed in future submittals. For example, this PDP addresses only streets and roads, but individual lots will be documented in future submittals.

Use the ***Submittal Record*** table to list the dates of any updates to the SWQMP or construction plans. Briefly describe key changes from previous versions. If responding to plan check comments, note this in the entry and attach the responses as applicable.

② PDP SWQMP Submittal Checklist

The checklist on Page 1 summarizes the tables and attachments to be included with this PDP SWQMP submittal. It should be filled out after completing the remainder of the form. Tables and attachments with boxes already checked (☒) are required for all projects. All tables are required. The applicability of attachments not already checked will be identified during the completion of this form.

③ Attachment 1: Stormwater Intake Form

Submit a copy of your completed ***Storm Water Intake Form*** as **Attachment 1**.

④ Tables 1, 2, and 3: Baseline Site Design and Source Control BMPs

Table 1 Completion: Complete **Table 1** to document existing and proposed site features and the BMPs to be implemented for them. All BMPs must be implemented ***where applicable and feasible***. Applicability is generally assumed if a feature exists or is proposed.

Table 2 Completion: Table 2 is not required for Small Residential Projects. Applicants <u>should check the box at the top of the table to confirm it does not apply.</u>

Small Residential Projects are those requiring *either:* a Building Permit, Minor Residential Grading Permit, or Site Plan Permit for a single family home; *or* a Tentative Parcel Map Permit for up to 4 single family homes and a remainder parcel.

All other projects must complete **Table 2** to identify applicable requirements for documenting pollutant-generating sources/ features and source control BMPs.

BMPs must be implemented for **Table 1** and **2** features ***where feasible***. Leaving the box for a BMP unchecked means it will not be implemented (either partially or fully) either because it is inapplicable or infeasible. Explanations must be provided in **Table 3**. Tables 1 and 2 both provide specific instructions on when explanations are required.

⑤ Attachment 5: Existing Site and Drainage Description

Complete **Attachment 5** to provide a description of (1) the existing pre-development condition of the site, and (2) existing and proposed drainage conditions for the site. If required, include a copy of the site Drainage Study with Attachment 5.

⑥ Structural Performance Standards

Determine which Structural Performance Standards apply to the PDP, where they apply, and which compliance strategies you will use to satisfy them. Record your selections in **Table 4** as follows.

Table 4, Part A.1, Selection of Standards: First select the standards that apply to the project.

- *Pollutant control plus hydromodification* — Select if the PDP is not exempt from hydromodification management requirements. It must satisfy both the Pollutant Control Performance Standard (BMPDM Section 2.2) and the Hydromodification Management Performance Standard (BMPDM Section 2.3).
- *Pollutant control only* — Select if the PDP is exempt from hydromodification management requirements per BMPDM Section 6.1. Document the exemption in **Attachment 9**.

Table 4, Part A.2, Application of Standards: Next indicate where on the site the standards apply.

- If this is a **New Development Project**, the standards apply to all impervious surfaces on the site.
- If this is a **Redevelopment Project**, their applicability will depend on the ratio of created or replaced impervious areas to existing impervious areas (see BMPDM Section 1.7). Complete the calculations in the table to determine your obligation. The **percent (%) impervious created or replaced (c)** is determined by dividing the **impervious area created or replaced (b)** by the **existing impervious area (a)** and multiplying the result by 100.
  - **If c is 50% or more**: The standards apply to all impervious surfaces on the site (a + b).
  - **If c is less than 50%**: The standards apply only to created or replaced impervious surfaces (b only).

Table 4, Part B.1: Summary of Required Attachments (1 through 5)

Use this part of the table to summarize which of Attachments 1 through 5 will be included with the SWQMP submittal. If you are completing an **electronic version** of this form, your selections will be automatically recorded based on your previous input. If you are completing a **hard copy** of this form, you must manually select Attachments 3 and 4 as applicable (see pages 4 and 6). Note that Attachments 1,2, and 5 are required for all projects.

Table 4, Part B.2: Selection of Compliance Strategies

Complete Part B.2 to document which compliance options will be used to satisfy the applicable standards for the site. Before doing so, you must determine which option will be used for each DMA. The following four potential design options are presented in detail in BMPDM Chapters 5 and 6.

1. **Self-mitigating DMAs** (BMPDM Section 5.2.1)
2. **De Minimis DMAs** (BMPDM Section 5.2.2)
3. **Self-retaining DMAs** (BMPDM Section 5.2.3)
4. **Structural BMPs**
   - Pollutant Control BMPs (BMPDM Sections 5.4)
   - Hydromodification BMPs (BMPDM Chapter 6)
   - Alternative Compliance Project (BMPDM Section 1.8)

Only one compliance option may be used per individual DMA. Regardless of which option is selected for any DMA, it must fully satisfy the applicable standard(s) determined in Part A.1.

On the left side of Part B, check the applicable boxes for each compliance option to be used.

⑦ Summary of Additional Required Attachments (6 through 12)

You must complete and submit each attachment identified for the compliance options selected. Applicable attachments are listed to the right of each compliance option. If you are completing an **electronic version** of this form, the required attachments for each design option will automatically be selected when you choose the compliance option. As noted above, these selections will also be recorded on the PDP SWQMP Submittal Checklist (Page 1). If you are completing a **hard copy** of this form, you will need to manually check the boxes for each applicable attachment on both pages.

Note that Attachment 9 (Critical Coarse Sediment Yield Areas) is required for all PDPs. If the PDP is exempt from hydromodification requirements, the exemption must be documented in Attachment 9.

⑧ Table 5: Critical Coarse Sediment Yield Area Requirements

Complete **Table 5** to select a compliance pathway for addressing Critical Coarse Sediment Yield Area (CCSYA) requirements for the PDP. See BMPDM Appendix H for additional description of requirements and options. Document Table 5 selections, including hydromodification management exemptions, in **Attachment 9**.

⑨ Tables 6 and 7: Temporary Construction Phase BMPs

Complete **Table 6** to document the minimum construction BMPs to be implemented for the project. Each BMP must be implemented ***where applicable and feasible***. At least one BMP must be selected for each construction activity listed in the table (except Erosion Control for Disturbed Slopes, which requires one BMP per season).

If applicable, use **Table 7** to describe why BMPs not selected in Table 6 are either infeasible or are only partially feasible. Justifications must be provided for all construction activity types for which NO BMPs were selected. If requested by County staff, also justify why specific individual BMPs were not selected.

⑩ Attachment 2: DMA Exhibits and Construction Plans

Exhibits and construction plan sets incorporating all applicable site features, activities, and BMPs identified in **Tables 1, 2, and 6** must be submitted as **Attachment 2 (DMA Exhibits and Construction Plan Sheets)**. See the Attachment 2 cover sheet for additional instructions.

PDP SWQMP Submittal Checklist

SWQMP Tables: All of the tables below must be completed.

☒ Table 1: Baseline BMPs for Existing and Proposed Site Features ..... Page 2

☒ Table 2: Baseline BMPs for Pollutant-generating Sources ..... Page 3

☒ Table 3: Explanations and Justifications for Table 1 and 2 Baseline BMPs ..... Page 4

☒ Table 4: DMA Structural Compliance Strategies and Documentation ..... Page 5

☒ Table 5: Critical Coarse Sediment Yield Area (CCSYA) Requirements ..... Page 6

☒ Table 6: Minimum Construction Stormwater BMPs ..... Page 7

☒ Table 7: Explanations and Justifications for Construction Phase BMPs ..... Page 8

SWQMP Attachments[1]: Use the checklist below to identify which attachments will be included with this submittal. Attachments with boxes already checked (☒) are required for all projects. The applicability of other attachments will be determined upon completing this form.

☒ Attachment 1: Storm Water Intake Form

☒ Attachment 2: DMA Exhibits and Construction Plan Sheets

☐ Attachment 3: Reserved for Future Use

☐ Attachment 4: Previous SWQMP Submittals

☒ Attachment 5: Existing Site and Drainage Description

☐ Attachment 6: Documentation of DMAs without Structural BMPs

☒ Attachment 7: Documentation of DMAs with Structural Pollutant Control BMPs

☒ Attachment 8: Documentation of DMAs with Structural Hydromodification Management BMPs

☒ Attachment 9: Management of Critical Coarse Sediment Yield Areas

☒ Attachment 10: BMP Installation Verification Form

☒ Attachment 11: BMP Maintenance Agreements and Plans

☐ Attachment 12: Documentation of Alternative Compliance Projects (ACPs)

After completing the remainder of this form, check the applicable SWQMP Attachment boxes to summarize your selections.

[1] All SWQMP Attachments are available at www.sandiego.gov/stormwater under the Development Resources tab, Submittal Templates.

Table 1 – Baseline BMPs for Existing and Proposed Site Features

A. BMPs for Existing Natural Site Features (See Fact Sheet BL-1)

1. Check the boxes below for each existing feature on the site.

2. Select the BMPs to be implemented for each identified feature. Explain why any BMP not selected is infeasible in Table 3.

	Conserve natural features (SD-G)	Provide buffers around waterbodies (SD-H)
☐ Natural waterbodies	☐	☐
☐ Natural storage reservoirs & drainage corridors	☐	---
☒ Natural areas, soils, & vegetation (incl. trees)	☒	---

B. BMPs for Common Impervious Outdoor Site Features (See Fact Sheet BL-2)

1. Check the boxes below for each proposed feature.

*2. Select the BMPs to be implemented for each proposed feature. If neither BMP **SD-B** nor **SD-I** is selected for a feature, explain why both BMPs are infeasible in Table 3.*

	a. Direct runoff to pervious areas (SD-B)	b. Construct surfaces from permeable materials (SD-I)	c. Minimize the size of impervious areas
☒ Streets and roads	☒	☐	☒ *Check this box to confirm that all impervious areas on the site will be minimized where feasible.*
☒ Sidewalks & walkways	☒	☐	
☐ Parking areas & lots	☐	☐	
☒ Driveways	☒	☐	*If this box is not checked, identify the surfaces that cannot be minimized in Table 3, and explain why it is infeasible to do so.*
☐ Patios, decks, & courtyards	☐	☐	
☐ Hardcourt recreation areas	☐	☐	
☐ Other:	☐	☐	

C. ☒ **BMPs for Rooftop Areas:** *Check this box if rooftop areas are proposed and select at least one BMP below.* **(See Fact Sheet BL-3)**

If no BMPs are selected, explain why they are infeasible in Table 3.

1. Direct runoff to pervious areas (SD-B)	2. Install green roofs (SD-C)	3. Install rain barrels (SD-E)
☒	☐	☐

D. ☒ **BMPs for Landscaped Areas:** *Check this box if landscaping is proposed and select at least one BMP below.* **(See Fact Sheet BL-4)**

If no BMPs are selected, explain why they are infeasible in Table 3.

1. Sustainable Landscaping (SD-K)
☒

Note: All features and BMPs must be shown on applicable construction plans. See applicable Fact Sheets in Appendix C of the BMP Design Manual for additional information.

Note: Use Table 3 to explain BMP infeasibility or inapplicability, or to describe features or BMPs not listed in this table. Additional explanation may be required by the County.

Table 2 – Baseline BMPs for Pollutant-generating Sources

☐ If this is a **Small Residential Project**, check this box and skip the rest of this table.

A. Management of Stormwater Discharges

1. Identify all proposed outdoor work areas below (☒ *Check here if none are proposed*)	**2. Which BMPs will be used to prevent materials from contacting rainfall or runoff?** (See Fact Sheet BL-5) *(Select all feasible BMPs for each work area[2])*			**3. Where will runoff from the work area be routed?** (See Fact Sheet BL-6) *(Select one or more option for each work area)*			
	Overhead covering (rooftops, etc.) (SC-A)	**Separation of flows from adjacent areas (berms, etc.) (SC-B)**	**Wind protection (screens, etc.) (SC-C)**	**Sanitary sewer[3] (SC-D)**	**Containment system (SC-E)**	**Stormwater S-BMP or SSD-BMP[4]**	**Other[5]**
☐ Trash & Refuse Storage	☐	☐	☐	☐	☐	☐	☐
☐ Materials & Equipment Storage	☐	☐	☐	☐	☐	☐	☐
☐ Loading & Unloading	☐	☐	---	☐	☐	☐	☐
☐ Fueling	☐	☐	---	☐	☐	☐	☐
☐ Maintenance & Repair	☐	☐	---	☐	☐	☐	☐
☐ Vehicle & Equipment Cleaning	☐	☐	---	☐	☐	☐	☐
☐ Other:	☐	☐	---	☐	☐	☐	☐

B. Prevention of Non-stormwater Discharges (See Fact Sheet BL-7)

Select one option for each feature below:

• **Storm drain inlets and catch basins …**	☐ are not proposed	☒ will be labeled with stenciling or signage to discourage dumping **(SC-F)**
• **Educational BMP Signage …**	☐ are not proposed	☒ will be labeled with educational signage for BMP **(SC-G)**
• **Interior work surfaces, floor drains, & sumps …**	☒ are not proposed	☐ will not discharge directly or indirectly to the MS4 or receiving waters
• **Drain lines (e.g., air conditioning, boiler, etc.) …**	☒ are not proposed	☐ will not discharge directly or indirectly to the MS4 or receiving waters
• **Fire sprinkler test water …**	☒ are not proposed	☐ will not discharge directly or indirectly to the MS4 or receiving waters

Note: All outdoor features and BMPs in this table must be shown on applicable construction plans. See applicable Fact Sheets in Appendix C of the BMP Design Manual for additional information.

Note: Use Table 3 to explain BMP infeasibility or inapplicability, or to describe features or BMPs not listed in this table. Additional explanation may be required by the County.

[2] Each BMP is required where feasible. If none are selected for any feature, explain why they are infeasible in Table 3.

[3] Separate wastewater agency approvals may be required.

[4] Structural Treatment Control BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) may not receive discharges from work areas that concentrate pollutants in a manner that will impair their functioning. Discharges from the proposed work area must also be included in DCV calculations for the applicable BMP.

[5] Describe other proposed options for managing stormwater discharges in Table 3.

Table 3 – Explanations and Justifications for Table 1 and 2 Baseline BMPs

☒ **Check here if no explanations or justifications for Table 1 or 2 BMPs are required.**

- **Required Justifications**: Provide explanations of BMP inapplicability and/or infeasibility as indicated per Tables 1 and 2.
- **If Requested**: Justify why specific BMPs will not be implemented or will only be partially implemented.
- **Additional Explanation**: Describe any proposed features and/or BMPs not listed in Tables 1 or 2.

BMP-Feature Combination		Explanation
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	
Feature	Feature	Explanation
BMP	BMP	

Table 4: DMA Structural Compliance Strategies and Documentation

Part A – Selection and Application Structural Performance Standards

1. Selection of Standards (select one; see BMPDM Section 6.1)

☒ a. Pollutant control + hydromodification ☐ b. Pollutant control only (project is exempt from hydromodification requirements)

2. Application of Structural Performance Standards (select one; see BMPDM Section 1.7)

☒ **New Development Projects:** Standards apply to all impervious surfaces.

☐ **Redevelopment Projects:** Complete the calculations below. Select the applicable scenario based on the results.

a. Existing impervious area (ft^2)	b. Impervious area created / replaced (ft^2)	c. % Impervious created / replaced [(b/a)*100]
3,020	43,485	1,440%

☒ *Scenario 1: c is 50% or more*: Performance standards apply to all impervious surfaces (a + b).

☐ *Scenario 2: c is less than 50%*: Performance standards apply only to created or replaced impervious surfaces (b only).

Part B – Compliance Strategies and Required Attachments

1. *Complete and submit each of the applicable attachments on the right.*

Att. 1	Att. 2	Att. 3	Att. 4	Att. 5
Storm Water Intake Form ☒	DMA Exhibits and Construction Plan Sheets ☒	N/A ☐	Previous SWQMP Submittals (see inside cover) ☐	Existing Site and Drainage Description ☒

2. *Indicate each compliance strategy below that will be used for one or more DMAs on the site.*

	Att. 6 DMAs without Structural BMPs	Att. 7 DMAs w/ Structural Pollutant Control BMPs	Att. 8 DMAs w/ Structural Hydromod. BMPs	Att. 9 Critical Coarse Sediment Yield Areas	Att. 10 BMP Installation Verification Form	Att. 11 Maintenance Agreements/ Plans	Att. 12 Alternative Compliance Projects
☒Self-mitigating DMAs (BMPDM Section 5.2.1)	☒			☒			
☐De Minimis DMAs (BMPDM Section 5.2.2)	☐			☐			
☐Self-retaining DMAs (BMPDM Section 5.2.3)	☐			☐	☐		
Structural BMPs (select all that apply)							
☒Pollutant Control BMPs (BMPDM Section 5.4)		☒		☒	☒	☒	
☒Hydromodification Control BMPs (BMPDM Chapter 6)			☒	☒	☒	☒	
☐Alternative Compliance Project (BMPDM Section 1.8)				☐	☐	☐	☐

☒ **Please check this box after you complete this list. Corresponding attachments will be automatically selected on the right.**

- *Attachments 1, 2, and 5 are required for all projects.*

Table 5: Critical Coarse Sediment Yield Area (CCSYA) Requirements

- Identify one applicable compliance pathway for the PDP below.
- Document your selection in **Attachment 9**.

A. Hydromodification Management Exemption (BMPDM Sections 1.6 and 6.1)

☐ **PDP is Exempt from Hydromodification Management Requirements**

Select if hydromodification management exemption was selected in Table 4 Part A.1.

B. Watershed Management Area (WMAA) Mapping (BMPDM Appendix H.1.1.2)

☒ **WMAA mapping demonstrates the following:**

a. <5% of potential onsite CCYSAs will be impacted (built on or obstructed)

b. All potential upstream offsite CCYSAs will be bypassed

C. Resource Protection Ordinance (RPO) Methods (BMPDM Appendix H.1.1.1)

☒ **RPO Scenario 1: PDP is subject to and in compliance with RPO requirements**

a. Project requires one or more discretionary permits (RPO applicability is confirmed during discretionary review)

b. Onsite AND upstream offsite CCSYAs will be avoided and/or bypassed

☐ **RPO Scenario 2: PDP is entirely exempt/not subject to RPO requirements**[6]

a. Project does not require discretionary permits

b. Project will bypass all upstream offsite CCSYAs (no requirements for onsite CCSYAs)

D. No Net Impact Analysis (BMPDM Appendix H.4)

☒ **Project demonstrates no net impact to receiving waters**

[6] Does not include PDPs utilizing exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3).

Table 6 –Minimum Construction Stormwater BMPs

Minimum Required BMPs by Activity Type Select all applicable activities and at least one BMP for each.	References Caltrans[7]	 County of San Diego
☐ **Erosion Control for Disturbed Slopes** (choose at least 1 per season)		
☐ Vegetation Stabilization Planting[8] (Summer)	SS-2, SS-4	
☐ Hydraulic Stabilization Hydroseeding (Summer)	SS-4	
☐ Bonded Fiber Matrix or Stabilized Fiber Matrix[9] (Winter)	SS-3	
☐ Physical Stabilization Erosion Control Blanket (Winter)	SS-7	
☒ **Erosion control for disturbed flat areas (slope < 5%)**		
☒ County Standard Lot Perimeter Protection Detail	SC-2	PDS 659[10]
☒ Use of Item A erosion control measures on flat areas	SS-3, SS-4, SS-7	
☒ County Standard Desilting Basin (must treat all site runoff)	SC-2	PDS 660[11]
☒ Mulch, straw, wood chips, soil application	SS-6, SS-8	
☒ **Energy dissipation (required to control velocity for concentrated runoff or dewatering discharge)**		
☒ Energy Dissipater Outlet Protection	SS-10	RSD D-40[12]
☒ **Sediment control for all disturbed areas**		
☒ Silt Fence	SC-1	
☒ Fiber Rolls (Straw Wattles)	SC-5	
☒ Gravel & Sand Bags	SC-6, SC-8	
☒ Dewatering Filtration	NS-2	
☒ Storm Drain Inlet Protection	SC-10	
☒ Engineered Desilting Basin (sized for 10-year flow)	SC-2	
☒ **Preventing offsite tracking of sediment**		
☒ Stabilized Construction Entrance	TC-1	
☒ Construction Road Stabilization	TC-2	
☒ Entrance/Exit Tire Wash	TC-3	
☒ Entrance/Exit Inspection & Cleaning Facility	TC-1	
☒ Street Sweeping and Vacuuming	SC-7	
☒ **Materials Management**		
☒ Material Delivery & Storage	WM-1	
☒ Spill Prevention and Control	WM-4	
☒ **Waste Management[13]**		
☒ Waste Management Concrete Waste Management	WM-8	
☒ Solid Waste Management	WM-5	
☒ Sanitary Waste Management	WM-9	
☒ Hazardous Waste Management	WM-6	

[7] See Caltrans 2017 Construction Site Best Management Practices (BMP) Manual available at: https://dot.ca.gov/programs/construction/storm-water-and-water-pollution-control/manuals-and-handbooks
[8] Planting or Hydroseeding may be installed between May 1st and August 15th. Slope irrigation must be in place and operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. A contingency physical BMP must be implemented by August 15th if vegetation is not established by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.
[9] All slopes over three feet must have established vegetative cover prior to final permit approval.
[10] County PDS 659. Standard Lot Perimeter Protection Design System (Bldg. Division)
[11] County PDS 660. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Bldg. Division
[12] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater (also acceptable for velocity reduction)
[13] Applicants are responsible to apply appropriate BMPs for specific wastes (e.g., BMP WM-8 for concrete).

Table 7 – Explanations and Justifications for Construction Phase BMPs

☒ **Check here if no explanations or justifications for Table 6 BMPs are required.**

Justifications for Table 6 Temporary Construction Phase BMPs

- **Required Justifications**: Justify all construction activity types for which NO BMPs were selected.
- **If Requested**: Justify why specific individual BMPs were not selected.
- **Additional Explanation**: Describe any proposed features and/or BMPs not listed in Table 6.

Activity Type / BMP		Explanation
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	
Activity Type	Activity Type	Explanation
BMP	BMP	

County of San Diego
Stormwater Quality Management Plan (SWQMP)
Attachment 1: Storm Water Intake Form for All Permit Applications

This form establishes Stormwater Quality Management Plan (SWQMP) requirements for Development Projects per Sections 67.809 and 67.811 of the County of San Diego Watershed Protection Ordinance (WPO). See ***Storm Water Intake Form Instructions*** for additional guidance and explanation of terms.

Part 1. Project Information	
Project Name:	Valley View Bonita
Record ID (Permit) No(s):	TBD
Assessor's Parcel No(s):	591-100-27 & 31
Street Address (or Intersection):	3410 Valley Rd
City, State, Zip:	Bonita, California, 91902

Part 2. Applicant / Project Proponent Information	
Name:	Arturo Valdez
Company:	Valley View Development, LLC.
Street Address:	2577 University Ave.
City, State, Zip:	San Diego, CA, 92104
Phone Number	619-942-1915
Email:	N/A

Part 3. Required Information for All Development Projects

Ⓐ	**1. Existing (pre-development) impervious surfaces (ft²)**	**2. Created or replaced impervious surfaces (ft²)**	**3. Total disturbed area (acres or ft²)**
	3020	43,485	81,643

Ⓑ	☒ Check here and provide a WDID# if this project is subject to the California Construction General Permit (Order No. 2009-0009-DWQ)[1]	**WDID # (if issued)**
		TBD

For County Use Only	Reviewed By:	Review Date:
☐ Standard SWQMP	☐ PDP SWQMP	☐ Green Streets PDP Exemption SWQMP

[1] Available at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html

Part 4. Priority Classification & SWQMP Form Selection

Ⓐ *If your project is the following … (select one)*	Ⓑ *You must complete …*
☐ **Standard Project** ☐ a. Project is East of the Pacific/Salton Sea Divide ☐ b. None of the PDP criteria below applies	➔ **Standard *SWQMP Form***
☒ **Priority Development Project (PDP)** ☐ 1. Project is part of an existing PDP**,** OR ☒ 2. Project does any of the following: ☒ a. Creates or replaces a total of 10,000 ft² or more of impervious surface ☐ b. Creates or replaces a combined total of 5,000 ft² or more of impervious surface within one or more of the following uses: (1) parking lots; (2) streets, roads, highways, freeways, and/or driveways; (3) restaurants; and (4) hillsides ☐ c. Creates or replaces a combined total of 5,000 ft² or more of impervious surface within one or more of the following uses: (1) automotive repair shops; and (2) retail gasoline outlets ☐ d. Discharges directly to an Environmentally Sensitive Area (ESA) AND creates or replaces 2,500 ft² or more of impervious surface ☒ e. Disturbs one or more acres of land (43,560 ft²) and is expected to generate pollutants post-construction ☐ f. Is a redevelopment project that creates or replaces 5,000 ft² or more of impervious surface on a site already having at least 10,000 ft² of impervious surface	➔ **PDP *SWQMP Form***
☐ **Green Streets PDP Exemption[2]**	➔ **Green *Streets PDP Exemption SWQMP Form***

Part 5. Applicant Signature

I have reviewed the information in this form, and it is true and correct to the best of my knowledge.

Applicant / Project Proponent Signature: Date: 10/17/22

- ***Upon completion*** *submit this form to the County.*
- ***If requested****, attach supporting documentation to justify selections made or exemptions claimed.*
- ***If this is a PDP that is part of a larger existing PDP****, you will be required to attach a copy of the existing SWQMP to the newer SWQMP submittal.*

[2] ***Green Streets PDP Exemption Projects*** are those claiming exemption from PDP classification per WPO Section 67.811(b)(2) because they consist exclusively of *either* 1) development of new sidewalks, bike lanes, and/or trails; *or* 2) improvements to existing roads, sidewalks, bike lanes, and/or trails.

2.0 General Requirements

- Attachment 2 consolidates exhibits and plans required for the entire project.
- Complete the table below to indicate which sub-attachments are included with the submittal. Sub-attachments that are not applicable can be excluded from the submittal.
- Unless otherwise stated, features and BMPs identified and described in each corresponding Attachment (6 through 9) must be shown on applicable DMA Exhibits and construction plans submitted for the project.

Sub-attachments	Requirement
☒ **2.1: DMA Exhibits**	All PDPs
☒ **2.2: Individual Structural BMP DMA Mapbook**	PDPs with structural BMPs
☒ **2.3: Construction Plan Sets**	All projects

2.1 DMA Exhibits

- DMA Exhibits must show all DMAs on the project site. Exhibits must include all applicable features identified in applicable SWQMP attachments.
- Exhibits may be prepared individually for the BMPs associated with each applicable SWQMP Attachment (6, 7, 8, and/or 9) or combined into one or more consolidated exhibits.
- Use this checklist to ensure required information is included on each exhibit (copy as needed).

DMA Exhibit ID #:	
A. Features required for all exhibits	
1. Existing Site Features	
☒ Underlying hydrologic soil group (A, B, C, D)	☒ Topography and impervious areas
☒ Approximate depth to groundwater	☒ Existing drainage network, directions, and offsite connections
☒ Natural hydrologic features	
2. Drainage Management Area (DMA) Information	
☒ Proposed drainage network, directions, and offsite connections	☒ DMA boundaries, ID numbers, areas, and type (structural BMP, de minimis, etc.)
3. Proposed Site Changes, Features, and BMPs	
☒ Proposed demolition and grading	☐ Construction BMPs[2]
☒ Group 1, 2, and 3 Features[1]	☒ Baseline source control BMPs
☒ Group 4 Features	☒ Baseline source control BMPs
B. Proposed Features and BMPs Specific to Individual SWQMP Attachments[3]	
☐ Attachment 6	☐ SSD-BMP impervious dispersion areas ☐ SSD-BMP tree wells
☒ Attachment 7	☒ Structural pollutant control BMPs
☒ Attachment 8	☒ Structural hydromodification management BMPs ☒ Point(s) of Compliance (POC) for hydromodification management ☒ Proposed drainage boundary and drainage area to each POC
☒ Attachment 9	☐ Onsite CCSYAs ☐ Bypass of onsite CCSYAs ☒ Bypass of upstream offsite CCSYAs

[1] Group 1-4 features and baseline BMPs from PDP SWQMP Tables 2 and 3.
[2] Minimum Construction Stormwater BMPs from PDP SWQMP Table 7.
[3] Identify the location, ID numbers, type, and size/detail of BMPs.

20 10 0 20 40 60

SCALE: 1" = 20'

DMA-2
3,452 SF

DMA-1
77,535 SF

DMA-3
25,796 SF

PAD=84.0 | PAD=83.0 | PAD=82.6 | PAD=82.0 | PAD=81.4

PAD=84.0 | PAD=83.4 | PAD=82.9 | PAD=82.3 | PAD=81.6

FG 82.0 FL 80.5 | FG 81.0 FL 79.8 | FG 80.0 FL 79.0 | FG 80.0 FL 78.0 | FG 77.0 FL 77.0

FG 82.9 FL 81.0 | FG 83.0 FL 81.5 | FG 83.2 FL 82.2

TW 81.5 FG 77.6 | TW 81.5 FG 79.0 | TW 81.5 FG 79.4 | TW 79.5 FG 79.3

TW 84.5 FG 84.0 FL 83.5 | TW 84.0 FG 84.0 | TW 92.5 FG 84.0 FL 91.5 | TW 93.0 FG 84.0 FL 92.0 | TW 90.0 FG 84.0 FL 89.0

TW 94.0 FG 84.0 | TW 93.5 FG 83.4 | TW 89.6 FG 83.4 | TW 84.8 FG 82.9 | TW 82.5 (82.5) | TW 82.5 FG 80.5 | TW 81.6 FG 78.4 | TW 78.5 FG 78.4

P 81.54 | P 82.94 | P 92.78 | P 93.50

VC. 81.16 FL 80.66 | VC. 79.63 FL 79.18 | VC. 79.44 FL 78.94

VC. 79.25 FL 78.75 VF 74.04 | VC. 78.31 FL 78.12

TC 79.40 FL 78.90 | TC 79.10 FL 78.60 | TC 78.10 FL 78.60

BMP-1 BIO-FILTRATION FL 78.82 FL 78.32

FG 76.0 | FL 76.00 | 24"X24" CB TG 77.00 FL 72.00 | FG 78.0 | FL 70.8± | FL 72.8± 55'2"

FG 78.2 | 4'-4' CO RIM=78.XX FL 71.10 24" RCP | FL 73.1± PER DWG 6844-D-A | FL 71.00

POC-1

PLAZA BONITA CENTER WAY

EX. 8" PVC WTR PER DWG A2670

18" RCP PER DWG 7329-D

EX. 8" PVC SWR PER DWG 7329-D

8" PVC SWR PER DWG 6081-D

3.5'X8' BOX CULVERT PER DWG 6844-D-A

IE 74.4 ± | IE 73.1 ± | IE 72.8 ± | IE 71.3 ±

18" RCP | 24" RCP

1.0% | 2% | 7% | 14.5% | 8.3% | (8.8)% | 2.0%

R=50' | R=30' | R=20'

N17°48'32"W | N72°48'32"E | N17°11'28"W

LEGEND

DMA AREAS

PROPERTY LINE

IMPERVIOUS AREA

PERVIOUS AREA SOIL

SOURCE CONTROL BMPS

SC-4.2.1 PREVENT ILLICIT DISCHARGES INTO THE MS4

SC-4.2.2 IDENTIFY STORM DRAIN USING STENCILING OR SIGNAGE

SITE DESIGN BMPS

SD-G CONSERVE NATURAL FEATURES

NO DUMPING DRAINS TO WATERWAYS

SAMPLE PROHIBITIVE SIGNAGE

NTS

PROPOSED CONDITIONS

DMA	SOIL TYPE	IMPERVIOUS (SF)	PERVIOUS (SF)	TOTAL AREA	DRAINS TO	BMP TYPE	POC
DMA-1	D	43,485	34,050	77,535	BMP-1	BIO-FILTRATION BASIN	POC-1
DMA-2	D	0	3,452	3,452	POC-1		POC-1
DMA-3	D	0	25,796	25,796	POC-1		POC-1
TOTAL	-	43,485	63,298	106,783	-		

SITE FEATURES:

HYDROLOGIC SOIL CLASS: C
APPROX. DEPTH TO GROUNDWATER: 20FT

NO.	DESCRIPTION	REVISIONS DATE	APP'D

Civil Engineering • Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax
R·E·C Consultants, Inc.

DATE: 12-14-2021
SCALE: 1" = 40'
DRAWN: E.R.F.
CHECKED: W.O.G.

SHEET TITLE: PROP. COND. DMA & HMP EXHIBIT

PROJECT: VALLEY VIEW
PLAZA BONITA CENTERWAY
BONITA, CA

SHEET 1 OF 1 SHEETS

SAVE DATE: 4/25/2023 ~ PLOT DATE: 4/25/2023 ~ FILE NAME: C:\Users\dsivd\Desktop\Bonita\Exhibits\DMA_Exhibit_Post.dwg

2.2 Individual Structural BMP DMA Mapbook

- Use this page as a cover sheet for the Structural DMA Mapbook.
- An individual Structural DMA Mapbook must be submitted for any project site with one or more structural BMPs. One Mapbook is required for each unique subsequent owner with responsibility for maintenance of a Structural BMP. Mapbook exhibits will be incorporated as exhibits in Stormwater Maintenance Agreements (SWMAs) and Maintenance Notifications (MNs). See Attachment 11 for additional information on maintenance agreements. If the Mapbook has been provided for each subsequent owner in Attachment 11, they are not required here.
- Place each map on 8.5"x11" paper.
- Show at a minimum the DMA, Structural BMP, Assessor's parcel boundaries with parcel numbers, and any existing hydrologic features within the DMA.

☐	All Mapbooks are attached
☐	All Mapbooks are in Attachment 11

2.3 Construction Plan Sets

- DMAs, features, and BMPs identified and described in this attachment must also be shown on all applicable construction and landscape plans.
- As applicable, plan sheets must identify:
    - All features and BMPs identified in Sub-attachment 2.1 (DMA Exhibits).
    - The additional information listed below.
- Use this checklist to ensure required information is included on each plan (copy as needed).

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

[4] For Building Permit Applications, refer to Form PDS 272, https://www.sandiegocounty.gov/content/dam/sdc/pds/docs/pds272.pdf

5.0 General Requirements

- Each Priority Development Project (PDP) must provide a description of existing site conditions and proposed changes to them, including changes to topography and drainage.
- Has a **Drainage Report** has been prepared for the PDP?

  ☒ **Yes**

  - Review of the Drainage Report must be concurrent with the PDP SWQMP.
  - Include the summary page of the Drainage Report with this cover page, and provide the following information:

    Title: TM Drainage Study for Valley View Development

    Prepared By: REC Consultants, Inc.

    Date: April, 2023

  - Do not complete the rest of this attachment (also exclude these additional pages from your submittal). Additional documentation of site and drainage conditions is not required unless requested by County staff.

  ☐ **No** -- Complete and submit the remainder of this attachment below.

TM DRAINAGE STUDY

For

VALLEY VIEW DEVELOPMENT

Prepared for**:**

Alidade Engineering

Prepared by:

Dr. Luis Parra
REC Consultants, Inc
27349 Jefferson Ave, Suite 112
Temecula, CA 92590
Telephone: 951-693-2400

Report Prepared:

October 12, 2022

REVISED April 30, 2023

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CHAPTER 1 - EXECUTIVE SUMMARY

1.1 – Introduction

The Valley View residential project site is located to the north east of the intersection of Plaza Bonita Centerway & Sweetwater Road in the County of San Diego, California.

Runoff from the site drains to a single point of discharge from the project site, the existing natural creek located adjacent to the southern boundary of the site.

This study analyzes existing and developed condition 100-year peak flowrates from the development to the existing point of discharge.

The project site lies outside any FEMA 100-year floodplain zones. Therefore, no Letters of Map Revision will be required.

Treatment of storm water runoff from the site has been addressed in a separate report - the “Storm Water Quality Management Plan for Valley View”, dated October 2022 by REC.

Per County of San Diego drainage criteria, the Modified Rational Method should be used to determine peak design flowrates when the contributing drainage area is less than 1.0 square mile. Since the total watershed area discharging from the site is less than 1.0 square mile, AES computer software was used to model the pre & post developed condition runoff response per the Modified Rational Method.

Methodology used for the computation of design rainfall events, hydrographs, runoff coefficients, and rainfall intensity values are consistent with criteria set forth in the “County of San Diego Drainage Design Manual”. A more detailed explanation of methodology used for this analysis is listed in Chapter 2 of this report.

Hydraulic Modified-Puls detention basin routing of the aforementioned modified rational method hydrology was performed using the Army Corps of Engineers HEC-HMS software. Hydrographs were generated using the RatHydro program developed by Rick Engineering Company.

1.2 – Summary of Existing Conditions

In existing conditions, the Valley View project site is a developed residential lot featuring a single residential structure and sparse light vegetation. Runoff from the site drains to a single point of discharge from the project site, the existing natural creek located adjacent to the southern boundary of the site prior to being intercepted by an existing culvert located beneath Plaza Bonita Centerway.

Per County of San Diego rainfall isopluvial maps, the design 100-year rainfall depth for the project site is 2.7 inches. The project site comprises of hydrologic soil classes C and D soils such that runoff coefficients of 0.36 and 0.41 were used for the existing residence. A weighted runoff coefficient was calculated for the combined soil class, with a resultant C of 0.364 (see chapter 2 for calculations). Table 1 summarizes the existing condition design 100-year peak flow from the project site.

Table 1 – SUMMARY OF EXISTING CONDITIONS FLOWS

Discharge Location	Drainage Area (Ac)	Runoff Coefficient (C)	100-Year Peak Flow (cfs)
Existing Creek	2.5	0.36	4.12

1.3 – Summary of Developed Conditions

The Valley View project proposes the construction of multiple single family residences, inclusive of a servicing drive and associated landscaping. Runoff from the project is drained to one (1) receiving dual purpose water quality and HMP BMP located to the southern boundary of the project site adjacent to the existing creek. Peak flows are then drained from the BMP facility to the existing culvert.

Per County of San Diego rainfall isopluvial maps, the design 100-year rainfall depth for the project site is 2.7 inches. The project site comprises of hydrologic soil class C and D soils such that runoff coefficients of 0.54 and 0.57 were used for the proposed residential areas. A weighted runoff coefficient was calculated for the combined soil class, with a resultant C of 0.54 (see chapter 2 for calculations). Table 2 summarizes the developed condition design 100-year peak flow from the project site.

Table 2 – SUMMARY OF DEVELOPED CONDITIONS FLOWS

Discharge Location	Drainage Area (Ac)	Runoff Coefficient (C)	100-Year Peak Flow (cfs)
Existing Creek	2.5	0.54	5.24

Prior to discharging from the project site, first flush runoff will be treated via an onsite bio-filtration BMP in accordance with standards set forth by the Regional Water Quality Control Board and the County of San Diego's BMP Design Manual (see "Storm Water Quality Management Plan for Valley View").

Peak developed flows from the project site are conveyed to one (1) onsite detention facility prior to discharging to the adjacent creek. The basin is approximately 2-feet deep with a single riser box outlet structure that incorporates three (3) 12-inch by 3-inch slotted orifices that are built into the sides of the of the riser box. The slots are to be

located 1-foot above the invert of the detention basin surface invert and the riser box will be constructed to a top elevation of 1.7-feet above the basin surface invert to act as an emergency spillway.

The developed condition peak flows calculated using modified rational method was then routed through the detention facility on the project site in HEC-HMS. The HMS Modified-Puls results are summarized in Table 5. For this analysis it is assumed the 9-inch gravel layer and the first 2-inches of chamber volume is for water quality purposes only and have not been accounted for in the peak flow analysis, only the volume above this elevation within the underground vault has been analyzed.

TABLE 3 – SUMMARY OF DETENTION BASIN ROUTING

Detention Basin	100-Year Peak Inflow (cfs)	100-Year Peak Outflow (cfs)	Peak Water Surface Elevation (ft)
DET BASIN	4.08	2.23	1.504

Input hydrographs for the HMS analysis were generated using the RatHydro program developed by Rick Engineering Company and are provided Chapter 3 of this report.

Rational method hydrographs, stage-storage, stage-discharge relationships and HEC-HMS model output is provided in Chapter 3 of this report.

1.4 – Summary of Results

Table 4 summarizes developed and existing condition drainage areas and resultant 100-year peak flow rates at the receiving discharge location from the Valley View Development site. Per County of San Diego rainfall isopluvial maps, the design 100-year rainfall depth for the site area is 2.7inches.

Table 4 – SUMMARY OF PEAK FLOWS

Discharge Location	Area (ac)			100 Year Peak Flow (cfs)		
	Existing	Developed	Difference	Existing	Developed	Difference
Existing Creek	2.5	2.5	0.00	4.12	2.99	-1.13

As illustrated in Table 4, the proposed Valley View project site will decrease peak flows when compared to the existing condition. The total net decrease in flow from the pre-developed condition is approximately 1.13 cfs, thus the project has no net impact to the receiving watershed. All developed runoff will receive water quality treatment in accordance with the site specific SWQMP.

Final design details will be provided at the final engineering phase of the development.

1.5 – Conclusions

This report has been prepared in accordance with the County of San Diego Hydrology Manual. This report has evaluated and addressed the potential impacts and proposed mitigation measures. A summary of the facts and findings associated with this project and the measures addressed by this report is as follows:

- The project will not alter drainage patterns on the site or increase runoff after development.
- The ultimate discharge points will not be changed.
- Graded areas and slopes will be hydroseeded to reduce or eliminate sediment discharge.
- Identify and discuss, with appropriate backup/research information, the following question item by item for CEQA purposes. Would the project:

A. Substantially alter the existing drainage patterns of the site or area, including through the alteration if the course of a stream or river, in a manner which would result in substantial erosion or siltation on – or off-site?

The project does not substantially alter the existing drainage pattern of the area and does not alter the course of a stream or river.

The storm drain system for the entire project is designed to route and convey all resulting runoff from developed conditions to existing point of discharge.

B. Substantially alter the existing drainage patterns of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The project will not substantially alter the existing drainage pattern of the area as it will not alter the course of a stream or river, and also will not substantially increase the rate or amount of surface runoff in a manner which would result in on- or off-site flooding.

C. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems?

No. The project drain directly to the receiving natural waterway and does not increase flows to existing storm water drainage systems.

D. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood insurance Rate Map or other flood hazard delineation map, including County Floodplain Maps? For example; research the foregoing and provide same (to indicate applicability or not) in the study?

The project does not place any structure within a 100-year flood hazard area.

E. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

There are no structures proposed within a 100-year flood hazard area.

F. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam on-sit or off-site?

NA

1.6 – References

"*County of San Diego Hydrology Manual*", June 2003

"*San Diego County Hydraulic Design Manual*", September 2014

"*Stormwater Quality Management Plan for Valley View Development*", April 2023, REC Consultants.

1.7 – Declaration of Responsible Charge

THIS PRELIMINARY DRAINAGE STUDY HAS BEEN PREPARED UNDER THE DIRECTION OF THE FOLLOWING REGISTERED CIVIL ENGINEER. THE REGISTERED ENGINEER ATTESTS TO THE TECHNICAL INFORMATION CONTAINED HEREIN AND THE ENGINEERING DATA UPON WHICH RECOMMENDATIONS, CONCLUSIONS, AND DECISIONS ARE BASED.



Luis A. Parra-Rosales R.C.E. 66377

CHAPTER 2 - METHODOLOGY

2.1 – County of San Diego Design Criteria

SECTION 3
RATIONAL METHOD AND MODIFIED RATIONAL METHOD

3.1 THE RATIONAL METHOD

The Rational Method (RM) is a mathematical formula used to determine the maximum runoff rate from a given rainfall. It has particular application in urban storm drainage, where it is used to estimate peak runoff rates from small urban and rural watersheds for the design of storm drains and small drainage structures. The RM is recommended for analyzing the runoff response from drainage areas up to approximately 1 square mile in size. It should not be used in instances where there is a junction of independent drainage systems or for drainage areas greater than approximately 1 square mile in size. In these instances, the Modified Rational Method (MRM) should be used for junctions of independent drainage systems in watersheds up to approximately 1 square mile in size (see Section 3.4); or the NRCS Hydrologic Method should be used for watersheds greater than approximately 1 square mile in size (see Section 4).

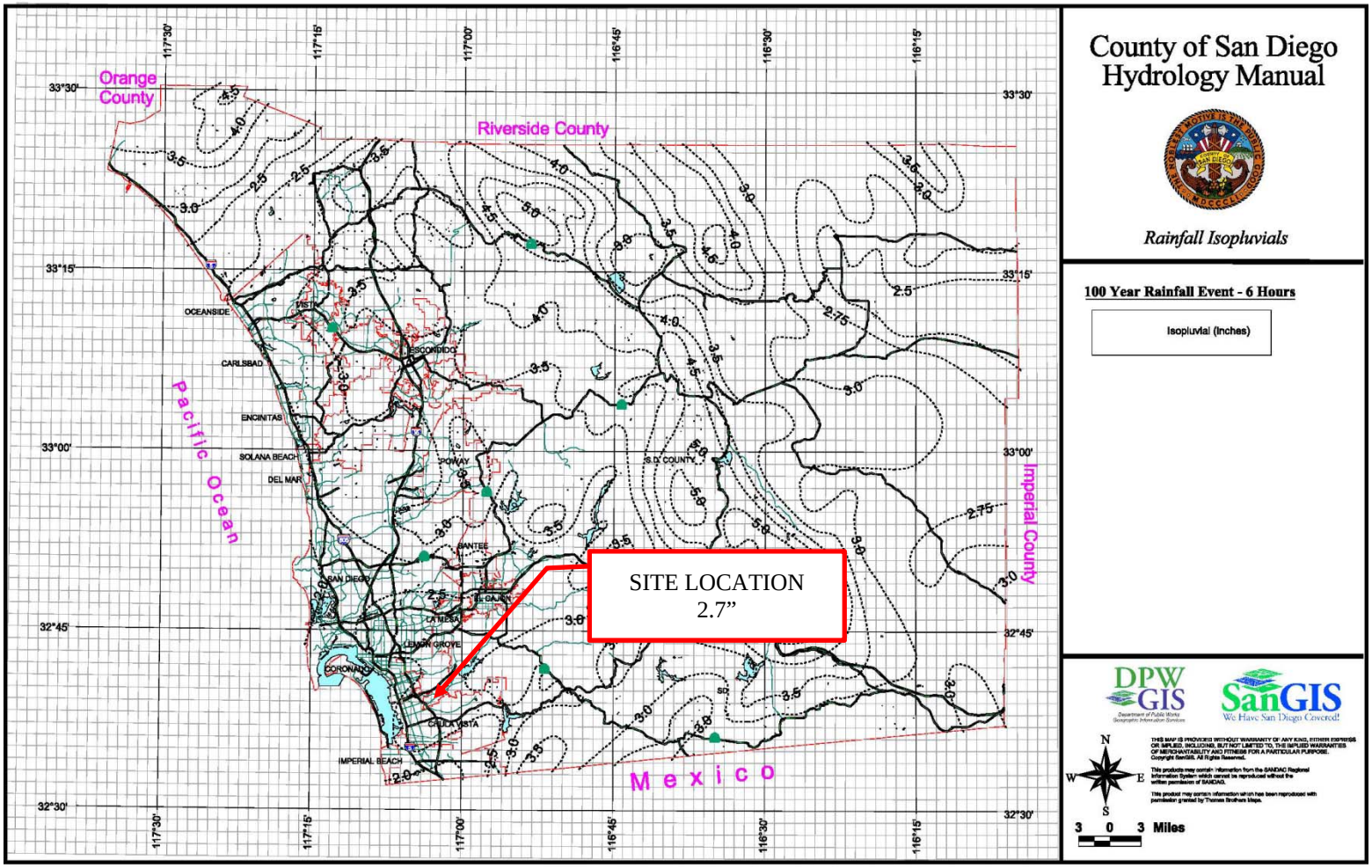
The RM can be applied using any design storm frequency (e.g., 100-year, 50-year, 10-year, etc.). The local agency determines the design storm frequency that must be used based on the type of project and specific local requirements. A discussion of design storm frequency is provided in Section 2.3 of this manual. A procedure has been developed that converts the 6-hour and 24-hour precipitation isopluvial map data to an Intensity-Duration curve that can be used for the rainfall intensity in the RM formula as shown in Figure 3-1. The RM is applicable to a 6-hour storm duration because the procedure uses Intensity-Duration Design Charts that are based on a 6-hour storm duration.

3.1.1 Rational Method Formula

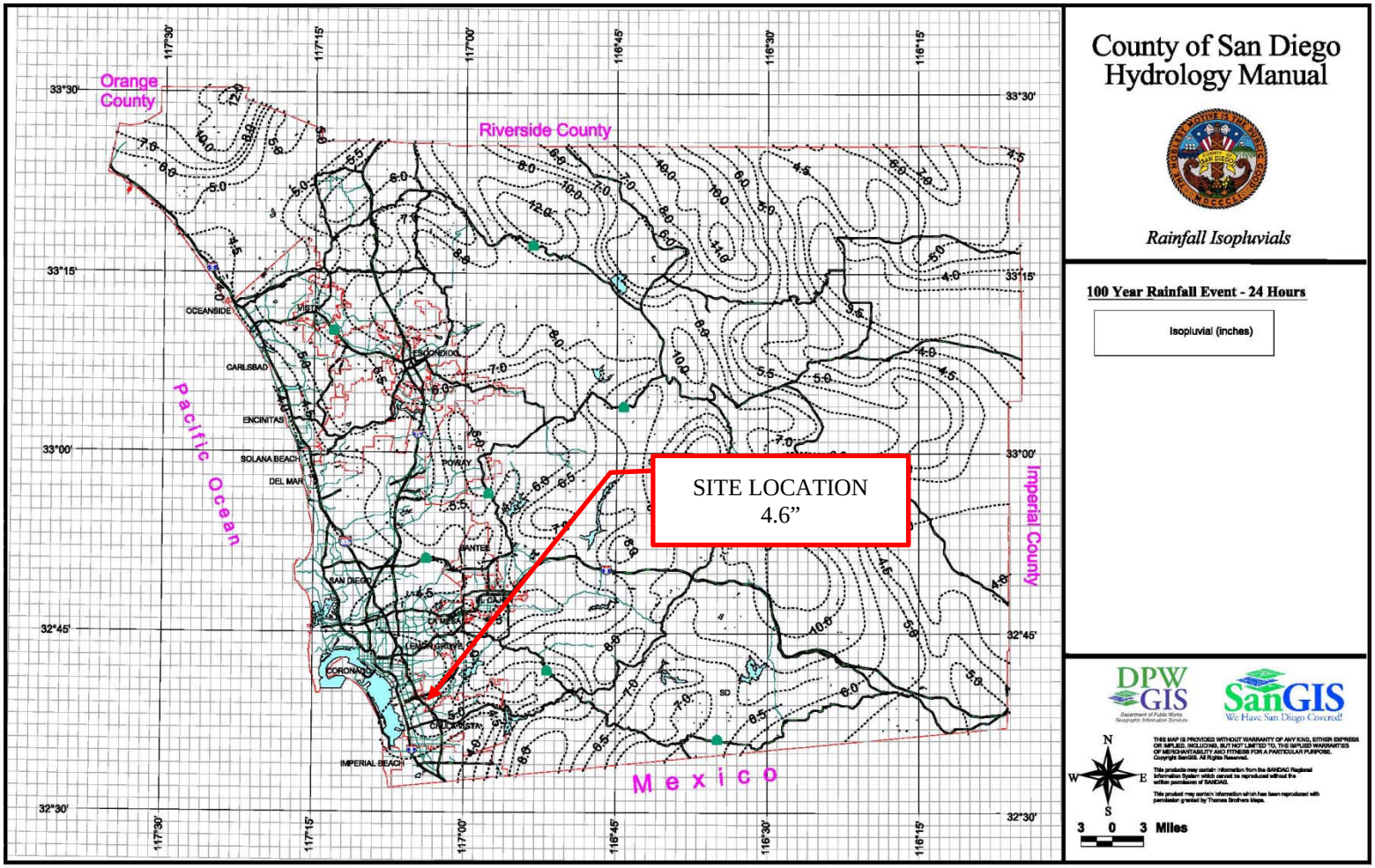
The RM formula estimates the peak rate of runoff at any location in a watershed as a function of the drainage area (A), runoff coefficient (C), and rainfall intensity (I) for a duration equal to the time of concentration (T_c), which is the time required for water to

2.2 – Design Rainfall Determination

2.2.1 – 100-Year, 6-Hour Rainfall Isopluvial Map



2.2.2 – 100-Year, 24-Hour Rainfall Isopluvial Map



2.3 – Runoff Coefficient Determination

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

- The storm frequency of peak discharges is the same as that of I for the given T_c.

- The fraction of rainfall that becomes runoff (or the runoff coefficient, C) is independent of I or precipitation zone number (PZN) condition (PZN Condition is discussed in Section 4.1.2.4).

- The peak rate of runoff is the only information produced by using the RM.

3.1.2 Runoff Coefficient

Table 3-1 lists the estimated runoff coefficients for urban areas. The concepts related to the runoff coefficient were evaluated in a report entitled *Evaluation, Rational Method "C" Values* (Hill, 2002) that was reviewed by the Hydrology Manual Committee. The Report is available at San Diego County Department of Public Works, Flood Control Section and on the San Diego County Department of Public Works web page.

The runoff coefficients are based on land use and soil type. Soil type can be determined from the soil type map provided in Appendix A. An appropriate runoff coefficient (C) for each type of land use in the subarea should be selected from this table and multiplied by the percentage of the total area (A) included in that class. The sum of the products for all land uses is the weighted runoff coefficient ($\Sigma[CA]$). Good engineering judgment should be used when applying the values presented in Table 3-1, as adjustments to these values may be appropriate based on site-specific characteristics. In any event, the impervious percentage (% Impervious) as given in the table, for any area, shall govern the selected value for C. The runoff coefficient can also be calculated for an area based on soil type and impervious percentage using the following formula:

$$C = 0.90 \times (\% \text{ Impervious}) + C_p \times (1 - \% \text{ Impervious})$$

Where: C_p = Pervious Coefficient Runoff Value for the soil type (shown in Table 3-1 as Undisturbed Natural Terrain/Permanent Open Space, 0% Impervious). Soil type can be determined from the soil type map provided in Appendix A.

The values in Table 3-1 are typical for most urban areas. However, if the basin contains rural or agricultural land use, parks, golf courses, or other types of nonurban land use that are expected to be permanent, the appropriate value should be selected based upon the soil and cover and approved by the local agency.

2.4 – Urban Watershed Overland Time of Flow Nomograph

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

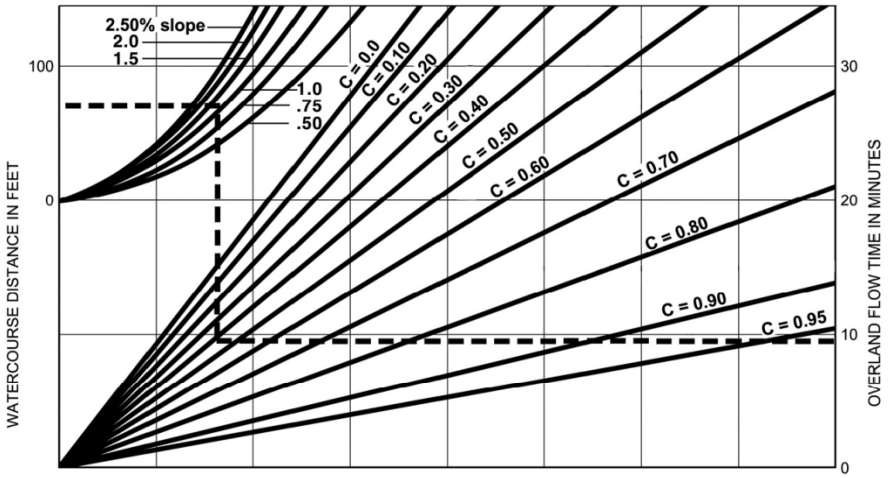
Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description



EXAMPLE:
Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

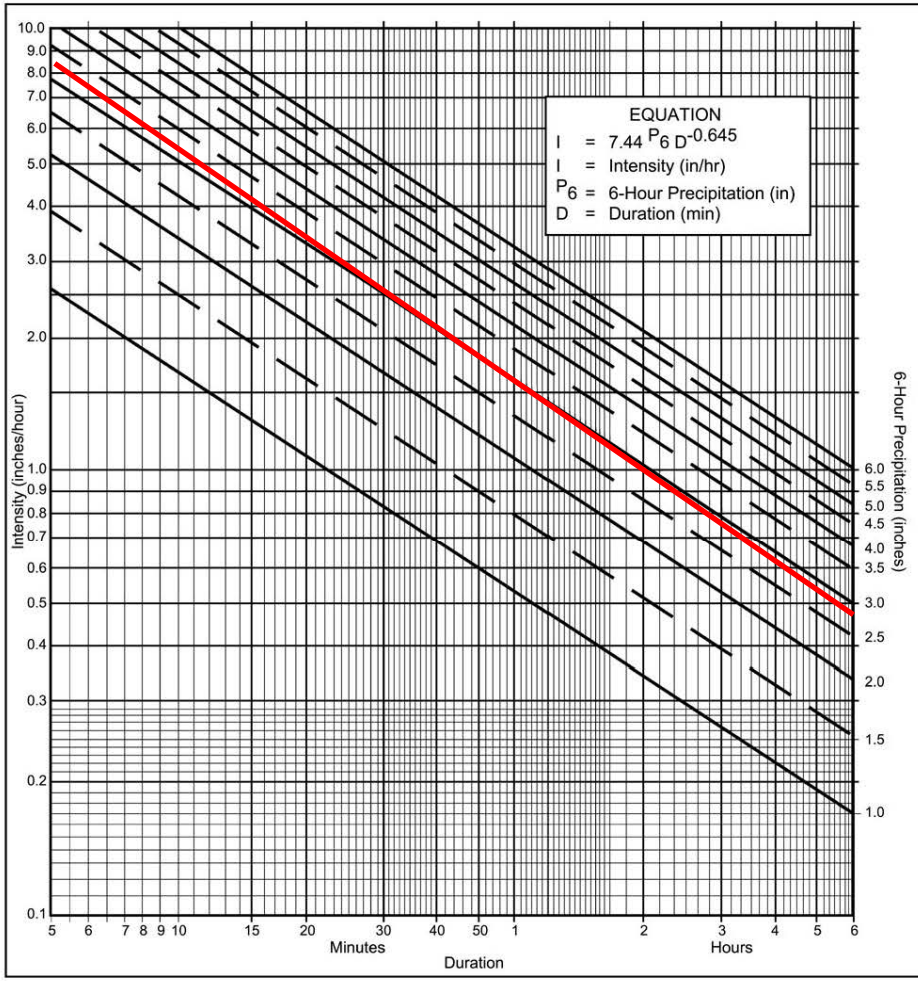
$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE
3-3

2.5 – County of San Diego Intensity- Duration Curve



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 2.7 in., P_{24} = 4.6, $\frac{P_6}{P_{24}}$ = 59 %(2)

(c) Adjusted P_6(2) = _____ in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

2.6 – Model Development Summary (from County of San Diego Hydrology Manual)

3.2 DEVELOPING INPUT DATA FOR THE RATIONAL METHOD

This section describes the development of the necessary data to perform RM calculations. Section 3.3 describes the RM calculation process. Input data for calculating peak flows and T_c's with the RM should be developed as follows:

1. On a topographic base map, outline the overall drainage area boundary, showing adjacent drains, existing and proposed drains, and overland flow paths.

2. Verify the accuracy of the drainage map in the field.

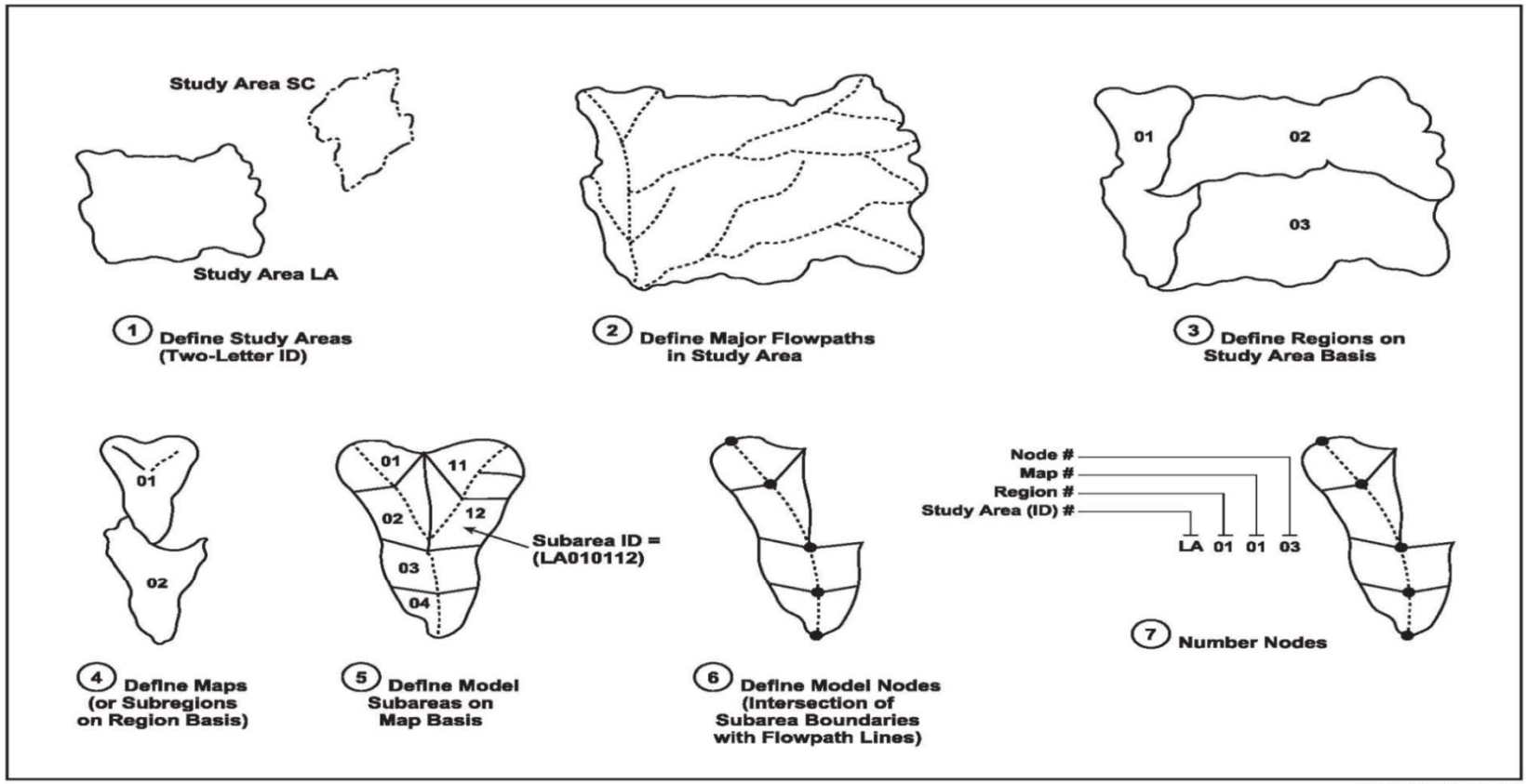
3. Divide the drainage area into subareas by locating significant points of interest. These divisions should be based on topography, soil type, and land use. Ensure that an appropriate first subarea is delineated. For natural areas, the first subarea flow path length should be less than or equal to 4,000 feet plus the overland flow length (Table 3-2). For developed areas, the initial subarea flow path length should be consistent with Table 3-2. The topography and slope within the initial subarea should be generally uniform.

4. Working from upstream to downstream, assign a number representing each subarea in the drainage system to each point of interest. Figure 3-8 provides guidelines for node numbers for geographic information system (GIS)-based studies.

5. Measure each subarea in the drainage area to determine its size in acres (A).

6. Determine the length and effective slope of the flow path in each subarea.

7. Identify the soil type for each subarea.



GIS/Hydrologic Model
Data Base Linkage Setup:
Nodes, Subareas, Links

FIGURE
3-8

8. Determine the runoff coefficient (C) for each subarea based on Table 3-1. If the subarea contains more than one type of development classification, use a proportionate average for C. In determining C for the subarea, use future land use taken from the applicable community plan, Multiple Species Conservation Plan, National Forest land use plan, etc.

9. Calculate the CA value for the subarea.

10. Calculate the Σ(CA) value(s) for the subareas upstream of the point(s) of interest.

11. Determine P_6 and P_{24} for the study using the isopluvial maps provided in Appendix B. If necessary, adjust the value for P_6 to be within 45% to 65% of the value for P_{24}.

See Section 3.3 for a description of the RM calculation process.

3.3 Performing Rational Method Calculations

This section describes the RM calculation process. Using the input data, calculation of peak flows and T_c's should be performed as follows:

1. Determine T_i for the first subarea. Use Table 3-2 or Figure 3-3 as discussed in Section 3.1.4. If the watershed is natural, the travel time to the downstream end of the first subarea can be added to T_i to obtain the T_c. Refer to paragraph 3.1.4.2 (a).

2. Determine I for the subarea using Figure 3-1. If T_i was less than 5 minutes, use the 5 minute time to determine intensity for calculating the flow.

3. Calculate the peak discharge flow rate for the subarea, where $Q_p = \Sigma(CA)\, I$.
In case that the downstream flow rate is less than the upstream flow rate, due to the long travel time that is not offset by the additional subarea runoff, use the upstream peak flow for design purposes until downstream flows increase again.

4. Estimate the T_t to the next point of interest.

5. Add the T_t to the previous T_c to obtain a new T_c.

6. Continue with step 2, above, until the final point of interest is reached.

Note: The MRM should be used to calculate the peak discharge when there is a junction from independent subareas into the drainage system.

3.4 MODIFIED RATIONAL METHOD (FOR JUNCTION ANALYSIS)

The purpose of this section is to describe the steps necessary to develop a hydrology report for a small watershed using the MRM. It is necessary to use the MRM if the watershed contains junctions of independent drainage systems. The process is based on the design manuals of the City/County of San Diego. The general process description for using this method, including an example of the application of this method, is described below.

The engineer should only use the MRM for drainage areas up to approximately 1 square mile in size. If the watershed will significantly exceed 1 square mile then the NRCS method described in Section 4 should be used. The engineer may choose to use either the RM or the MRM for calculations for up to an approximately 1-square-mile area and then transition the study to the NRCS method for additional downstream areas that exceed approximately 1 square mile. The transition process is described in Section 4.

3.4.1 Modified Rational Method General Process Description

The general process for the MRM differs from the RM only when a junction of independent drainage systems is reached. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction are calculated by the RM. The independent drainage systems are then combined using the MRM procedure described below. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction must be calculated prior to using the MRM procedure to combine the independent drainage systems, as these

values will be used for the MRM calculations. After the independent drainage systems have been combined, RM calculations are continued to the next point of interest.

3.4.2 Procedure for Combining Independent Drainage Systems at a Junction

Calculate the peak Q, T_c, and I for each of the independent drainage systems at the point of the junction. These values will be used for the MRM calculations.

At the junction of two or more independent drainage systems, the respective peak flows are combined to obtain the maximum flow out of the junction at T_c. Based on the approximation that total runoff increases directly in proportion to time, a general equation may be written to determine the maximum Q and its corresponding T_c using the peak Q, T_c, and I for each of the independent drainage systems at the point immediately before the junction. The general equation requires that contributing Q's be numbered in order of increasing T_c.

Let Q_1, T_1, and I_1 correspond to the tributary area with the shortest T_c. Likewise, let Q_2, T_2, and I_2 correspond to the tributary area with the next longer T_c; Q_3, T_3, and I_3 correspond to the tributary area with the next longer T_c; and so on. When only two independent drainage systems are combined, leave Q_3, T_3, and I_3 out of the equation. Combine the independent drainage systems using the junction equation below:

Junction Equation: $T_1 < T_2 < T_3$

$$Q_{T1} = Q_1 + \frac{T_1}{T_2} Q_2 + \frac{T_1}{T_3} Q_3$$

$$Q_{T2} = Q_2 + \frac{I_2}{I_1} Q_1 + \frac{T_2}{T_3} Q_3$$

$$Q_{T3} = Q_3 + \frac{I_3}{I_1} Q_1 + \frac{I_3}{I_2} Q_2$$

Calculate Q_{T1}, Q_{T2}, and Q_{T3}. Select the largest Q and use the T_c associated with that Q for further calculations (see the three Notes for options). If the largest calculated Q's are equal (e.g., $Q_{T1} = Q_{T2} > Q_{T3}$), use the shorter of the T_c's associated with that Q.

This equation may be expanded for a junction of more than three independent drainage systems using the same concept. The concept is that when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a shorter T_c (e.g., Q_1), the Q from the subarea with the shorter T_c is reduced by the ratio of the I's (I_2/I_1); and when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a longer T_c (e.g., Q_3), the Q from the subarea with the longer T_c is reduced by the ratio of the T_c's (T_2/T_3).

Note #1: At a junction of two independent drainage systems that have the same T_c, the tributary flows may be added to obtain the Q_p.

$$Q_p = Q_1 + Q_2 \text{; when } T_1 = T_2 \text{; and } T_c = T_1 = T_2$$

This can be verified by using the junction equation above. Let Q_3, T_3, and $I_3 = 0$. When T_1 and T_2 are the same, I_1 and I_2 are also the same, and T_1/T_2 and $I_2/I_1 = 1$. T_1/T_2 and I_2/I_1 are cancelled from the equations. At this point, $Q_{T1} = Q_{T2} = Q_1 + Q_2$.

Note #2: In the upstream part of a watershed, a conservative computation is acceptable. When the times of concentration (T_c's) are relatively close in magnitude (within 10%), use the shorter T_c for the intensity and the equation $Q = \Sigma(CA)I$.

Note #3: . An optional method of determining the T_c is to use the equation
$T_c = [(\Sigma (CA)7.44\ P_6)/Q]^{1.55}$

This equation is from $Q = \Sigma(CA)I = \Sigma(CA)(7.44\ P_6/T_c^{.645})$ and solving for T_c. The advantage in this option is that the T_c is consistent with the peak flow Q, and avoids inappropriate fluctuation in downstream flows in some cases.

CHAPTER 3 - HEC-HMS Modified-Puls Routing Analysis

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 8/4/2022
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 11 MIN.
6 HOUR RAINFALL 2.7 INCHES
BASIN AREA 1.8 ACRES
RUNOFF COEFFICIENT 0.54
PEAK DISCHARGE 4.08 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 11	DISCHARGE (CFS) = 0.2
TIME (MIN) = 22	DISCHARGE (CFS) = 0.2
TIME (MIN) = 33	DISCHARGE (CFS) = 0.2
TIME (MIN) = 44	DISCHARGE (CFS) = 0.2
TIME (MIN) = 55	DISCHARGE (CFS) = 0.2
TIME (MIN) = 66	DISCHARGE (CFS) = 0.2
TIME (MIN) = 77	DISCHARGE (CFS) = 0.2
TIME (MIN) = 88	DISCHARGE (CFS) = 0.2
TIME (MIN) = 99	DISCHARGE (CFS) = 0.2
TIME (MIN) = 110	DISCHARGE (CFS) = 0.2
TIME (MIN) = 121	DISCHARGE (CFS) = 0.2
TIME (MIN) = 132	DISCHARGE (CFS) = 0.2
TIME (MIN) = 143	DISCHARGE (CFS) = 0.3
TIME (MIN) = 154	DISCHARGE (CFS) = 0.3
TIME (MIN) = 165	DISCHARGE (CFS) = 0.3
TIME (MIN) = 176	DISCHARGE (CFS) = 0.3
TIME (MIN) = 187	DISCHARGE (CFS) = 0.4
TIME (MIN) = 198	DISCHARGE (CFS) = 0.4
TIME (MIN) = 209	DISCHARGE (CFS) = 0.5
TIME (MIN) = 220	DISCHARGE (CFS) = 0.6
TIME (MIN) = 231	DISCHARGE (CFS) = 0.8
TIME (MIN) = 242	DISCHARGE (CFS) = 1.2
TIME (MIN) = 253	DISCHARGE (CFS) = 4.08
TIME (MIN) = 264	DISCHARGE (CFS) = 0.7
TIME (MIN) = 275	DISCHARGE (CFS) = 0.4
TIME (MIN) = 286	DISCHARGE (CFS) = 0.3
TIME (MIN) = 297	DISCHARGE (CFS) = 0.3
TIME (MIN) = 308	DISCHARGE (CFS) = 0.3
TIME (MIN) = 319	DISCHARGE (CFS) = 0.2
TIME (MIN) = 330	DISCHARGE (CFS) = 0.2
TIME (MIN) = 341	DISCHARGE (CFS) = 0.2
TIME (MIN) = 352	DISCHARGE (CFS) = 0.2
TIME (MIN) = 363	DISCHARGE (CFS) = 0.2
TIME (MIN) = 374	DISCHARGE (CFS) = 0

Outlet structure for Discharge of Detention Basin 1

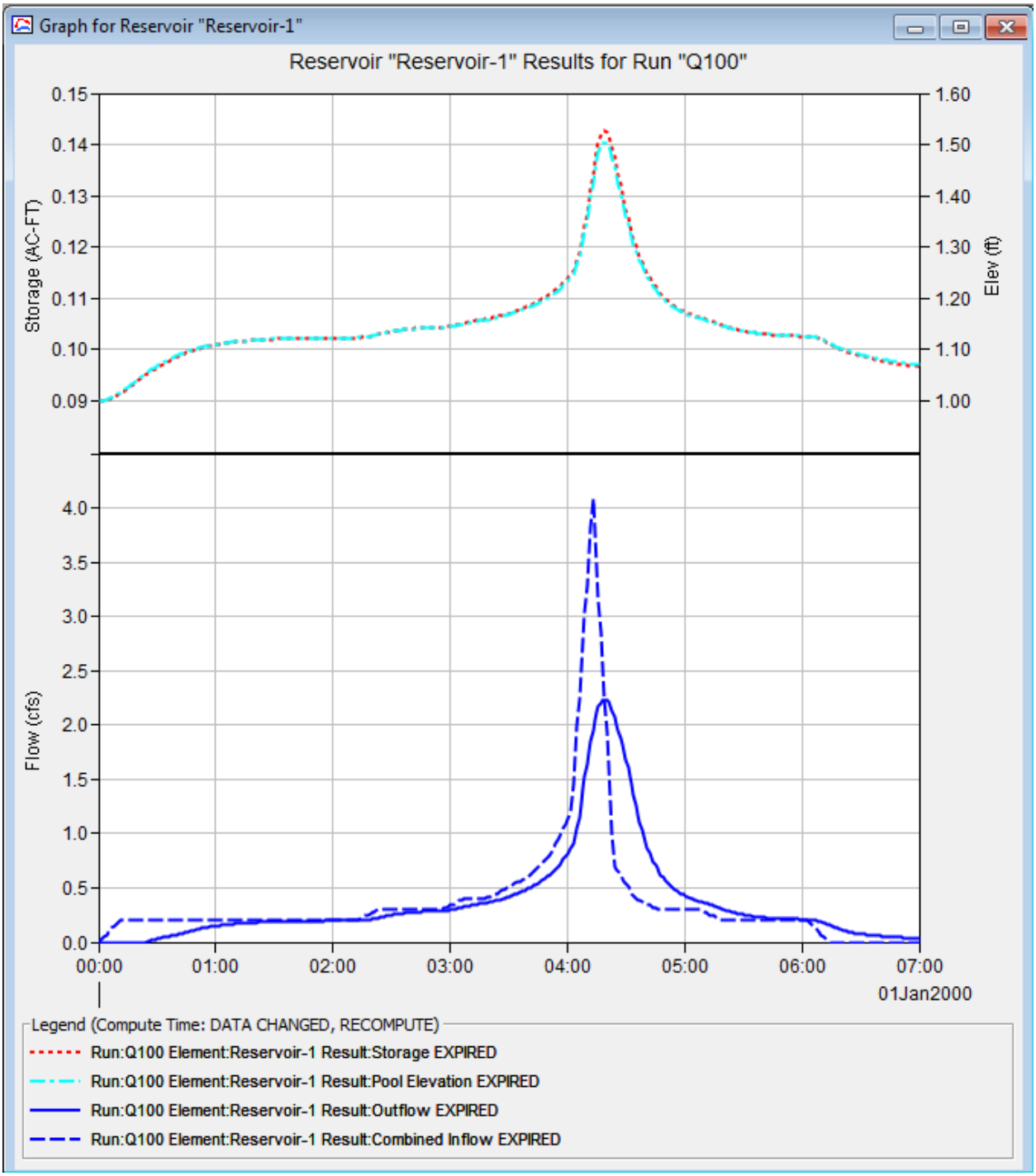
(note: 0.0 elev = 1 ft actual elevation)

Discharge vs Elevation Table

Low orifice:	1	"	Lower slot		
Number:	0		Invert:	0.00	ft
Cg-low:	0.62		B	3.00	ft
Middle orifice:	1	"	h	0.250	ft
number of orif:	0		Upper slot		
Cg-middle:	0.62		Invert:	0.000	ft
invert elev:	0.25	ft	B:	0.00	ft
			h	0.000	ft

Emergency Weir		
Invert:	0.700	ft
B:	8	ft

h (ft)	H/D-low -	H/D-mid -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qslot-low (cfs)	Qslot-upp (cfs)	Qemer (cfs)	Qtot (cfs)
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.042	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.000	0.000	0.079
0.083	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.224	0.000	0.000	0.224
0.125	1.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.411	0.000	0.000	0.411
0.167	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.633	0.000	0.000	0.633
0.208	2.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.884	0.000	0.000	0.884
0.250	3.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.163	0.000	0.000	1.163
0.292	3.500	0.500	0.000	0.000	0.000	0.000	0.000	0.000	1.465	0.000	0.000	1.465
0.333	4.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	1.676	0.000	0.000	1.676
0.375	4.500	1.500	0.000	0.000	0.000	0.000	0.000	0.000	1.836	0.000	0.000	1.836
0.417	5.000	2.000	0.000	0.000	0.000	0.000	0.000	0.000	1.983	0.000	0.000	1.983
0.458	5.500	2.500	0.000	0.000	0.000	0.000	0.000	0.000	2.120	0.000	0.000	2.120
0.500	6.000	3.000	0.000	0.000	0.000	0.000	0.000	0.000	2.248	0.000	0.000	2.248
0.542	6.500	3.500	0.000	0.000	0.000	0.000	0.000	0.000	2.370	0.000	0.000	2.370
0.583	7.000	4.000	0.000	0.000	0.000	0.000	0.000	0.000	2.486	0.000	0.000	2.486
0.625	7.500	4.500	0.000	0.000	0.000	0.000	0.000	0.000	2.596	0.000	0.000	2.596
0.667	8.000	5.000	0.000	0.000	0.000	0.000	0.000	0.000	2.702	0.000	0.000	2.702
0.708	8.500	5.500	0.000	0.000	0.000	0.000	0.000	0.000	2.804	0.000	0.019	2.823
0.750	9.000	6.000	0.000	0.000	0.000	0.000	0.000	0.000	2.903	0.000	0.277	3.180
0.792	9.500	6.500	0.000	0.000	0.000	0.000	0.000	0.000	2.998	0.000	0.688	3.686
0.833	10.000	7.000	0.000	0.000	0.000	0.000	0.000	0.000	3.090	0.000	1.207	4.297
0.875	10.500	7.500	0.000	0.000	0.000	0.000	0.000	0.000	3.180	0.000	1.816	4.995
0.917	11.000	8.000	0.000	0.000	0.000	0.000	0.000	0.000	3.267	0.000	2.501	5.768
0.958	11.500	8.500	0.000	0.000	0.000	0.000	0.000	0.000	3.352	0.000	3.256	6.608
1.000	12.000	9.000	0.000	0.000	0.000	0.000	0.000	0.000	3.434	0.000	4.075	7.509


Graph for Reservoir "Reservoir-1"
Reservoir "Reservoir-1" Results for Run "Q100"
Storage (AC-FT)
Elev (ft)
0.15
0.14
0.13
0.12
0.11
0.10
0.09
1.60
1.50
1.40
1.30
1.20
1.10
1.00
Flow (cfs)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
01Jan2000
Legend (Compute Time: DATA CHANGED, RECOMPUTE)
Run:Q100 Element:Reservoir-1 Result:Storage EXPIRED
Run:Q100 Element:Reservoir-1 Result:Pool Elevation EXPIRED
Run:Q100 Element:Reservoir-1 Result:Outflow EXPIRED
Run:Q100 Element:Reservoir-1 Result:Combined Inflow EXPIRED

Project: Bonita Simulation Run: Q100
Reservoir: Reservoir-1

Start of Run:	01Jan2000, 00:00	Basin Model:	Basin 1
End of Run:	01Jan2000, 07:00	Meteorologic Model:	Met 1
Compute Time:	03May2023, 11:04:29	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	4.08 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 04:13
Peak Discharge:	2.23 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 04:19
Inflow Volume:	n/a	Peak Storage:	0.14 (ACRE-FT)
Discharge Volume:	n/a	Peak Elevation:	1.504 (FT)

Project: Bonita Simulation Run: Q100
Reservoir: Reservoir-1

Start of Run: 01Jan2000, 00:00 Basin Model: Basin 1
End of Run: 01Jan2000, 07:00 Meteorologic Model: Met 1
Compute Time: 03May2023, 11:04:29 Control Specifications: Control 1

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:00	0.00	0.09	1.000	0.00
01Jan2000	00:01	0.02	0.09	1.000	0.00
01Jan2000	00:02	0.04	0.09	1.001	0.00
01Jan2000	00:03	0.05	0.09	1.001	0.00
01Jan2000	00:04	0.07	0.09	1.002	0.00
01Jan2000	00:05	0.09	0.09	1.003	0.00
01Jan2000	00:06	0.11	0.09	1.005	0.00
01Jan2000	00:07	0.13	0.09	1.006	0.00
01Jan2000	00:08	0.15	0.09	1.008	0.00
01Jan2000	00:09	0.16	0.09	1.011	0.00
01Jan2000	00:10	0.18	0.09	1.013	0.00
01Jan2000	00:11	0.20	0.09	1.016	0.00
01Jan2000	00:12	0.20	0.09	1.019	0.00
01Jan2000	00:13	0.20	0.09	1.022	0.00
01Jan2000	00:14	0.20	0.09	1.025	0.00
01Jan2000	00:15	0.20	0.09	1.028	0.00
01Jan2000	00:16	0.20	0.09	1.030	0.00
01Jan2000	00:17	0.20	0.09	1.033	0.00
01Jan2000	00:18	0.20	0.09	1.036	0.00
01Jan2000	00:19	0.20	0.09	1.039	0.00
01Jan2000	00:20	0.20	0.09	1.042	0.00
01Jan2000	00:21	0.20	0.09	1.045	0.00
01Jan2000	00:22	0.20	0.09	1.048	0.00
01Jan2000	00:23	0.20	0.09	1.051	0.00
01Jan2000	00:24	0.20	0.09	1.054	0.00
01Jan2000	00:25	0.20	0.10	1.056	0.00

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:26	0.20	0.10	1.059	0.01
01Jan2000	00:27	0.20	0.10	1.061	0.01
01Jan2000	00:28	0.20	0.10	1.064	0.02
01Jan2000	00:29	0.20	0.10	1.066	0.02
01Jan2000	00:30	0.20	0.10	1.068	0.03
01Jan2000	00:31	0.20	0.10	1.070	0.03
01Jan2000	00:32	0.20	0.10	1.073	0.04
01Jan2000	00:33	0.20	0.10	1.075	0.04
01Jan2000	00:34	0.20	0.10	1.077	0.05
01Jan2000	00:35	0.20	0.10	1.079	0.05
01Jan2000	00:36	0.20	0.10	1.081	0.05
01Jan2000	00:37	0.20	0.10	1.082	0.06
01Jan2000	00:38	0.20	0.10	1.084	0.06
01Jan2000	00:39	0.20	0.10	1.086	0.07
01Jan2000	00:40	0.20	0.10	1.088	0.07
01Jan2000	00:41	0.20	0.10	1.089	0.07
01Jan2000	00:42	0.20	0.10	1.091	0.08
01Jan2000	00:43	0.20	0.10	1.093	0.08
01Jan2000	00:44	0.20	0.10	1.094	0.09
01Jan2000	00:45	0.20	0.10	1.096	0.09
01Jan2000	00:46	0.20	0.10	1.097	0.10
01Jan2000	00:47	0.20	0.10	1.098	0.10
01Jan2000	00:48	0.20	0.10	1.099	0.11
01Jan2000	00:49	0.20	0.10	1.101	0.11
01Jan2000	00:50	0.20	0.10	1.102	0.12
01Jan2000	00:51	0.20	0.10	1.103	0.12
01Jan2000	00:52	0.20	0.10	1.104	0.12
01Jan2000	00:53	0.20	0.10	1.105	0.13
01Jan2000	00:54	0.20	0.10	1.106	0.13
01Jan2000	00:55	0.20	0.10	1.107	0.13
01Jan2000	00:56	0.20	0.10	1.107	0.14

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:57	0.20	0.10	1.108	0.14
01Jan2000	00:58	0.20	0.10	1.109	0.14
01Jan2000	00:59	0.20	0.10	1.110	0.15
01Jan2000	01:00	0.20	0.10	1.110	0.15
01Jan2000	01:01	0.20	0.10	1.111	0.15
01Jan2000	01:02	0.20	0.10	1.112	0.15
01Jan2000	01:03	0.20	0.10	1.112	0.16
01Jan2000	01:04	0.20	0.10	1.113	0.16
01Jan2000	01:05	0.20	0.10	1.113	0.16
01Jan2000	01:06	0.20	0.10	1.114	0.16
01Jan2000	01:07	0.20	0.10	1.114	0.16
01Jan2000	01:08	0.20	0.10	1.115	0.17
01Jan2000	01:09	0.20	0.10	1.115	0.17
01Jan2000	01:10	0.20	0.10	1.116	0.17
01Jan2000	01:11	0.20	0.10	1.116	0.17
01Jan2000	01:12	0.20	0.10	1.116	0.17
01Jan2000	01:13	0.20	0.10	1.117	0.17
01Jan2000	01:14	0.20	0.10	1.117	0.17
01Jan2000	01:15	0.20	0.10	1.117	0.18
01Jan2000	01:16	0.20	0.10	1.118	0.18
01Jan2000	01:17	0.20	0.10	1.118	0.18
01Jan2000	01:18	0.20	0.10	1.118	0.18
01Jan2000	01:19	0.20	0.10	1.119	0.18
01Jan2000	01:20	0.20	0.10	1.119	0.18
01Jan2000	01:21	0.20	0.10	1.119	0.18
01Jan2000	01:22	0.20	0.10	1.119	0.18
01Jan2000	01:23	0.20	0.10	1.119	0.18
01Jan2000	01:24	0.20	0.10	1.120	0.18
01Jan2000	01:25	0.20	0.10	1.120	0.19
01Jan2000	01:26	0.20	0.10	1.120	0.19
01Jan2000	01:27	0.20	0.10	1.120	0.19

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:28	0.20	0.10	1.120	0.19
01Jan2000	01:29	0.20	0.10	1.121	0.19
01Jan2000	01:30	0.20	0.10	1.121	0.19
01Jan2000	01:31	0.20	0.10	1.121	0.19
01Jan2000	01:32	0.20	0.10	1.121	0.19
01Jan2000	01:33	0.20	0.10	1.121	0.19
01Jan2000	01:34	0.20	0.10	1.121	0.19
01Jan2000	01:35	0.20	0.10	1.121	0.19
01Jan2000	01:36	0.20	0.10	1.122	0.19
01Jan2000	01:37	0.20	0.10	1.122	0.19
01Jan2000	01:38	0.20	0.10	1.122	0.19
01Jan2000	01:39	0.20	0.10	1.122	0.19
01Jan2000	01:40	0.20	0.10	1.122	0.19
01Jan2000	01:41	0.20	0.10	1.122	0.19
01Jan2000	01:42	0.20	0.10	1.122	0.19
01Jan2000	01:43	0.20	0.10	1.122	0.19
01Jan2000	01:44	0.20	0.10	1.122	0.19
01Jan2000	01:45	0.20	0.10	1.122	0.19
01Jan2000	01:46	0.20	0.10	1.122	0.19
01Jan2000	01:47	0.20	0.10	1.122	0.20
01Jan2000	01:48	0.20	0.10	1.123	0.20
01Jan2000	01:49	0.20	0.10	1.123	0.20
01Jan2000	01:50	0.20	0.10	1.123	0.20
01Jan2000	01:51	0.20	0.10	1.123	0.20
01Jan2000	01:52	0.20	0.10	1.123	0.20
01Jan2000	01:53	0.20	0.10	1.123	0.20
01Jan2000	01:54	0.20	0.10	1.123	0.20
01Jan2000	01:55	0.20	0.10	1.123	0.20
01Jan2000	01:56	0.20	0.10	1.123	0.20
01Jan2000	01:57	0.20	0.10	1.123	0.20
01Jan2000	01:58	0.20	0.10	1.123	0.20

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:59	0.20	0.10	1.123	0.20
01Jan2000	02:00	0.20	0.10	1.123	0.20
01Jan2000	02:01	0.20	0.10	1.123	0.20
01Jan2000	02:02	0.20	0.10	1.123	0.20
01Jan2000	02:03	0.20	0.10	1.123	0.20
01Jan2000	02:04	0.20	0.10	1.123	0.20
01Jan2000	02:05	0.20	0.10	1.123	0.20
01Jan2000	02:06	0.20	0.10	1.123	0.20
01Jan2000	02:07	0.20	0.10	1.123	0.20
01Jan2000	02:08	0.20	0.10	1.123	0.20
01Jan2000	02:09	0.20	0.10	1.123	0.20
01Jan2000	02:10	0.20	0.10	1.123	0.20
01Jan2000	02:11	0.20	0.10	1.123	0.20
01Jan2000	02:12	0.20	0.10	1.123	0.20
01Jan2000	02:13	0.21	0.10	1.123	0.20
01Jan2000	02:14	0.22	0.10	1.124	0.20
01Jan2000	02:15	0.23	0.10	1.124	0.20
01Jan2000	02:16	0.24	0.10	1.124	0.20
01Jan2000	02:17	0.25	0.10	1.125	0.20
01Jan2000	02:18	0.25	0.10	1.126	0.21
01Jan2000	02:19	0.26	0.10	1.126	0.21
01Jan2000	02:20	0.27	0.10	1.127	0.21
01Jan2000	02:21	0.28	0.10	1.128	0.21
01Jan2000	02:22	0.29	0.10	1.129	0.22
01Jan2000	02:23	0.30	0.10	1.129	0.22
01Jan2000	02:24	0.30	0.10	1.130	0.23
01Jan2000	02:25	0.30	0.10	1.131	0.23
01Jan2000	02:26	0.30	0.10	1.132	0.24
01Jan2000	02:27	0.30	0.10	1.133	0.24
01Jan2000	02:28	0.30	0.10	1.134	0.24
01Jan2000	02:29	0.30	0.10	1.135	0.25

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	02:30	0.30	0.10	1.135	0.25
01Jan2000	02:31	0.30	0.10	1.136	0.25
01Jan2000	02:32	0.30	0.10	1.136	0.26
01Jan2000	02:33	0.30	0.10	1.137	0.26
01Jan2000	02:34	0.30	0.10	1.138	0.26
01Jan2000	02:35	0.30	0.10	1.138	0.26
01Jan2000	02:36	0.30	0.10	1.138	0.27
01Jan2000	02:37	0.30	0.10	1.139	0.27
01Jan2000	02:38	0.30	0.10	1.139	0.27
01Jan2000	02:39	0.30	0.10	1.140	0.27
01Jan2000	02:40	0.30	0.10	1.140	0.27
01Jan2000	02:41	0.30	0.10	1.140	0.28
01Jan2000	02:42	0.30	0.10	1.141	0.28
01Jan2000	02:43	0.30	0.10	1.141	0.28
01Jan2000	02:44	0.30	0.10	1.141	0.28
01Jan2000	02:45	0.30	0.10	1.142	0.28
01Jan2000	02:46	0.30	0.10	1.142	0.28
01Jan2000	02:47	0.30	0.10	1.142	0.28
01Jan2000	02:48	0.30	0.10	1.142	0.28
01Jan2000	02:49	0.30	0.10	1.142	0.29
01Jan2000	02:50	0.30	0.10	1.143	0.29
01Jan2000	02:51	0.30	0.10	1.143	0.29
01Jan2000	02:52	0.30	0.10	1.143	0.29
01Jan2000	02:53	0.30	0.10	1.143	0.29
01Jan2000	02:54	0.30	0.10	1.143	0.29
01Jan2000	02:55	0.30	0.10	1.143	0.29
01Jan2000	02:56	0.30	0.10	1.143	0.29
01Jan2000	02:57	0.31	0.10	1.144	0.29
01Jan2000	02:58	0.32	0.10	1.144	0.29
01Jan2000	02:59	0.33	0.10	1.144	0.29
01Jan2000	03:00	0.34	0.10	1.145	0.30

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:01	0.35	0.10	1.145	0.30
01Jan2000	03:02	0.35	0.10	1.146	0.30
01Jan2000	03:03	0.36	0.10	1.147	0.31
01Jan2000	03:04	0.37	0.10	1.147	0.31
01Jan2000	03:05	0.38	0.10	1.148	0.31
01Jan2000	03:06	0.39	0.11	1.149	0.32
01Jan2000	03:07	0.40	0.11	1.150	0.32
01Jan2000	03:08	0.40	0.11	1.151	0.33
01Jan2000	03:09	0.40	0.11	1.152	0.33
01Jan2000	03:10	0.40	0.11	1.153	0.34
01Jan2000	03:11	0.40	0.11	1.154	0.34
01Jan2000	03:12	0.40	0.11	1.154	0.34
01Jan2000	03:13	0.40	0.11	1.155	0.35
01Jan2000	03:14	0.40	0.11	1.156	0.35
01Jan2000	03:15	0.40	0.11	1.156	0.35
01Jan2000	03:16	0.40	0.11	1.157	0.36
01Jan2000	03:17	0.40	0.11	1.157	0.36
01Jan2000	03:18	0.40	0.11	1.158	0.36
01Jan2000	03:19	0.41	0.11	1.159	0.37
01Jan2000	03:20	0.42	0.11	1.159	0.37
01Jan2000	03:21	0.43	0.11	1.160	0.37
01Jan2000	03:22	0.44	0.11	1.161	0.38
01Jan2000	03:23	0.45	0.11	1.162	0.38
01Jan2000	03:24	0.45	0.11	1.162	0.38
01Jan2000	03:25	0.46	0.11	1.163	0.39
01Jan2000	03:26	0.47	0.11	1.164	0.39
01Jan2000	03:27	0.48	0.11	1.165	0.40
01Jan2000	03:28	0.49	0.11	1.166	0.40
01Jan2000	03:29	0.50	0.11	1.168	0.41
01Jan2000	03:30	0.51	0.11	1.169	0.42
01Jan2000	03:31	0.52	0.11	1.170	0.42

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:32	0.53	0.11	1.171	0.43
01Jan2000	03:33	0.54	0.11	1.173	0.44
01Jan2000	03:34	0.55	0.11	1.174	0.45
01Jan2000	03:35	0.55	0.11	1.175	0.45
01Jan2000	03:36	0.56	0.11	1.176	0.46
01Jan2000	03:37	0.57	0.11	1.178	0.47
01Jan2000	03:38	0.58	0.11	1.179	0.48
01Jan2000	03:39	0.59	0.11	1.180	0.48
01Jan2000	03:40	0.60	0.11	1.182	0.49
01Jan2000	03:41	0.62	0.11	1.183	0.50
01Jan2000	03:42	0.64	0.11	1.185	0.51
01Jan2000	03:43	0.65	0.11	1.187	0.52
01Jan2000	03:44	0.67	0.11	1.188	0.53
01Jan2000	03:45	0.69	0.11	1.190	0.54
01Jan2000	03:46	0.71	0.11	1.192	0.55
01Jan2000	03:47	0.73	0.11	1.194	0.57
01Jan2000	03:48	0.75	0.11	1.196	0.58
01Jan2000	03:49	0.76	0.11	1.199	0.59
01Jan2000	03:50	0.78	0.11	1.201	0.60
01Jan2000	03:51	0.80	0.11	1.203	0.62
01Jan2000	03:52	0.84	0.11	1.206	0.63
01Jan2000	03:53	0.87	0.11	1.208	0.65
01Jan2000	03:54	0.91	0.11	1.211	0.67
01Jan2000	03:55	0.95	0.11	1.215	0.69
01Jan2000	03:56	0.98	0.11	1.218	0.72
01Jan2000	03:57	1.02	0.11	1.222	0.74
01Jan2000	03:58	1.05	0.11	1.225	0.76
01Jan2000	03:59	1.09	0.11	1.229	0.79
01Jan2000	04:00	1.13	0.11	1.233	0.82
01Jan2000	04:01	1.16	0.11	1.237	0.84
01Jan2000	04:02	1.20	0.11	1.241	0.87

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:03	1.46	0.12	1.247	0.91
01Jan2000	04:04	1.72	0.12	1.256	0.97
01Jan2000	04:05	1.99	0.12	1.267	1.05
01Jan2000	04:06	2.25	0.12	1.280	1.15
01Jan2000	04:07	2.51	0.12	1.295	1.27
01Jan2000	04:08	2.77	0.12	1.312	1.41
01Jan2000	04:09	3.03	0.12	1.331	1.53
01Jan2000	04:10	3.29	0.13	1.351	1.64
01Jan2000	04:11	3.56	0.13	1.374	1.75
01Jan2000	04:12	3.82	0.13	1.398	1.85
01Jan2000	04:13	4.08	0.13	1.425	1.95
01Jan2000	04:14	3.77	0.14	1.450	2.05
01Jan2000	04:15	3.47	0.14	1.470	2.12
01Jan2000	04:16	3.16	0.14	1.485	2.17
01Jan2000	04:17	2.85	0.14	1.496	2.21
01Jan2000	04:18	2.54	0.14	1.502	2.23
01Jan2000	04:19	2.24	0.14	1.504	2.23
01Jan2000	04:20	1.93	0.14	1.502	2.23
01Jan2000	04:21	1.62	0.14	1.497	2.21
01Jan2000	04:22	1.31	0.14	1.487	2.18
01Jan2000	04:23	1.01	0.14	1.474	2.13
01Jan2000	04:24	0.70	0.14	1.458	2.07
01Jan2000	04:25	0.67	0.14	1.440	2.01
01Jan2000	04:26	0.65	0.13	1.423	1.95
01Jan2000	04:27	0.62	0.13	1.406	1.88
01Jan2000	04:28	0.59	0.13	1.390	1.82
01Jan2000	04:29	0.56	0.13	1.374	1.75
01Jan2000	04:30	0.54	0.13	1.359	1.69
01Jan2000	04:31	0.51	0.13	1.345	1.61
01Jan2000	04:32	0.48	0.12	1.331	1.53
01Jan2000	04:33	0.45	0.12	1.317	1.45

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:34	0.43	0.12	1.305	1.35
01Jan2000	04:35	0.40	0.12	1.293	1.26
01Jan2000	04:36	0.39	0.12	1.282	1.17
01Jan2000	04:37	0.38	0.12	1.273	1.10
01Jan2000	04:38	0.37	0.12	1.264	1.03
01Jan2000	04:39	0.36	0.12	1.255	0.97
01Jan2000	04:40	0.35	0.12	1.248	0.92
01Jan2000	04:41	0.35	0.11	1.241	0.87
01Jan2000	04:42	0.34	0.11	1.234	0.82
01Jan2000	04:43	0.33	0.11	1.228	0.78
01Jan2000	04:44	0.32	0.11	1.222	0.74
01Jan2000	04:45	0.31	0.11	1.217	0.71
01Jan2000	04:46	0.30	0.11	1.212	0.68
01Jan2000	04:47	0.30	0.11	1.207	0.64
01Jan2000	04:48	0.30	0.11	1.203	0.62
01Jan2000	04:49	0.30	0.11	1.199	0.59
01Jan2000	04:50	0.30	0.11	1.195	0.57
01Jan2000	04:51	0.30	0.11	1.192	0.55
01Jan2000	04:52	0.30	0.11	1.189	0.53
01Jan2000	04:53	0.30	0.11	1.186	0.52
01Jan2000	04:54	0.30	0.11	1.183	0.50
01Jan2000	04:55	0.30	0.11	1.181	0.49
01Jan2000	04:56	0.30	0.11	1.178	0.47
01Jan2000	04:57	0.30	0.11	1.176	0.46
01Jan2000	04:58	0.30	0.11	1.174	0.45
01Jan2000	04:59	0.30	0.11	1.172	0.44
01Jan2000	05:00	0.30	0.11	1.170	0.43
01Jan2000	05:01	0.30	0.11	1.169	0.42
01Jan2000	05:02	0.30	0.11	1.167	0.41
01Jan2000	05:03	0.30	0.11	1.166	0.40
01Jan2000	05:04	0.30	0.11	1.165	0.40

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:05	0.30	0.11	1.164	0.39
01Jan2000	05:06	0.30	0.11	1.162	0.38
01Jan2000	05:07	0.30	0.11	1.161	0.38
01Jan2000	05:08	0.30	0.11	1.160	0.37
01Jan2000	05:09	0.29	0.11	1.159	0.37
01Jan2000	05:10	0.28	0.11	1.158	0.36
01Jan2000	05:11	0.27	0.11	1.157	0.36
01Jan2000	05:12	0.26	0.11	1.156	0.35
01Jan2000	05:13	0.25	0.11	1.155	0.35
01Jan2000	05:14	0.25	0.11	1.154	0.34
01Jan2000	05:15	0.24	0.11	1.152	0.33
01Jan2000	05:16	0.23	0.11	1.151	0.33
01Jan2000	05:17	0.22	0.11	1.150	0.32
01Jan2000	05:18	0.21	0.10	1.148	0.32
01Jan2000	05:19	0.20	0.10	1.147	0.31
01Jan2000	05:20	0.20	0.10	1.146	0.30
01Jan2000	05:21	0.20	0.10	1.144	0.30
01Jan2000	05:22	0.20	0.10	1.143	0.29
01Jan2000	05:23	0.20	0.10	1.142	0.28
01Jan2000	05:24	0.20	0.10	1.141	0.28
01Jan2000	05:25	0.20	0.10	1.140	0.27
01Jan2000	05:26	0.20	0.10	1.139	0.27
01Jan2000	05:27	0.20	0.10	1.138	0.26
01Jan2000	05:28	0.20	0.10	1.137	0.26
01Jan2000	05:29	0.20	0.10	1.137	0.26
01Jan2000	05:30	0.20	0.10	1.136	0.25
01Jan2000	05:31	0.20	0.10	1.135	0.25
01Jan2000	05:32	0.20	0.10	1.135	0.25
01Jan2000	05:33	0.20	0.10	1.134	0.24
01Jan2000	05:34	0.20	0.10	1.133	0.24
01Jan2000	05:35	0.20	0.10	1.133	0.24

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:36	0.20	0.10	1.132	0.24
01Jan2000	05:37	0.20	0.10	1.132	0.23
01Jan2000	05:38	0.20	0.10	1.132	0.23
01Jan2000	05:39	0.20	0.10	1.131	0.23
01Jan2000	05:40	0.20	0.10	1.131	0.23
01Jan2000	05:41	0.20	0.10	1.130	0.23
01Jan2000	05:42	0.20	0.10	1.130	0.22
01Jan2000	05:43	0.20	0.10	1.130	0.22
01Jan2000	05:44	0.20	0.10	1.129	0.22
01Jan2000	05:45	0.20	0.10	1.129	0.22
01Jan2000	05:46	0.20	0.10	1.129	0.22
01Jan2000	05:47	0.20	0.10	1.129	0.22
01Jan2000	05:48	0.20	0.10	1.128	0.22
01Jan2000	05:49	0.20	0.10	1.128	0.22
01Jan2000	05:50	0.20	0.10	1.128	0.22
01Jan2000	05:51	0.20	0.10	1.128	0.22
01Jan2000	05:52	0.20	0.10	1.128	0.21
01Jan2000	05:53	0.20	0.10	1.127	0.21
01Jan2000	05:54	0.20	0.10	1.127	0.21
01Jan2000	05:55	0.20	0.10	1.127	0.21
01Jan2000	05:56	0.20	0.10	1.127	0.21
01Jan2000	05:57	0.20	0.10	1.127	0.21
01Jan2000	05:58	0.20	0.10	1.127	0.21
01Jan2000	05:59	0.20	0.10	1.126	0.21
01Jan2000	06:00	0.20	0.10	1.126	0.21
01Jan2000	06:01	0.20	0.10	1.126	0.21
01Jan2000	06:02	0.20	0.10	1.126	0.21
01Jan2000	06:03	0.20	0.10	1.126	0.21
01Jan2000	06:04	0.18	0.10	1.126	0.21
01Jan2000	06:05	0.16	0.10	1.125	0.21
01Jan2000	06:06	0.15	0.10	1.125	0.20

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:07	0.13	0.10	1.124	0.20
01Jan2000	06:08	0.11	0.10	1.123	0.20
01Jan2000	06:09	0.09	0.10	1.122	0.19
01Jan2000	06:10	0.07	0.10	1.120	0.19
01Jan2000	06:11	0.05	0.10	1.119	0.18
01Jan2000	06:12	0.04	0.10	1.117	0.17
01Jan2000	06:13	0.02	0.10	1.115	0.17
01Jan2000	06:14	0.00	0.10	1.113	0.16
01Jan2000	06:15	0.00	0.10	1.111	0.15
01Jan2000	06:16	0.00	0.10	1.109	0.14
01Jan2000	06:17	0.00	0.10	1.107	0.14
01Jan2000	06:18	0.00	0.10	1.105	0.13
01Jan2000	06:19	0.00	0.10	1.104	0.12
01Jan2000	06:20	0.00	0.10	1.102	0.12
01Jan2000	06:21	0.00	0.10	1.101	0.11
01Jan2000	06:22	0.00	0.10	1.099	0.11
01Jan2000	06:23	0.00	0.10	1.098	0.10
01Jan2000	06:24	0.00	0.10	1.097	0.10
01Jan2000	06:25	0.00	0.10	1.095	0.09
01Jan2000	06:26	0.00	0.10	1.094	0.09
01Jan2000	06:27	0.00	0.10	1.093	0.08
01Jan2000	06:28	0.00	0.10	1.092	0.08
01Jan2000	06:29	0.00	0.10	1.091	0.08
01Jan2000	06:30	0.00	0.10	1.090	0.07
01Jan2000	06:31	0.00	0.10	1.089	0.07
01Jan2000	06:32	0.00	0.10	1.088	0.07
01Jan2000	06:33	0.00	0.10	1.087	0.07
01Jan2000	06:34	0.00	0.10	1.086	0.07
01Jan2000	06:35	0.00	0.10	1.086	0.07
01Jan2000	06:36	0.00	0.10	1.085	0.06
01Jan2000	06:37	0.00	0.10	1.084	0.06

Date	Time	Inflow (CFS)	Storage (ACRE-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:38	0.00	0.10	1.083	0.06
01Jan2000	06:39	0.00	0.10	1.082	0.06
01Jan2000	06:40	0.00	0.10	1.082	0.06
01Jan2000	06:41	0.00	0.10	1.081	0.06
01Jan2000	06:42	0.00	0.10	1.080	0.05
01Jan2000	06:43	0.00	0.10	1.079	0.05
01Jan2000	06:44	0.00	0.10	1.079	0.05
01Jan2000	06:45	0.00	0.10	1.078	0.05
01Jan2000	06:46	0.00	0.10	1.077	0.05
01Jan2000	06:47	0.00	0.10	1.077	0.05
01Jan2000	06:48	0.00	0.10	1.076	0.05
01Jan2000	06:49	0.00	0.10	1.076	0.04
01Jan2000	06:50	0.00	0.10	1.075	0.04
01Jan2000	06:51	0.00	0.10	1.075	0.04
01Jan2000	06:52	0.00	0.10	1.074	0.04
01Jan2000	06:53	0.00	0.10	1.073	0.04
01Jan2000	06:54	0.00	0.10	1.073	0.04
01Jan2000	06:55	0.00	0.10	1.072	0.04
01Jan2000	06:56	0.00	0.10	1.072	0.04
01Jan2000	06:57	0.00	0.10	1.071	0.04
01Jan2000	06:58	0.00	0.10	1.071	0.03
01Jan2000	06:59	0.00	0.10	1.071	0.03
01Jan2000	07:00	0.00	0.10	1.070	0.03

BASIN STAGE STORAGE CALCULATIONS

Depth (ft)	Elev (ft)	Area (ft2)	Vol (ft3)	Vol (Ac-Ft)
0	76	3580	0	0
1	77	4196	3888	0.089256
2	78	4987	8479.5	0.194663

CHAPTER 4 - 100 YEAR HYDROLOGIC ANALYSIS FOR EXISTING CONDITIONS

WEIGHTED C CALCULATIONS

C	D	
2.214371	0.237006	2.451377

90%	10%

Pre

C	D	
0.36	0.41	0.364834

Post

C	D	
0.54	0.57	0.5429

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1643

                            Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* VALLEY VIEW SITE                                                      *
* 100 YEAR EXISTING CONDITION HYDROLOGIC ANALYSIS                       *
*                                                                       *
 ************************************************************************

  FILE NAME: BONEX100.DAT
  TIME/DATE OF STUDY: 08:02 08/04/2022
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.700
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =     94.00
  DOWNSTREAM ELEVATION(FEET) =     81.50
  ELEVATION DIFFERENCE(FEET) =     12.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.183
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.203
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.40

**************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     81.50  DOWNSTREAM(FEET) =     70.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   368.00   CHANNEL SLOPE =  0.0291
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.674
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.80
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   3.41
  Tc(MIN.) =    9.59
  SUBAREA AREA(ACRES) =     2.27       SUBAREA RUNOFF(CFS) =    3.82
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.360
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       4.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   2.23
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     468.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.5  TC(MIN.) =      9.59
  PEAK FLOW RATE(CFS)   =       4.12
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

CHAPTER 5 - 100 YEAR HYDROLOGIC ANALYSIS FOR DEVELOPED CONDITIONS

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1643

                            Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* BONITA RESIDENTIAL SITE                                                *
* 100 YEAR DEVELOPED CONDITION HYDROLOGIC ANALYSIS                       *
*                                                                        *
 ************************************************************************

  FILE NAME: BODEV100.DAT
  TIME/DATE OF STUDY: 11:25 05/03/2023
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.700
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =     84.00
  DOWNSTREAM ELEVATION(FEET) =     83.35
  ELEVATION DIFFERENCE(FEET) =      0.65
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.127
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.200
```

```
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   83.35  DOWNSTREAM ELEVATION(FEET) =   76.10
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.25
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    5.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.38
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.62
  STREET FLOW TRAVEL TIME(MIN.) =   3.09   Tc(MIN.) =   11.21
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.225
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.540
  SUBAREA AREA(ACRES) =    1.67      SUBAREA RUNOFF(CFS) =    3.81
  TOTAL AREA(ACRES) =        1.8        PEAK FLOW RATE(CFS) =       4.08

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   8.16
  FLOW VELOCITY(FEET/SEC.) =  2.59   DEPTH*VELOCITY(FT*FT/SEC.) =   0.80
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     505.00 FEET.

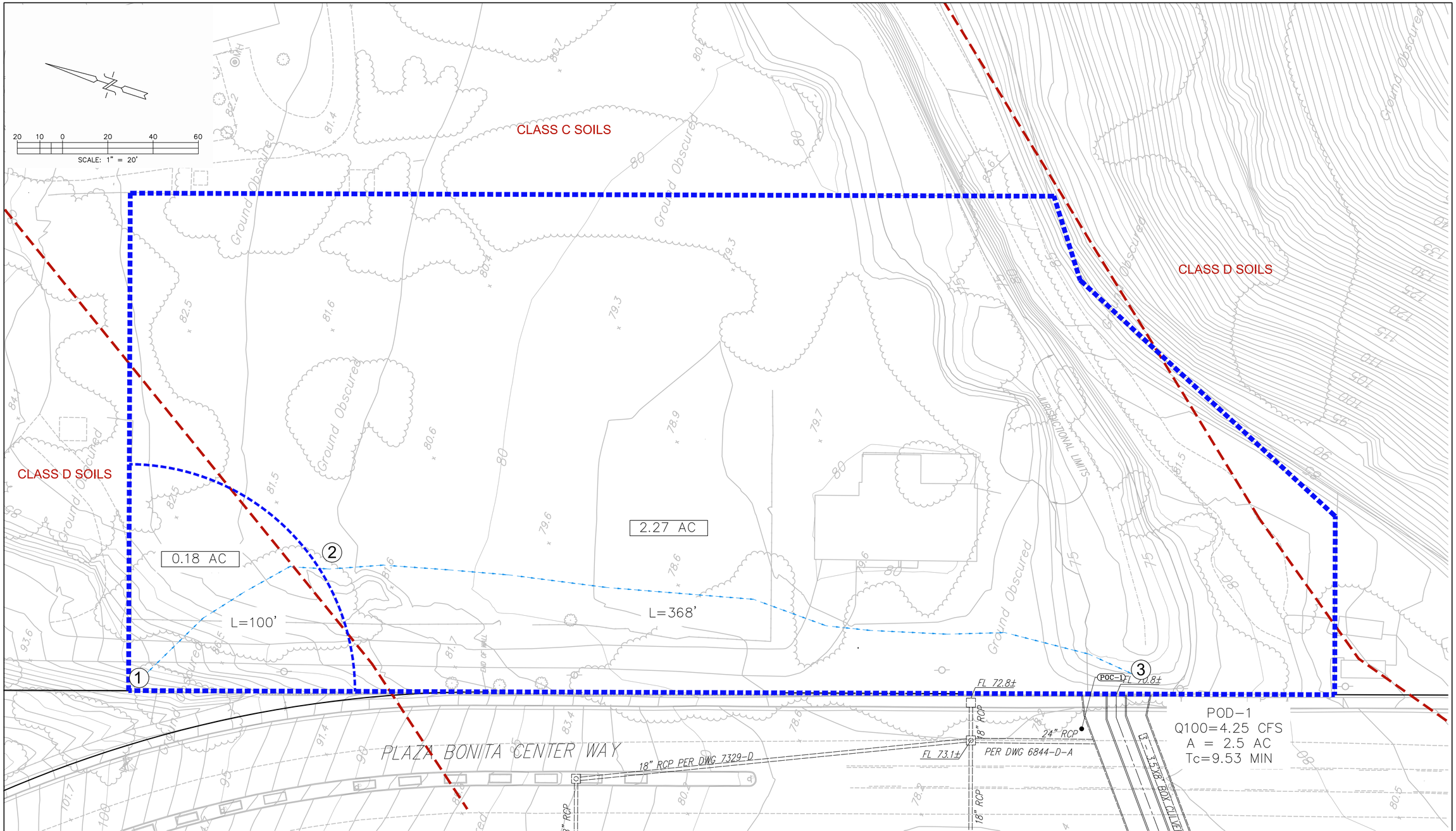
+----------------------------------------------------------------------------+
| ROUTED FLOWS FROM DETENTION BASIN                                          |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  17.21   RAIN INTENSITY(INCH/HOUR) =  3.21
  TOTAL AREA(ACRES) =     1.80   TOTAL RUNOFF(CFS) =      2.23

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.205
```

```
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3794
  SUBAREA AREA(ACRES) =    0.66   SUBAREA RUNOFF(CFS) =    0.76
  TOTAL AREA(ACRES) =        2.5   TOTAL RUNOFF(CFS) =       2.99
  TC(MIN.) =   17.21
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.5  TC(MIN.) =     17.21
  PEAK FLOW RATE(CFS)   =       2.99
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

CHAPTER 6 - HYDROLOGY MAPS



LEGEND

- WATERSHED AREAS
- SUB AREAS
- FLOWPATH
- NODE IDs (1)
- SOIL CLASS

NO.	DESCRIPTION	DATE	APP'D

REVISIONS

Civil Engineering · Environmental
Land Surveying

R·E·C Consultants, Inc.

2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

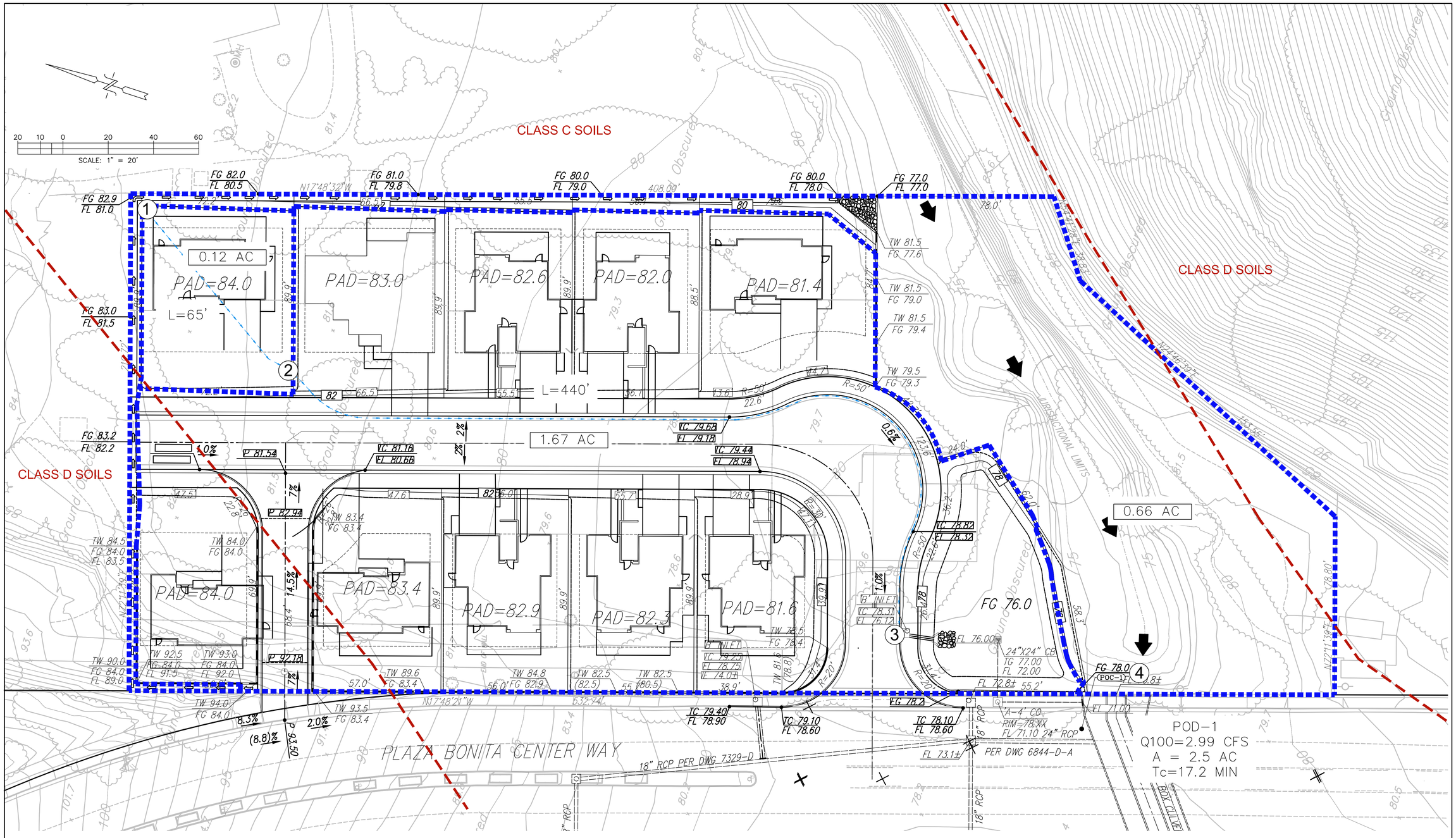
DATE: 12-14-2021
SCALE: 1" = 40'
DRAWN: E.R.F.
CHECKED: W.O.G.

SHEET TITLE: EX CONDITIONS HYDRO EXHIBIT

PROJECT: VALLEY VIEW
PLAZA BONITA CENTERWAY
BONITA, CA

SHEET 1 OF 1 SHEETS

SAVE DATE: 10/14/2022 ~ PLOT DATE: 10/14/2022 ~ FILE NAME: C:\Users\david\Desktop\Bonita\Exhibits\Pre_Dev_Q100.dwg



LEGEND

- WATERSHED AREAS
- SUB AREAS
- FLOWPATH
- NODE IDs (1)
- SOIL CLASS

REVISIONS			
NO.	DESCRIPTION	DATE	APP'D

R·E·C Consultants, Inc.
Civil Engineering · Environmental
Land Surveying
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

DATE: 12-14-202
SCALE: 1" = 40'
DRAWN: E.R.F.
CHECKED: W.O.G.

SHEET TITLE: DEV CONDITIONS HYDRO EXHIBIT

PROJECT: VALLEY VIEW
PLAZA BONITA CENTERWAY
BONITA, CA

SHEET 1 OF 1 SHEETS

SAVE DATE: 5/3/2023 ~ PLOT DATE: 5/3/2023 ~ FILE NAME: C:\Users\dovid\Desktop\Bonita\Exhibits\Post_Dev_Q100.dwg

5.1 Description of Existing Site Condition

Provide the requested information below for the project site in its existing condition.

a. Current Site Status

Select all that apply to any portion of the site.

- ☐ Existing development
- ☐ Previously graded but not built out
- ☐ Agricultural or other non-impervious use
- ☐ Vacant, undeveloped/natural
- ☐ Demolition completed without new construction

b. Existing Land Cover

Provide the area (in acres or square feet) within all applicable categories of land cover below. The total area should equal that of the entire project site.

	Area *(acres or ft²)*
☐ Vegetative Cover	Click here to enter text.
☐ Non-Vegetated Pervious Areas	Click here to enter text.
☐ Impervious Areas	Click here to enter text.

c. Underlying Soil

Select all soil groups that are present on the site.

NRCS Hydrologic Soil Group(s)			
Type A	Type B	Type C	Type D
☐	☐	☐	☐

5.2 Description of Existing Site Drainage

Describe how storm water runoff is conveyed from the site. At a minimum, address the following:

- Is the existing drainage conveyance ☐ **natural** or ☐ **urban**?
- Is runoff from offsite conveyed through the site? ☐ **Yes** ☐ **No**

  If **yes**, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site.
- Describe the existing project site drainage conveyance network (including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels).
- Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Summarize the pre-project drainage areas and design flows to each of the existing runoff discharge locations.
- Provide additional information as necessary or requested to describe the site drainage.

Description (add pages as necessary to provide all requested information).

Click here to enter text.

5.3 Description of Proposed Site Development

Provide a general description of the proposed site development, including at a minimum the information requested below. Add pages as necessary.

a. Project description/ Proposed land use and/or activities (project location, development type, size, numbers of units, etc.)

Click here to enter text.

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

Click here to enter text.

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

Click here to enter text.

d. Does the project include grading and changes to site topography? ☐ **Yes** ☐ **No**

*If **yes**, describe below.*

Click here to enter text.

5.4 Description of Proposed Site Drainage

A. Changes to Site Drainage -- Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)? ☐ **Yes** ☐ **No**

If **yes**:

- Describe (1) the proposed project site drainage conveyance network (including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels), and (2) the method for conveying offsite flows through or around the proposed project site.
- Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations.
- Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations.

Description (add pages as necessary to provide all requested information).
Click here to enter text.

7.0 General Requirements

- Submit this cover page and all required Sub-attachments for all structural BMPs proposed for the project.
- See the BMPDM sections and appendices listed under "BMPDM Design Resources" in the table below for additional explanation of design requirements. Constructed features must fully satisfy the requirements described in these resources, and any other guidance identified by the County.
- PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management. Completion of SWQMP Attachment 8 is also required for these BMPs.
- DMA Exhibits and Construction Plans: DMAs, features, and BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.
- Structural BMP Certification. All structural BMPs documented this attachment and in Attachment 8 must be certified by a registered engineer in Sub-attachment 7.1.
- Structural BMP Verification. Structural BMP installation must be verified by the County at the completion of construction. Applicants must complete an Installation Verification Form (Attachment 10).

Sub-attachments (check all that are completed)	**Requirement**	**BMPDM Design Resources**
☒ **7.1: Preparer's Certification**	Required	• N/A
☒ **7.2: Structural BMP Strategy**	Required	• BMPDM Sections 5.1., 5.3, 5.4, and Chapter 6 • BMPDM Appendix E (pages E-78 through E-210)
☒ **7.3: Structural BMP Checklist(s)**	Required	
☒ **7.4: Stormwater Pollutant Control Worksheet Calculations**	Required	• BMPDM Appendix B
☐ **7.5: Identification and Narrative of Receiving Water and Pollutants of Concern**	Required if flow-thru BMPs are proposed	• N/A

7.1 Engineer of Work Certification for Structural BMPs

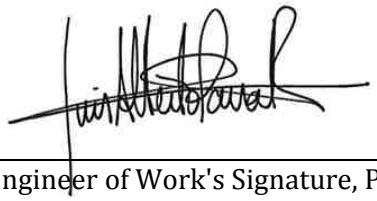
Project Name Valley View
Permit Application Number TBD

CERTIFICATION

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

I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of structural storm water BMPs for this project, of my responsibilities for their design.

☒ In addition to the structural pollutant control BMPs described in this attachment, this certification applies to the Structural Hydromodification Management BMPs described in Attachment 8 (check if applicable).



PE#: 66377, Exp: 6/30/24
Engineer of Work's Signature, PE Number & Expiration Date

Dr. Luis A Parra
Print Name

REC Consultants, Inc.
Company

17/10/22 Engineer's Seal:
Date

7.2 Structural BMP Strategy

7.2.1 Narrative Strategy (Continue description on subsequent pages as necessary)

Describe the general strategy for structural BMP implementation at the project site. For pollutant control BMPs, your description must address the key points outlined in Section 5.1 of the BMP Design Manual, and the type of BMPs selected. For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

All runoff from the developed portion of the project site is intercepted by a proposed dual purpose water quality and hydromodification detention basin located to the south of the project site.

The proposed bio-filtration BMP will treat runoff generated by all impervious areas located on the project site (DMA-1) prior to discharging these flows to the adjacent natural creek. A small, vegetated portion of the project site (DMA-2) bypasses flows around the development, confluencing with flows from the aforementioned BMP at the existing natural creek. DMA-2 is designated as a self-mitigating area.

The BMP has been sized in accordance with the County of San Diego's BMP sizing spreadsheet tool, while the HMP compliance has been achieved using the steps outlined in Attachment G.2.4 and Table G.2.5 of the San Diego County 2020 BMP Design Manual. Per the site specific geotechnical investigation, the underlying soil has a zero infiltration capacity, as such the BMP facility will be fully lined.

7.2.2 Structural BMP Summary Table (Complete for all proposed structural BMPs)

- List and provide the information requested below for all pollutant control and hydromodification management BMPs proposed for the project.
- For each BMP listed, complete the Structural BMP Checklist on the next page. Copy the Checklist as many times as needed.

BMP ID #	DMA #	DMA Area (ft²)	Structural BMP Type							Permit # and Sheet #
			Harvest and Use	Infiltration	Unlined Biofiltration	Lined Biofiltration	Flow-thru treatment	Hydromodification Management [1]	Other	
1	1	78,191	☐	☐	☐	☒	☐	☒	☐	
			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	
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			☐	☐	☐	☐	☐	☐	☐	
			☐	☐	☐	☐	☐	☐	☐	

Copy and Paste table here for additional BMPs

[1] Hydromodification Management BMPs must be accompanied by BMPs that provide pollutant control.

7.3 Structural BMP Checklist (Complete once for each proposed structural BMP)

Structural BMP ID # 1	**Permit # and Sheet #**
BMP Type	
Infiltration ☐ Infiltration basin (INF-1) ☐ Bioretention (INF-2) ☐ Permeable pavement (INF-3) **Unlined Biofiltration** ☐ Biofiltration with partial retention (PR-1) **Lined Biofiltration** ☒ Biofiltration (BF-1) ☐ Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3)	**Harvest and Use** ☐ Cistern (HU-1) **Flow-thru Treatment** (describe below) ☐ With prior lawful approval to meet earlier PDP requirements ☐ Pre-treatment/forebay for an onsite retention or biofiltration BMP[2] ☐ With alternative compliance **Hydromodification Management**[3] ☒ Detention pond or vault ☐ **Other** (describe below)
BMP Purpose	
☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification	☐ Pre-treatment/forebay for another BMP ☐ Other (describe below)
BMP Verification (See BMPDM Section 8.3)	
Provide name and contact information for the party responsible to sign BMP verification forms	REC Consultants, Inc. 2442 2nd Ave, San Diego, CA 92101 (619) 232-9200
BMP Ownership and Maintenance (See BMPDM Section 7.3 and Attachment 11)	
BMP Maintenance Category	Cat. 1 ☐ Cat. 2 ☒ Cat. 3 ☐ Cat. 4 ☐
Final owner of BMP	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe):
Maintenance of BMP into perpetuity	☒ HOA ☐ Property Owner ☐ County ☐ Other (describe):
Discussion (As needed; Continue on subsequent pages as necessary)	

Copy and Paste table here for additional BMPs

[2] Indicate which onsite retention or biofiltration BMP the pre-treatment/forebay serves.
[3] Hydromodification Management BMPs must be accompanied by BMPs that provide pollutant control.

7.4 Storm Water Pollutant Control Worksheet Calculations

- Use this page as a cover sheet for the submittal of any required worksheets below.
- Complete the checklist to identify which BMPDM Appendix B (Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods) worksheets are included with this attachment.
- See BMPDM Appendix B for an explanation of the applicability of individual worksheets and detailed guidance on their completion.

Worksheet	Requirement
☒ Worksheet B.1 Calculation of Design Capture Volume (DCV)	Required
☒ Worksheet B.2 Retention Requirements	Required
☒ Worksheet B.3 BMP Performance	Required
☐ Worksheet B.4 Major Maintenance Intervals for Reduced-sized BMPs	If applicable
☒ Other worksheets	As required

7.5 Identification and Narrative of Receiving Water and Pollutants of Concern

- Complete this sub-attachment *only if flow-thru treatment BMPs are implemented onsite* in lieu of retention or biofiltration BMPs. Unless excepted because of a Prior Lawful Approval[4], PDPs must also participate in an alternative compliance program[5].

A. General Description

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable).

B. Water Body Impairments and Priorities

List any 303(d) impaired water bodies[6] within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant

C. Identification of Project Site Pollutants

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix J.5)

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

[4] See BMPDM Appendix L: Prior Lawful Approval Requirements and Guidance.
[5] See SWQMP Attachment 12 (Alternative Compliance Projects) and BMPDM Appendix J (Offsite Alternative Compliance Requirements and Guidance).
[6] The current list of Section 303(d) impaired water bodies can be found at:
https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml

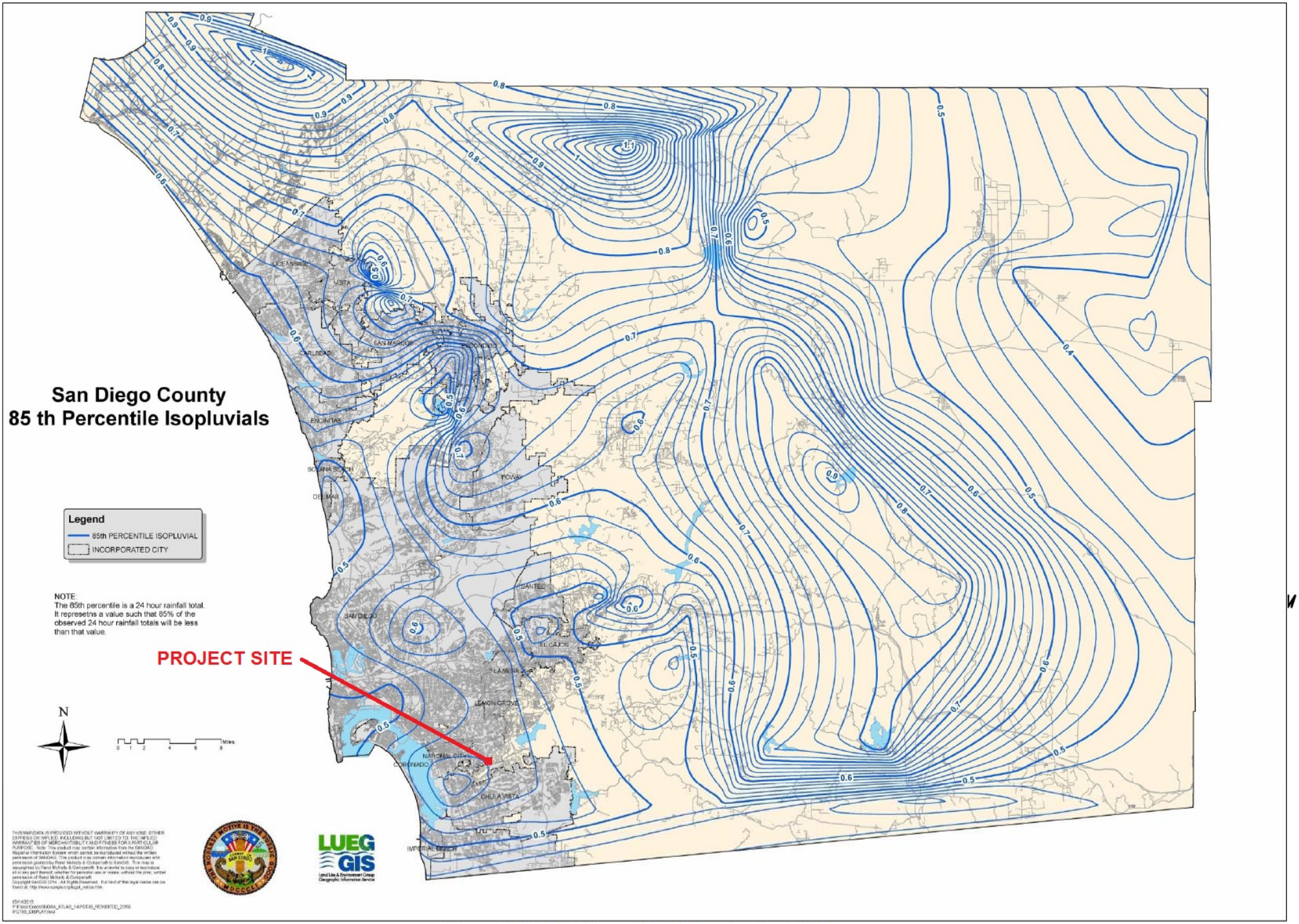


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

Automated Worksheet B.1: Calculation of Design Capture Volume (V2.0)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	DMA-1										unitless
	2	85th Percentile 24-hr Storm Depth	0.56										inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	43,485										sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)	34,050										sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Initial Runoff Factor Calculation	22	Total Tributary Area	77,535	0	0	0	0	0	0	0	0	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	26	Initial Design Capture Volume	1,990	0	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.55	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	1,990	0	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	36	Final Effective Tributary Area	42,644	0	0	0	0	0	0	0	0	0	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	1,990	0	0	0	0	0	0	0	0	0	cubic-feet

No Warning Messages

Automated Worksheet B.2: Retention Requirements (V2.0)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Basic Analysis	1	Drainage Basin ID or Name	DMA-1	-	-	-	-	-	-	-	-	-	unitless
	2	85th Percentile Rainfall Depth	0.56	-	-	-	-	-	-	-	-	-	inches
	3	Predominant NRCS Soil Type Within BMP Location	C										unitless
	4	Is proposed BMP location Restricted or Unrestricted for Infiltration Activities?	Unrestricted										unitless
	5	Nature of Restriction											unitless
	6	Do Minimum Retention Requirements Apply to this Project?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	7	Are Habitable Structures Greater than 9 Stories Proposed?	No										yes/no
Advanced Analysis	8	Has Geotechnical Engineer Performed an Infiltration Analysis?	Yes										yes/no
	9	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000										in/hr
Result	10	Design Infiltration Rate Used To Determine Retention Requirements	0.000	-	-	-	-	-	-	-	-	-	in/hr
	11	Percent of Average Annual Runoff that Must be Retained within DMA	4.5%	-	-	-	-	-	-	-	-	-	percentage
	12	Fraction of DCV Requiring Retention	0.02	-	-	-	-	-	-	-	-	-	ratio
	13	Required Retention Volume	40	-	-	-	-	-	-	-	-	-	cubic-feet

No Warning Messages

Automated Worksheet B.3: BMP Performance (V2.0)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	1	Drainage Basin ID or Name	DMA-1	-	-	-	-	-	-	-	-	-	sq-ft
	2	Design Infiltration Rate Recommended	0.000	-	-	-	-	-	-	-	-	-	in/hr
	3	Design Capture Volume Tributary to BMP	1,990	-	-	-	-	-	-	-	-	-	cubic-feet
	4	Is BMP Vegetated or Unvegetated?	Vegetated										unitless
	5	Is BMP Impermeably Lined or Unlined?	Lined										unitless
	6	Does BMP Have an Underdrain?	Underdrain										unitless
	7	Does BMP Utilize Standard or Specialized Media?	Standard										unitless
	8	Provided Surface Area	3,580										sq-ft
	9	Provided Surface Ponding Depth	12										inches
	10	Provided Soil Media Thickness	18										inches
	11	Provided Gravel Thickness (Total Thickness)	18										inches
	12	Underdrain Offset	3										inches
	13	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	1.00										inches
	14	Specialized Soil Media Filtration Rate											in/hr
	15	Specialized Soil Media Pore Space for Retention											unitless
	16	Specialized Soil Media Pore Space for Biofiltration											unitless
	17	Specialized Gravel Media Pore Space											unitless
Retention Calculations	18	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	19	Ponding Pore Space Available for Retention	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	unitless
	20	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	21	Gravel Pore Space Available for Retention (Above Underdrain)	0.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	22	Gravel Pore Space Available for Retention (Below Underdrain)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	23	Effective Retention Depth	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	24	Fraction of DCV Retained (Independent of Drawdown Time)	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	25	Calculated Retention Storage Drawdown Time	120	0	0	0	0	0	0	0	0	0	hours
	26	Efficacy of Retention Processes	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	27	Volume Retained by BMP (Considering Drawdown Time)	627	0	0	0	0	0	0	0	0	0	cubic-feet
	28	Design Capture Volume Remaining for Biofiltration	1,363	0	0	0	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	29	Max Hydromod Flow Rate through Underdrain	0.0506	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	cfs
	30	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	in/hr
	31	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	32	Soil Media Filtration Rate to be used for Sizing	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	in/hr
	33	Depth Biofiltered Over 6 Hour Storm	3.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	34	Ponding Pore Space Available for Biofiltration	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	35	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	36	Gravel Pore Space Available for Biofiltration (Above Underdrain)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	37	Effective Depth of Biofiltration Storage	21.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	38	Drawdown Time for Surface Ponding	20	0	0	0	0	0	0	0	0	0	hours
	39	Drawdown Time for Effective Biofiltration Depth	35	0	0	0	0	0	0	0	0	0	hours
	40	Total Depth Biofiltered	25.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	41	Option 1 - Biofilter 1.50 DCV: Target Volume	2,044	0	0	0	0	0	0	0	0	0	cubic-feet
	42	Option 1 - Provided Biofiltration Volume	2,044	0	0	0	0	0	0	0	0	0	cubic-feet
	43	Option 2 - Store 0.75 DCV: Target Volume	1,022	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Option 2 - Provided Storage Volume	1,022	0	0	0	0	0	0	0	0	0	cubic-feet
	45	Portion of Biofiltration Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	46	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	-	-	-	-	-	-	-	-	-	yes/no
	47	Overall Portion of Performance Standard Satisfied (BMP Efficacy Factor)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	48	**Deficit of Effectively Treated Stormwater**	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

No Warning Messages

8.0 General Requirements

- Completion of this attachment is required for all PDPs subject to hydromodification management requirements (see PDP SWQMP Form Table 5). Do not submit this attachment if exempt from Hydromodification Management requirements. Document the PDP exemption in Attachment 9.
- Submit this cover page and all required Sub-attachments for all structural hydromodification management BMPs proposed for the project.
- Constructed features must fully satisfy the requirements described in applicable BMPDM sections and appendices, and any other guidance identified by the County.
- DMA Exhibits and Construction Plans: DMAs, features, and BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.
- Structural BMP Certification. All structural hydromodification management BMPs documented this attachment must be certified by a registered engineer in Attachment 7, Sub-attachment 7.1.
- Structural BMP Verification. BMP installation must be verified by the County at the completion of construction. Applicants must complete an Installation Verification Form (Attachment 10).

Sub-attachments (check all that are completed)
☒ **8.1: Flow Control Facility Design** (required)[1] Submit using ☒ the Sub-attachment 8.1 cover sheet provided, or ☐ as a separate stand-alone document labeled Sub-attachment 8.1.
☐ **8.2: Hydromodification Management Points of Compliance** (required) Complete the table provided in Sub-attachment 8.2.
8.3: Geomorphic Assessment of Receiving Channels 1. Has a geomorphic assessment been performed for the receiving channel(s)? ☒ No, the low flow threshold is 0.1Q2 (default low flow threshold)
☐ Yes (provide the information below): Low flow threshold: ☐ 0.1Q2 ☐ 0.3Q2 ☐ 0.5Q2
Title: Date: Preparer:
Submit using ☐ the Sub-attachment 8.3 cover sheet provided, or ☐ as a separate stand-alone document labeled Sub-attachment 8.3.
8.4: Vector Control Plan (required if BMPs will not drain in less than 96 hours) ☐ Included with this attachment ☒ Not required

[1] Including Structural BMP Drawdown Calculations and Overflow Design Summary. See BMPDM Chapter 6 and Appendix G for additional design guidance.

8.1 Flow Control Facility Design

Insert Flow Control Facility Design behind this cover page or submit as a separate stand-alone document labeled Sub-attachment 8.1.

BMP Sizing Spreadsheet V3.1

Project Name:	Valley View
Project Applicant:	REC Consultants
Jurisdiction:	San Diego County
Parcel (APN):	591-100-27 & 31
Hydrologic Unit:	
Rain Gauge:	Lindbergh
Total Project Area (sf):	77,535
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1			
Project Name:	Valley View	Hydrologic Unit:	0
Project Applicant:	REC Consultants	Rain Gauge:	Lindbergh
Jurisdiction:	San Diego County	Total Project Area:	77,535
Parcel (APN):	591-100-27 & 31	Low Flow Threshold:	0.1Q2
BMP Name:	BMP-1	BMP Type:	Biofiltration
BMP Native Soil Type:	C	BMP Infiltration Rate (in/hr):	0.1

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Surface Area	Surface Area (SF)
imp paving	43,485	C	Moderate	Concrete	1.0	0.05	2174
permeable	34,050	C	Moderate	Landscape	0.1	0.05	170
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	77,535					Minimum BMP Size	2345
						Proposed BMP Size*	3580

* Assumes standard configuration

Surface Ponding Depth	12.00	in
Bioretention Soil Media Depth	18.00	in
Filter Coarse	6.00	in
Gravel Storage Layer Depth	12	in
Underdrain Offset	3.0	in

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, May 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.1			
Project Name:	Valley View	Hydrologic Unit:	0
Project Applicant:	REC Consultants	Rain Gauge:	Lindbergh
Jurisdiction:	San Diego County	Total Project Area:	77,535
Parcel (APN):	591-100-27 & 31	Low Flow Threshold:	0.1Q2
BMP Name	BMP-1	BMP Type:	Biofiltration

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
imp paving	Lindbergh	C	Moderate	0.349	0.998	0.035	**0.50**
permeable	Lindbergh	C	Moderate	0.349	0.782	0.027	**0.39**

3.75	**0.062**	**0.89**	**1.06**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

0.051	**0.055**	**0.79**	**1.000**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	13.6

8.2 Hydromodification Management Points of Compliance

- List and describe all points of compliance (POCs) for flow control for hydromodification management.
- For each POC, provide a POC identification name or number, and a receiving channel identification name or number correlating to the project's HMP Exhibit (see Attachment 2).

POC name or #	Channel name or #	POC Description
1	1	Existing Natural Creek

8.3 Geomorphic Assessment of Receiving Water Channels

Insert Geomorphic Assessment behind this cover page or submit as a separate stand-alone document labeled Sub-attachment 8.3.

8.4 Vector Control Plan

Insert Vector Control Plan behind this cover page or submit as a separate stand-alone document labeled Sub-attachment 8.4.

9.0 General Requirements

- Complete the table below to indicate which compliance pathway was selected in PDP SWQMP Table 6. Include the corresponding sub-attachment with your SWQMP submittal. Other sub-attachments do not need to be included.
- See the BMPDM sections and appendices listed under "BMPDM Design Resources" for additional explanation of design requirements. Constructed features must fully satisfy the requirements described in these resources, and any other guidance identified by the County.
- DMA Exhibits and Construction Plans: CCSYAs and applicable BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.

Sub-attachments	BMPDM Design Resources
☐ **9.1: Documentation of Hydromodification Management Exemption**[1]	Section 1.6
☒ **9.2: Watershed Management Area Analysis (WMAA) Mapping**[1]	Appendix H.1.1.2
☐ **9.3: Resource Protection Ordinance (RPO) Methods**	Appendix H.1.1.1
☐ **9.4: No Net Impact Analysis**	Appendix H.4

[1] The San Diego County Regional comprehensive WMAA mapping data can be found on the Project Clean Water website here: http://www.projectcleanwater.org/download/wmaa_attc_data/

9.1 Documentation of Hydromodification Management Exemption (BMPDM Section 1.6)

- If the PDP is exempt from hydromodification management requirements (see Table 4 Part A.1 of the PDP SWQMP), use this Sub-attachment to document the exemption.
- Select the type of exemption below that applies and provide an explanation of the selection, including maps or other applicable documentation. Additional documentation may be requested by County staff.

Exemption Type per BMPDM Figure 1-2 (select one)
☐ a. The proposed project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
☐ b. The proposed project will discharge runoff directly to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
☐ c. The proposed project will discharge runoff directly to an area identified by the County as appropriate for an exemption by the WMAA for the watershed in which the project resides[2].
Explanation (add or attach pages as necessary)

[2] This option must include an analysis of the project using the methodology presented in Attachment E of the Regional Watershed Management Area Analysis.

9.2 Watershed Management Area Analysis (WMAA) Mapping (BMPDM Appendix H.1.1.2)

Watershed Management Area Analysis (WMAA) mapping is a simple way to screen projects to determine the presence of onsite or offsite upstream Potential Critical Coarse Sediment Yield Areas (PCCSYAs). The San Diego County Regional WMAA mapping data can be found on the Project Clean Water website here: http://www.projectcleanwater.org/download/wmaa_attc_data/ .[3]

- Based on the WMAA map and the proposed project design, demonstrate below that both of the following conditions apply to the PDP:

  (a) Less than 5% of PCCSYAs will be impacted (built on or obstructed) by the PDP, and

  (b) All upstream offsite PCCYSAs will be bypassed (see BMPDM Appendix H.3).

A. Mapping Results -- At a minimum, show: (1) the project footprint, (2) areas of proposed development, (3) impacted onsite PCCSYAs, (4) offsite tributary areas[4], and (5) bypass of upstream offsite PCCSYAs.

See attached exhibit – there are no PCCSYA within the project area.

[3] Applicants may refine initial mapping results using options identified in BMPDM Appendix H.1.2.

[4] Tributary areas must be shown to demonstrate that upstream offsite PCCSYAs do not exist. If bypassing these areas, only the bypass should be shown.

B. Explanation -- Provide documentation as needed to demonstrate that (1) impacts to PCCSYAs are below 5%, and (2) upstream offsite PCCYSAs are effectively bypassed. Add pages as necessary.

9.3 Resource Protection Ordinance (RPO) Methods (BMPDM Appendix H.1.1.1)

- Either of two Resource Protection Ordinance (RPO) methods may also be used to demonstrate compliance with CCSYA requirements. Select either option and document the selection below:

☐ **RPO Scenario 1: PDP is subject to and in compliance with RPO requirements**[5]

- **Select** if the project requires one or more discretionary permits;
- **Demonstrate** that onsite AND upstream offsite CCSYAs will be avoided and/or bypassed.

☐ **RPO Scenario 2: PDP is entirely exempt/not subject to RPO requirements**[6]

- **Select** if the project does not require discretionary permits;
- **Demonstrate** that all upstream offsite CCSYAs will be bypassed[7].

A. Mapping Results -- At a minimum, show as applicable: (1) the project footprint, (2) areas of proposed development, (3) locations of onsite and upstream offsite CCSYAs, and (4) bypass of all identified CCSYAs.

[5] RPO applicability is normally confirmed during discretionary review. Check with your project manager if you're not sure of your status.
[6] Does not include PDPs utilizing exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3).
[7] This scenario does not impose requirements for onsite CCSYAs.


WMAA/PCCSYA EXHIBIT
VALLEY VIEW
Legend
3410 Valley Rd
Yes
Valley Rd
Filipino American Hwy
54
Reo Dr
Park Bonita Apartments
San Miguel Ct
Valley Rd
Cagle St
Stockman St
Plaza Bonita Centerway
Rancho Escondido
Omacitas Ln
Sweetwater Heights Park
PMR
3410 Valley Rd
Lomacitas Ln
Victory Bee Removal
Bonita Valley Seventh-day Adventist...
Sweetwater Rd
Google Earth
1000 ft
N

B. Explanation -- Provide documentation as needed to demonstrate that (1) onsite CCSYAs are avoided and bypassed [if applicable], and (2) upstream offsite CCYSAs are effectively bypassed. Add pages as necessary.

9.4 No Net Impact Analysis (BMPDM Appendix H.4)

- When impacts to CCSYAs cannot be avoided or effectively bypassed, applicants must demonstrate that their project generates no net impact to the receiving water per the performance metrics identified in BMPDM Appendix H.4.
- Use the space below to document that the PDP will generate no net impact to any receiving water.

No Net Impact Analysis (add or attach pages as necessary)

This form must be accepted by the County prior to the release of construction permits or granting of occupancy for applicable portions of a Priority Development Project (PDP). Its purpose is to provide documentation of the final installation of permanent Best Management Practices (BMPs) used to satisfy Structural Performance Standards for the development project. Compliance with these standards reduces the discharge of pollutants and flows from the completed project site. Applicable standards may be satisfied using Structural BMPs (S-BMPs), Significant Site Design BMPs (SSD-BMPs), or both. Applicants are responsible for providing all requested information.

PART 1 PROJECT INFORMATION

A. Project Summary Information	
Project Name	Valley View
Record ID (e.g. grading/improvement plan number, building permit)	TBD
Project Address	3410 Valley Rd. Bonita, CA
Assessor's Parcel Number(s) APN(s)	591-100-27 & 31
Project Watershed (Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Sweetwater HU, Lower Sweetwater HA, La Nacion HAS, 909.12
B. Owner Information	
Name	Arturo Valdez
Address	Valley View Development, LLC.
Email Address	2577 University Ave.
Phone Number	619-942-1915

COUNTY – OFFICIAL USE ONLY	
INTAKE ID#	
ACCEPTANCE ID#	

****THIS PAGE IS FOR PARTIAL VERIFICATIONS ONLY ****

If final grade release or granting of occupancy is being requested for only a portion of the Priority Development Project (PDP) please fill out the table below. Include ALL of the Structural BMPs and/or Significant Site Design BMPs for the entire project in the table. **Include a mark-up of the DMA map from the approved SWQMP with this Verification package that clearly shows which DMAs you are submitting for approval and which DMAs have already been accepted (if any).**

DMA #	APN or Lot #	BMP ID #	WPP Acceptance Date (If applicable)	WPP Acceptance ID# (If applicable, e.g. 20/21-001)

PART 2 BMP INVENTORY INFORMATION

Use this table to document Structural BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) for the PDP. All DMAs that are not self-mitigating or de minimis must have at least one Structural BMP or Significant Site Design BMP.

- In **Part A** list all Structural BMPs (including both Pollutant Control and/or Hydromodification as applicable) by DMA.
- Complete **Part B** for all DMAs that contain only Significant Site Design BMPs. SSD-BMPs are Site Design BMPs (SD-BMPs) that are sized and constructed to satisfy Structural Performance Standards for a DMA.
- The information provided for each BMP in the table must match that provided in the Stormwater Quality Management Plan (SWQMP), construction plans, maintenance agreements, and other relevant project documentation.

DMA #	BMP Information			Maintenance Category (1, 2, 3, or 4)	Maintenance Agreement Recorded DOC #	Construction Plan Sheet #	Landscape Plan Sheet #	FOR DPW-WPP USE ONLY
	Quantity	Description/Type of Structural BMP	BMP ID #					
A. Structural BMPs (S-BMPs)								
Add rows as needed. Click into the last column in the row below this, then press TAB to add a new row.								
B. Significant Site Design BMPs (SSD-BMPs)								
		Choose an item.		Choose				
		Choose an item.		Choose				
		Choose an item.		Choose				
		Choose an item.		Choose				
		Choose an item.		Choose				
		Choose an item.		Choose				
Add rows as needed. Click into the last column in the row below this, then press TAB to add a new row.								

PART 3 REQUIRED ATTACHMENTS

For the permanent BMPs listed in Part 2, submit the following to the County inspector along with this Verification form as a package (check all that are attached):

☐ **PHOTOGRAPHS:** Final construction photos of every permanent BMP listed in Part 2 are required. Final photos must be recent and be labeled with the date and a BMP Identifier. Additional photographs illustrating proper construction of the BMPs are recommended to be included and may be requested by WPP prior to acceptance of this Verification (e.g. excavation depths, liners, hydromodification orifices, Biofiltration Soil Media (BSM), vegetation, mulch).

☐ **MAINTENANCE AGREEMENTS:** Copies of approved and recorded Storm Water Maintenance Agreements (SWMA), Category 1 Maintenance Notification Agreements (MN), or Encroachment Maintenance and Removal Agreements (EMRA) for all S-BMPs.

Note: Significant Site Design (SSD) BMPs and most Category 4 BMPs do not require recorded maintenance agreements.

☐ **CONSTRUCTION PLANS:** Submit electronic and/or 11" X 17" hard copies of the current approved Construction Plan sheets for the Record ID(s) listed on Page 1:

- ☐ Grading Plans
- ☐ Improvement Plans
- ☐ Precise Grading Plan
- ☐ Building Plan (Applicable BMP Sheets only)
- ☐ Other (Please specify) _____

For each Construction Plan, the sheets submitted must incorporate all of the following:

- A BMP Table on Sheet 1, AND
- A plan detail cross-section of each verified as-built BMP, AND
- The location of each verified as-built BMP

☐ **LANDSCAPE PLANS**: If the PDP includes vegetated BMPs and has a Landscape Plan, submit the following:

- ☐ Final Landscape Plans
- ☐ Proof of Irrigation Installed (if applicable)

PART 4 PREPARER'S CERTIFICATION

By signing below, I certify that the BMP(s) listed in Part 2 of this Verification Form have been constructed and are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Note: Structural BMPs must be certified by a licensed professional engineer.

Please sign and, if applicable, provide your seal below.

Preparer's Name:	
Email Address:	
Phone Number:	
Preparer's Signature:	
Date:	

[SEAL]

PROJECT RECORD ID: _____

COUNTY - OFFICIAL USE ONLY

County Inspector Approval:

***NOTE: The County approved SWQMP document and any Addendums or Revisions must be included with this BMP Installation Verification submittal package.**

- ☐ DPW Private Development Construction Inspection (PDCI)
- ☐ PDS Building
- ☐ DGS
- ☐ DPR

By signing below, the County Inspector concurs that every BMP listed in Part 2 of this BMP Installation Verification form has been installed per plan.

Inspector Name: _____

Inspector's Signature: _____ Date: _____

DPW Watershed Protection Program (WPP) Acceptance:

Date Received: _____

WPP Reviewer: _____

WPP Reviewer concurs that the BMPs accepted in **Part 2** above may be entered into County inventory.

WPP Reviewer's Signature: _____ Date: _____

Enter Acceptance ID# on page 1.

NOTES: