STORM WATER MANAGEMENT PLAN FOR PRIORITY PROJECTS (MAJOR SWMP) FOR MEADOWOOD VESTING TENTATIVE MAP (VTM)

Job Number 15956
April 1, 2009
Revised: August 18, 2009

RICK ENGINEERING COMPANY

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rickengineering.com

STORM WATER MANAGEMENT PLAN

FOR

PRIORITY PROJECTS (MAJOR SWMP)

FOR MEADOWOOD VESTING TENTATIVE MAP (VTM)

Job Number 15956

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July 22, 2009

Rick Engineering Company has reviewed the County of San Diego's plancheck comments for the April 1, 2009 report titled "Storm Water Management Plan for Priority Projects (Major SWMP) for Meadowood Vesting Tentative Map (VTM)". The following text is the County's plancheck comments (in italicized lettering), immediately followed by Rick Engineering Company's responses (in bold lettering).

1. *The pre-project drainage maps provided in the Meadowood Drainage Study show distinct discharge points for Drainage Basins 500, 600, and 700A/700B. For evaluating compliance with HMP regulations, it does not appear to be reasonable to combine Drainage Basins 500, 600, and 700A into a single basin, resulting in a single Point of Compliance (POC) for these basins. Instead, separate POCs are required for each of these drainage basins, as described below.*

   Drainage Basin 500. Most of the flow from Drainage Basin 500 appears to join a small tributary to Horse Ranch Creek (within the triangular area shown on the drainage maps along the western edge of the property). The approximate POC recommended for Drainage Basin 500 is shown in Figure 1.

   Drainage Basin 600. Most of the flow from Drainage Basin 600 leaves the basin at a single discharge point. The approximate POC recommended for Drainage Basin 600 is shown in Figure 1.

   Drainage Basins 700A and 700B. As outlined in the County's comments regarding the Meadowood Drainage Study, the delineation of Drainage Basins 700A and 700B requires reexamination. Drainage Basin 700A is currently modeled with an outlet at Node 712, while flow from Drainage Basin 700B discharges at Node 753 (see Figure 2). However, it appears from the Pre-Project Drainage Map (dated November 14, 2008) that much of the flow from 700A would actually combine with flow from 700B, with the combined flow discharging at Node 753. Therefore, a single POC could potentially be used for these two drainage basins unless significant flow actually reaches Node 712. In the latter case, two POCs would be required: at Node 753 and Node 712.

   Rick Engineering Company's Response: See Hydromodification Management Study for the response to this comment.

2. *All Point of Compliance locations should be clearly labeled on the Water Quality and Hydromodification Management Exhibit.*

   Rick Engineering Company's Response: Comment noted and the Water Quality and Hydromodification management Exhibit has been updated exhibits have been updated.

3. *Please revise the Water Quality and Hydromodification Management Exhibit to show the correct boundary between basins 8000A and 8000B on the east side of Horse Ranch Creek Road (i.e., it should be consistent with the Proposed Pond Locations Exhibit).*

   Rick Engineering Company's Response: Comment noted and the Water Quality and Hydromodification management Exhibit has been updated exhibits have been updated.

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INTRODUCTION

The format of this Storm Water Management Plan (SWMP) is based on Appendix C of the March 24, 2008 County of San Diego *Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects*. However, where appropriate, Rick Engineering Company has elaborated and provided additional information.

A Major SWMP must be completed in its entirety and accompany applications to the County for a permit or approval associated with certain types of development projects. This SWMP is for the Meadowood Vesting Tentative Map and the offsite improvements. For project information please see the project description following this section.

Project Name:	**Meadowood Vesting Tentative Map**
Permit Number (Land Development Projects):	VTM 5354RPL 4
Work Authorization Number (**CIP only**):	N/A
Applicant:	Pardee Homes
Applicant's Address:	6025 Edgewood Ridge Court, SD CA 92130
Plan Prepared By:	Rick Engineering Company
Date:	July 22, 2009
Revision Date (If applicable):	N/A

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance Number 9424 (WPO), requires all applications for a permit or approval associated with a Land Disturbance Activity to be accompanied by a Storm Water Management Plan (SWMP) (section 67.806.b). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority development project are required to prepare a Major SWMP. It has been determined that the Meadowood Vesting Tentative Map meets this criteria and as a result will prepare a Major SWMP.

Since this SWMP is a living document, revisions may be necessary during various stages of approval by the County. The following is a record of changes to this document.

Project Stages	Does the SWMP need revisions?		If YES, Provide Revision Date
First Submittal (April 1, 2009)	--	--	---
Second Submittal (July 22, 2009)	No		

PROJECT DESCRIPTION

The proposed Meadowood Vesting Tentative Map (VTM) project is located east of Highway 15, north of Pala Road (State Route 76), within the County of San Diego, California. The project is approximately 389.5 acres in size and will consist of 844 dwelling units, a future school site (for the purposes of the VTM this area is a mass graded pad), park and recreation areas, preservation of existing orchards and natural open spaces, and a sewer treatment plant. Outdoor uses will include open spaces, parks, sidewalks, and trails. In addition, offsite improvements associated with Pala Mesa Heights Drive, Horse Ranch Creek Road, Pala Mesa Drive/existing Pankey Road and Street R are also associated with this project. As such, this is considered a priority project. Refer to Attachment A for the Vicinity Map depicting the project location.

The existing project site consists primarily of natural terrain and orchards. A ridge exists on the eastern half of the site, which splits the existing runoff to the east and west. The proposed development footprint of this project is entirely within the western portion of the site, where the natural grade directs runoff west towards Horse Ranch Creek. Horse Ranch Creek flows north to south and is adjacent to Highway 15. Once the project runoff confluences with Horse Ranch Creek, the flows are conveyed in a southerly direction, crosses State Route 76, confluences with the San Luis Rey River, and ultimately outfalls into the Pacific Ocean.

This project will provide infrastructure to the proposed development including public and private streets, wet and dry utilities, public and private storm drain facilities and developable pads. The characteristics and density of this project are consistent with the Specific Plan Amendment and the General Plan Amendment proposed for this project. Proposed onsite public infrastructure also includes recycled water and domestic water reservoirs, water and sewer mains, and a sewer treatment plant. The sewer treatment plant is a part of a major use permit that is separate from the Meadowood VTM. Therefore, this document does not address the water quality associated with the plant, however it does address the water quality of the surrounding area associated with Drainage Basin 9000.

In addition to the offsite improvements, the project has been divided into 7 major on-site post-project drainage basins that have been identified in this report. The on-site drainage basins, from north to south, are referred to as Drainage Basin 1000, 2000 (within Drainage Basin 2000 there are two sub basins identified as 2000A and 2000B), 3000, 4000, 7000 (within Drainage Basin 7000 there are two sub basins identified as 7000A and 7000B), 8000 (within Drainage Basin 8000 there are two sub basins identified as 8000A and 8000B), and 9000. The subbasins that were combined into Drainage Basins 2000, 7000, and 8000 were combined because they share common points of compliance (POC). All of the drainage basins, with the exception of Drainage Basins 1000, 2000, and 9000 are served by a water quality settling basin (refer to Attachment B). A settling basin was not proposed for Drainage Basin 1000 because there are no developed flows thus a treatment control best management practice (BMP) is not necessary. In the cases of Drainage Basins 2000 and 9000 water quality settling basins were not feasible, so BioClean Inlet Filter Inserts with a BioMEDIA Green Filters (High Rate Media Filters) are proposed for these basins (8 BioClean units for Drainage Basin 2000 and 2 BioClean units for

Drainage Basin 9000). Additionally, the grading associated with Drainage Basin 9000 will result in the adjustment of, in one case, and removal of, in the other, a vegetated swale associated with the SR-76. The swale that will be removed will be rebuilt, and will accept flows from a small portion of Drainage Basin 9000 in addition to the runoff it previously accepted from SR-76.

The six water quality settling basins (DB3, DB4, DB7A, DB7B, DB8A, and DB8B) and the ten BioClean Inlet Filter Inserts with BioMEDIA Green Filters have been numerically sized to treat the proposed developed watershed tributary to it. In addition, the six settling basins have also been designed to incorporate 100-year detention and hydromodification management. For the purposes of this report, these settling basins/100-year detention basins/ hydromodification management ponds will be referred to as "settling basins". While in the case of Drainage Basin 2000, a detention basin is proposed for hydromodification management, it has not been sized for water quality, so for the purposes of this report, it will not be considered to be one of the six settling basins. Also, the underground vaults associated with Drainage Basin 9000 are sized only for hydromodification management, so it will not be considered to be one of the six settling basins. For information regarding the detention basins and their design, please refer to the report titled, *Drainage Study for Meadowood Vesting Tentative Map*, dated July 22, 2009, prepared by Rick Engineering Company, herein referred to as the project's Drainage Study. For information regarding the hydromodification management ponds and their design, please refer to the report titled, *Hydromodification Management Study for Meadowood Vesting Tentative Map (VTM)*, dated July 22, 2009, prepared by Rick Engineering Company, herein referred to as the project's Hydromodification Management Study. The vegetated swales associated with the SR-76 that are being modified as a result of the Meadowood project have also been numerically sized to ensure proper treatment of the watersheds tributary to them.

Prior to the runoff entering the one of six settling basins and the ten BioClean Inlet Filter Inserts with a BioMEDIA Green Filter, the flows will be pre-treated utilizing a combination of Site Design, Source Control, and Low Impact Development Best Management Practices (BMPs). These BMPs are discussed in more detail in the following sections of this SWMP. These BMPs will help minimize the introduction of pollutants of concern from entering the receiving waters.

Based on a March 19, 2009 site visit, there was no evidence of dry weather flows observed in the canyons within the project limits or Horse Ranch Creek. However, there was evidence of a base flow in the portion of the San Luis Rey River adjacent to the project site.

The offsite improvements will encompass several areas associated with the future Pala Mesa Heights Drive, Horse Ranch Creek Road, Pala Mesa Drive/existing Pankey Road, and Street R. For all of the proposed inlets associated with these proposed improvements, BioClean Inlet Filter Inserts with a BioMEDIA Green Filters (High Rate Media Filters) will be installed.

PRIORITY DEVELOPMENT PROJECT DETERMINATION
The following table relates to the Meadowood Vesting Tentative Map

Table 1 – Priority Development Project

PRIORITY DEVELOPMENT PROJECT	YES	NO
Redevelopment that creates or adds at least 5,000 net square feet of additional impervious surface area		X
Residential development of more than 10 units	X	
Commercial developments with a land area for development of greater than 1 acre	X	
Heavy industrial development with a land area for development of greater than 1 acre		X
Automotive repair shop(s)		X
Restaurants, where the land area for development is greater than 5,000 square feet		X
Hillside development, in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 square feet or more of impervious surface	X	
Environmentally Sensitive Areas (ESA): All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.	X	
Parking Lots 5,000 square feet or more or with 15 parking spaces or more and potentially exposed to urban runoff	X	
Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater	X	
Retail Gasoline Outlets .(RGO) that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.		X

Limited Exclusion: Trenching and resurfacing work associated with utility projects are not considered Priority Development Projects. Parking lots, buildings and other structures associated with utility projects are subject to the WPO requirements if one or more of the criteria above are met.

The Meadowood Vesting Tentative Map has the following project categories: Attached and Detached Residential Development, Commercial Development 1 acre or greater, Hillside development more than 5,000 square feet, Parking Lots Streets, Highways, and Freeways. (Note: The area defined as a Commercial Development Priority Project Category is the future school site associated with Drainage Basin 7000B. The future school site is shown as a mass graded pad on the VTM. Upon completion of the grading, ownership of the mass graded pad will be transferred to the local school district. The local school district will be responsible to employ BMPs in accordance with the County's March 24, 2008 SUSMP requirements.)

HYDROMODIFICATION DETERMINATION

The following questions are relevant to hydromodification management issues for the Meadowood Vesting Tentative Map project.

Table 2 – Hydromodification Determination

	QUESTIONS	YES	NO	Information
1.	Will the proposed project disturb 50 or more acres of land? (Including all phases of development)	X		If YES, continue to 2. If NO, go to 6.
2.	Would the project site discharge directly into channels that are concrete-lined or significantly hardened such as with rip-rap, sackcrete, etc, downstream to their outfall into bays or the ocean?		X	If NO, continue to 3. If YES, go to 6.
3.	Would the project site discharge directly into underground storm drains discharging directly to bays or the ocean?		X	If NO, continue to 4. If YES, go to 6.
4.	Would the project site discharge directly to a channel (lined or un-lined) and the combined impervious surfaces downstream from the project site to discharge at the ocean or bay are 70% or greater?		X	If NO, continue to 5. If YES, go to 6.
5.	Project is required to manage hydromodification impacts.	X		Hydromodification Management Required as described in Section 67.812 b(4) of the WPO.
6.	Project is not required to manage hydromodification impacts.			Hydromodification Exempt. Keep on file.

The project is disturbing 50 or more acres of land and does not propose discharging directly into channels that are concrete-lined or significantly hardened. Also the project is not discharging directly into an underground storm drain system which discharges directly into a bay or the ocean thus further determining that this project is subject to incorporate hydromodification management devices. As mentioned previously, this project has six settling basins for water quality, however incorporated into the design of each of the six on-site settling basins is the required volume for hydromodification management ("hydromodification management ponds") and 100-year detention ("detention basins"). In addition, while the detention basin in Drainage Basin 2000, and the underground detention vaults within Drainage Basin 9000 are not utilized for water quality, they are designed with the required volume for hydromodification

management ("hydromodification management ponds") and 100-year detention ("detention basins"). Refer to the project's Hydromodification Management Study and Drainage Study for detailed information regarding the design of the Hydromodification Management "ponds" and the 100-year "detention basins".

STORM WATER QUALITY DETERMINATION

The following questions are relevant to collecting information pertaining to the Meadowood VTM Storm Water quality issues. Immediately following this table is text that provides information for each of these questions.

Table 3 – Storm Water Quality Determination

	QUESTIONS	COMPLETED	NA
1.	Describe the topography of the project area.	X	
2.	Describe the local land use within the project area and adjacent areas.	X	
3.	Evaluate the presence of dry weather flow.	X	
4.	Determine the receiving waters that may be affected by the project throughout all phases of development through completion (i.e., construction, long-term maintenance and operation).	X	
5.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	X	
6.	Determine if there are any High Risk Areas (which is defined by the presence of municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits.	X	
7.	Determine the Regional Board special requirements, including TMDLs, effluent limits, etc.	X	
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.		
9.	Determine the soil classification, permeability, erodibility, and depth to groundwater for Treatment BMP consideration.	X	
10.	Determine contaminated or hazardous soils within the project area.	X	
11.	Determine if this project is within the environmentally sensitive areas as defined on the maps in Appendix A of the *County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects.*	X	
12.	Determine if this is an emergency project.	X	

The proposed Meadowood VTM project is located east of Highway 15, north of Pala Road (State Route 76), within the County of San Diego, California. The project is approximately 389.5 acres in size and will consist of 844 dwelling units, a future school site (for the purposes of the VTM this area is a mass graded pad), park and recreation areas, preservation of existing orchards and natural open spaces, and a sewer treatment plant. Outdoor uses will include open spaces, parks, sidewalks, and trails. In addition, offsite improvements associated with Pala Mesa Heights Drive, Horse Ranch Creek Road, Pala Mesa Drive/existing Pankey Road and Street R are also associated with this project. The surrounding area is undeveloped and characterized by natural terrain that contains hills and some steep slopes with native vegetation and existing orchards. The general climate of the area is rather dry with only an average of 16 inches of rainfall annually.

Based on a March 19, 2009 site visit there was no evidence of dry weather flows observed in the canyons within the project limits or Horse Ranch Creek. However, there was evidence of a base flow in the portion of the San Luis Rey River adjacent to the project site.

The project's development footprint is located in the San Diego Region, within the San Luis Rey Hydrologic Unit, within the Lower San Luis Hydrologic Area, within the Bonsall Hydrologic Sub Area. Runoff from this project drains into Horse Ranch Creek that eventually drains to the San Luis Rey River and into the Pacific Ocean. Both of these receiving waters have the potential to be affected by the project throughout all phases of development, however steps are being taken to remove this risk. Prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared and a Notice of Intent must be submitted to the State Water Resources Control Board for coverage. This SWPPP will describe activities that must take place during construction to reduce pollutants from exiting the site. Adhering to the SWPPP should help to reduce the affect on receiving waters during construction. After construction, Post-Construction Best Management Practices (BMPs) will be in place (Site Design BMPs, Source Control BMPs, Low Impact Development practices, and Treatment Control BMPs are discussed in detail in the next sections of this text). All of these BMPs should help to reduce the affect on receiving waters during and after construction.

The project directly discharges into Horse Ranch Creek. Ultimately Horse Ranch Creek confluences with the San Luis Rey River. The lower 13 miles of the San Luis Rey River and the Pacific Ocean shoreline at the San Luis Rey River are listed on the 2006 CWA Section 303(d) *List of Water Quality Limited Segments Requiring TMDLS*. The lower 13 miles of the San Luis Rey River is impaired for chloride and Total Dissolved Solids (TDS). Chloride and TDS levels usually occur from quantities of urban runoff/storm sewers being introduced into water systems. The Pacific Ocean Shoreline at the San Luis Rey River is impaired for bacteria. Bacterial levels usually occur from animal wastes. While there is a 303(d) listed impaired water body downstream of the site (San Luis Rey River), the project does not directly discharge to it, nor should this project contribute to the impairment of the San Luis Rey River due to the proposed on-site BMPs.

Currently the receiving waters are not listed by the Regional Board as a water body with total maximum daily load requirements (TMDLs). In addition, the project does not fall within but is adjacent to an environmentally sensitive area as defined on the map located in Appendix A of the County of San Diego *Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects*.

The project site mainly consists of Type B, C, and D soils. The depth to groundwater for the northern portion of the project (Drainage Basins 1000, 2000, 3000, 4000, 7000A, and 7000B) ranges from 12 to 18 feet. The depth to groundwater for the southern portion of the project (Drainage Basins 8000A and 8000B) range from 6 to 9 feet. Throughout the Meadowood project, no contaminated or hazardous soils were encountered.

Based on analyses performed by the project's Geotechnical Engineer, it has been determined the majority of this project is not suitable for infiltration. In fact, the southern portion of this project consists of poor soils, underlying hard granitic rock, and areas that are prone to liquefaction. For the northern portion of this project, infiltration BMPs were not possible based on the Geotechnical Engineer's findings. Due to the severity of the poor soils in the southern area (Drainage Basin 8000A and 8000B), the project is completely removing and replacing the existing poor soils with material that has an equivalent infiltration rate equal to 1 inch per hour. As such, the infiltration BMPs (Hydromodification Management and LID devices) could be utilized in the southern portion (Drainage Basin 8000A and 8000B) of the Meadowood Project.

The project site does not include any municipal or domestic water supply reservoirs or groundwater percolation facilities. Because of this, it can be said that the project site does not contain any High Risk Areas. Nor is this project an emergency project.

WATERSHED

The development footprint associated with the Meadowood Vesting Tentative Map is located in Hydrologic Unit 903.12.

Number	Name
900.00	San Diego Region
903.00	San Luis Rey Hydrologic Unit
903.10	Lower San Luis Hydrologic Area
903.12	Bonsall Hydrologic Subarea

The following information was obtained from the September 8, 1994 (with amendments effective prior to April 25, 2007) Water Quality Control Plan for the San Diego Basin:

SURFACE WATERS	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Inland Surface Waters																
San Luis Rey River	903.12	*	X	X					X	X	X	X		X	X	
Ground Waters																
Lower San Luis	903.10	X	X	X												

*** Excepted from Municipal**
X Existing Beneficial Use.
0 Potential Beneficial Use

There are two watersheds within the Meadowood project boundary. The watershed to the east of the ridgeline that bisects the project is identified within the San Diego Region, within the San Luis Rey Hydrologic Unit, within the Monserate Hydrologic Area with the Pala Hydrologic Subarea (903.21). Approximately 71 acres within the Meadowood project boundary falls within this Hydrologic Unit 903.21. This area is to remain undisturbed preserving all existing drainage patterns. The remaining area of the property (west of the ridge), that is being developed, is located within the San Diego Region, within the San Luis Rey Hydrologic Unit, within the Lower San Luis Hydrologic Area, within the Bonsall Hydrologic Subarea (903.12). Therefore, because the developable footprint is only contained within one watershed, for the purposes of this SWMP only Hydrologic Unit 903.12 has been discussed in detail.

POLLUTANTS OF CONCERN

Using Table 4, the anticipated and potential pollutants to be generated from the proposed priority project categories for the Meadowood VTM (see highlighted rows) have been identified. Pollutants associated with any hazardous material sites that have been mediated or are not threatened by the proposed project are not considered a pollutant of concern. These types of hazardous pollutants are not anticipated for the Meadowood VTM project.

Table 4. Anticipated and Potential Pollutants Generated by Land Use Type

	General Pollutant Categories								
PDP Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development 1 acre or greater	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Heavy industry /industrial development	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 sq. ft.	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated

P = potential

(1) A potential pollutant if landscaping exists on-site.
(2) (2) A potential pollutant if the project includes uncovered parking areas.
(3) (3) A potential pollutant if land use involves food or animal waste products.
(4) (4) Including petroleum hydrocarbons.
(5) (5) Including solvents.

Currently there is no monitoring data available that is relevant to the project. If this becomes available, the information can be inserted into Attachment C.

(Note: The area defined as a Commercial Development Priority Project Category is the future school site associated with Drainage Basin 7000B. The Meadowood Project is mass grading the area associated with the future school site. Upon completion of the grading, ownership of the mass graded pad will be transferred to the local school district. The local school district will be responsible to employ BMPs in accordance with the County's March 24, 2008 SUSMP requirements.)

CONSTRUCTION BMPs

The construction BMPs that may be implemented during construction of the Meadowood VTM project are as follows:

- ☑ Silt Fence
- ☑ Fiber Rolls
- ☑ Street Sweeping and Vacuuming
- ☑ Storm Drain Inlet Protection
- ☑ Stockpile Management
- ☑ Solid Waste Management
- ☑ Stabilized Construction Entrance/Exit Dewatering Operations
- ☑ Vehicle and Equipment Maintenance
- ☑ Desilting Basin
- ☑ Gravel Bag Berm
- ☑ Sandbag Barrier
- ☑ Material Delivery and Storage
- ☑ Spill Prevention and Control
- ☑ Concrete Waste Management
- ☑ Water Conservation Practices
- ☑ Paving and Grinding Operations
- ☑ Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

The project site is greater than 1 acre and therefore will be subject to the requirements of the State Water Resources Control Board (SWRCB) Order No. 99-08-DWQ National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 (herein "General Construction Permit"), or a future SWRCB Order reissuing the General Construction Permit. For coverage by the General Construction Permit, the project owner is required to submit to the SWRCB a Notice of Intent (NOI) to comply with the General Construction Permit, and develop a Storm Water Pollution Prevention Plan (SWPPP) describing best management practices (BMPs) to be used during and after construction to prevent the discharge of sediment and other pollutants in storm water runoff from the project.

A site specified SWPPP has not been completed for the Meadowood VTM at this time. However, one will be developed prior to construction. Site-specific temporary construction BMPs must be described in the SWPPP for the project. Typical temporary BMPs that may be used during construction include good housekeeping practices and erosion and sediment control measures. Good housekeeping practices include practices such as street sweeping, waste disposal, vehicle and equipment maintenance, concrete washout area, materials storage, minimization of hazardous materials and proper handling and storage of hazardous materials. Typical erosion and sediment control measures include silt fences, fiber rolls, gravel bags, temporary desilting basins, velocity check dams, temporary ditches or swales, storm water inlet protection, soil stabilization measures such as erosion control mats, tackifier, or hydroseed, and other measures. Construction BMPs for this project must be selected, constructed, and maintained so as to comply with all applicable ordinances and guidance documents.

In the event that the project is constructed in phases, the project owner shall be responsible for long term soil stabilization measures and maintenance of the soil stabilization.

EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

The checklist below is to determine if the proposed Meadowood VTM project will pose an "exceptional threat to water quality," and therefore require Advanced Treatment Best Management Practices.

Table 5 – Exceptional Threat to Water Quality Determination

No.	CRITERIA	YES	NO	INFORMATION
1.	Is all or part of the proposed project site within 200 feet of waters named on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity? Current 303d list may be obtained from the following site: http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqt mdls.pdf	X		If YES, continue to 2. If NO, go to 5.
2.	Will the project disturb more than 5 acres, including all phases of the development?	X		If YES, continue to 3. If NO, go to 5.
3.	Will the project disturb slopes that are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and that drain toward the 303(d) listed receiving water for sedimentation and/or turbidity?		X	If YES, continue to 4. If NO, go to 5.
4.	Will the project disturb soils with a predominance of USDA-NRCS Erosion factors kf greater than or equal to 0.4?			If YES, continue to 6. If NO, go to 5.
5.	Project is not required to use Advanced Treatment BMPs.	X		Document for Project Files by referencing this checklist.
6.	Project poses an "exceptional threat to water quality" and is required to use Advanced Treatment BMPs.		X	Advanced Treatment BMPs must be consistent with WPO Section 67.811(b)(20)(D) performance criteria

Based on this table, the project is not required to utilize Advanced Treatment BMPs.

SITE DESIGN

To minimize storm water impacts, site design measures must be addressed for the Meadowood VTM. The following checklist provides options for avoiding or reducing potential impacts during project planning. If YES is checked, the measure was used for this project. Where appropriate, Rick Engineering Company has provided additional information in italics.

Table 6 Site Design

	OPTIONS	YES	NO	N/A
1.	Has the project been located and road improvements aligned to avoid or minimize impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	X		
2.	Is the project designed to minimize impervious footprint? *The project boundary is 389.5 acres and the development footprint is 218 acres. Only 56 percent of the project site is being developed.*	X		
3.	Is the project conserving natural areas where feasible? *The project boundary is 389.5 acres and the development footprint is 218 acres. Only 56 percent of the project site is being developed.*	X		
4.	Where landscape is proposed, are rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping? *For the northern portion of the project (all of the single family development), all of the individual pads have been designed to convey flows throughout the landscaping and the roof drains are not directly connected to the storm drain system. In addition, this portion of the project has non-contiguous sidewalks, thus allowing impervious area to be conveyed over the pervious parkway. For the southern portion of the project (Drainage Basins 8000A and 8000B), the same Site Design BMPs are implemented in addition to the installation of porous driveways on each pad.*	X		
5.	For roadway projects, are structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	X		
6.	Can any of the following methods be utilized to minimize erosion from slopes:			
6.a.	Disturbing existing slopes only when necessary?	X		
6.b.	Minimize cut and fill areas to reduce slope lengths? *In general this is always done, however in some areas due to site constraints, this is not feasible, however the slopes are landscaped.*	X		
6.c.	Incorporating retaining walls to reduce steepness of slopes or to shorten slopes? *This has been proposed throughout the project where feasible.*	X		
6.d.	Providing benches or terraces on high cut and fill slopes to reduce concentration of flows? *This has been proposed throughout the project where feasible.*	X		
6.e.	Rounding and shaping slopes to reduce concentrated flow? *This has been proposed throughout the project where feasible.*	X		
6.f.	Collecting concentrated flows in stabilized drains and channels? *This has been proposed throughout the project where feasible.*	X		

LOW IMPACT DEVELOPMENT (LID)

Each numbered item below is a LID requirement of the WPO. Please check the box(s) under each number that best describes the Low Impact Development BMP(s) selected for this project. Where appropriate, Rick Engineering Company has provided additional information in italics.

Table 7 – Low Impact Development (LID)

1. Conserve natural Areas, Soils, and Vegetation-County LID Handbook 2.2.1
☐ Preserve well draining soils (Type A or B)
☑ Preserve Significant Trees *(See Attachment D)*
☐ Other. Description:
☐ 1. Not feasible. State Reason:
2. Minimize Disturbance to Natural Drainages-County LID Handbook 2.2.2
☐ Set-back development envelope from drainages
☑ Restrict heavy construction equipment access to planned green/open space areas
☐ Other. Description:
☐ 2. Not feasible. State Reason:
3. Minimize and Disconnect Impervious Surfaces (see 5) -County LID Handbook 2.2.3
☑ Clustered Lot Design
☑ Items checked in 5?
☐ Other. Description:
☐ 3. Not feasible. State Reason:
4. Minimize Soil Compaction-County LID Handbook 2.2.4
☑ Restrict heavy construction equipment access to planned green/open space areas
☐ Re-till soils compacted by construction vehicles/equipment
☐ Collect & re-use upper soil layers of development site containing organic materials
☐ Other. Description:
☐ 4. Not feasible. State Reason:
5. Drain Runoff from Impervious Surfaces to Pervious Areas-County LID Handbook 2.2.5

LID Street & Road Design
☑ Curb-cuts to landscaping
☑ Rural Swales *(Rural Swales are proposed for Horse Ranch Creek Road)*
☐ Concave Median
☐ Cul-de-sac Landscaping Design
☐ Other. Description:
LID Parking Lot Design
☐ Permeable Pavements
☑ Curb-cuts to landscaping *(Proposed for the multi-family development within Drainage Basin 7000A)*
☐ Other. Description:
LID Driveway, Sidewalk, Bike-path Design
☑ Permeable Pavements *(Only in Drainage Basin 8000A and 8000B)*
☐ Pitch pavements toward landscaping
☐ Other. Description:
LID Building Design
☐ Cisterns & Rain Barrels
☑ Downspout to swale
☐ Vegetated Roofs
☐ Other. Description:
LID Landscaping Design
☐ Soil Amendments
☐ Reuse of Native Soils
☑ Smart Irrigation Systems
☑ Street Trees
☐ Other. Description:
☐ 5. Not feasible. State Reason:

Significant LID measures have been incorporated into the design associated with the Meadowood VTM. Due to the poor soils the LID devices could not be specifically designed for infiltration, however incidental infiltration will occur. LID concepts associated with the northern portion of the project (Drainage Basins 2000, 3000, 4000, and 7000) have been summarized below:

- Each lot disperses the roof runoff through vegetated swale and/or landscaping prior to entering the storm drain system.

- All interior streets have non-contiguous sidewalks. The parkways will be vegetated thus allowing the runoff associated with the impervious sidewalk to be conveyed over the pervious parkway prior to entering the downstream storm drain.

- All of the developed runoff will enter a settling basin (DB3, DB4, DB7A, DB7B) prior to exiting the site that was been numerically sized with the exception of DB2. The settling basins will have vegetation, thus allowing for incidental infiltration.

Because of site constraints, it was not possible to incorporate a settling basin into Drainage Basin 2000. As a result, the LID concepts associated with this drainage basin are the same as for Drainage Basins 3000, 4000, and 7000 without the use of a settling basin.

Due to the soil mitigation that is proposed for the southern portion of the project (Drainage Basins 8000A and 8000B), the LID concepts are slightly different than those utilized in the north. The LID concepts associated with the southern portion of the project have been summarized below:

- Each lot disperses the roof runoff through a vegetated swale and/or landscaping.

- The runoff associated with each lot will be conveyed to a pervious driveway.

- All of the developed runoff (that does not infiltrate) will enter one of two settling basins (DB8A and DB8B) prior to exiting the site (the settling basin has been numerically sized). The settling basin will have vegetation, thus allowing for further infiltration.

Drainage Basin 9000 does not contain any residential units, so some of the LID concepts utilized for the other drainage basins could not be utilized. The underground vaults associated with Drainage Basin 9000 have not been numerically sized as settling basins or for 100-year detention, but have only been sized for hydromodification management, however Drainage Basin 9000 has utilized the following LID concepts:

- Horse Ranch Creek Road has non-contiguous sidewalks. The parkways and medians will be vegetated thus allowing the runoff associated with the impervious sidewalks and street to be conveyed over the pervious parkway or median prior to entering the downstream storm drain.

- Drainage associated with the SR-76 and small portions of the surrounding area will drain to numerically sized vegetated swales.

CHANNELS & DRAINAGES

The following checklist is to determine if the Meadowood VTM project includes work in channels.

Table 8 Channels and Drainages

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project include work in channels?	X			If YES go to 2 If NO go to 13.
2.	Will the project increase velocity or volume of downstream flow?	X			If YES go to 6.
3.	Will the project discharge to unlined channels?				If YES go to. 6.
4.	Will the project increase potential sediment load of downstream flow?				If YES go to 6.
5.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?				If YES go to 8.
6.	Review channel lining materials and design for stream bank erosion.	X			Continue to 7.
7.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	X			Continue to 8.
8.	Include, where appropriate, energy dissipation devices at culverts.	X			Continue to 9.
9.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	X			Continue to 10.
10.	Include, if appropriate, detention facilities to reduce peak discharges.	X			Continue to 11.
11.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.			X	Continue to 12.
12.	Provide other design principles that are comparable and equally effective.	X			Continue to 13.
13.	End	X			

Due to the potential that the proposed Meadowood project may impact downstream channels and drainages with respect to water quality and increasing the velocity or volume of runoff, several measures were proposed. The water quality BMPs/measure have been described in detail in this report (Site Design, Source Control, Low Impact development Devices, and Treatment Control BMPs). The hydromodification management measures ("ponds") and their design are discussed in detail in the project's Hydromodification Management Study.

SOURCE CONTROL

According to Table 9, obtained from the March 24, 2008 County of San Diego SUSMP, the Meadowood VTM has the following Individual Priority Project Categories: Private Roads, Residential Driveways & Guest Parking, Dock Areas, Maintenance Bays, Vehicle Wash Areas, Outdoor Processing Areas, Parking Areas, and Roadways, and Hillside Landscaping. However, it is not anticipated that the Meadowood VTM will contain any: Dock Areas, Maintenance Bays, Vehicle Wash Areas, or Outdoor Processing Areas.

Table 9 – Standard Storm Water BMP Selection Matrix

Priority Project Category	*Site Design BMPs*[1]	*Source Control BMPs*[2]	*Requirements Applicable to Individual Priority Project Categories*[3]										
			a. Private Roads	b. Residential Driveways & Guest Parking	c. Dock Areas	d. Maintenance Bays	e. Vehicle Wash Areas	f. Outdoor Processing Areas	g. Equipment Wash Areas	h. Parking Areas	i. Roadways	j. Fueling Areas	k. Hillside Landscaping
Detached Residential Development	R	R	R	R									R
Attached Residential Development	R	R	R	R									R
Commercial Development >1 Acre	R	R			R	R	R	R					
Heavy industry /industrial development	R	R	R		R	R	R	R	R			R	
Automotive Repair Shop	R	R			R	R	R		R			R	
Restaurants	R	R			R				R				
Hillside Development >5,000 ft^2	R	R	R										R
Parking Lots	R	R								R[4]			
Retail Gasoline Outlets	R	R				R	R					R	
Streets, Highways & Freeways	R	R									R		

R = Required; select one or more applicable and appropriate BMPs from the applicable steps in Section 4.1 & 4.2, or equivalent as identified in sections 4.6.1-4.6.3.
(1) Refer to Section 4.1.
(2) Refer to Section 4.2.
(3) Priority project categories must apply specific stormwater BMP requirements, where applicable. Projects are subject to the requirements of all priority project categories that apply.
(4) Applies if the paved area totals >5,000 square feet or with >15 parking spaces and is potentially exposed to urban runoff.

Table 9.1 is a checklist for Source Control BMPs for the Meadowood VTM. Where appropriate, additional text was added in italic lettering and unless otherwise stated in italic lettering, the answers within this table are directly related to the Detached Residential Development Priority Project Category. For information referring to the remaining Priority Project Categories, refer to the text immediately following Table 9.1.

Table 9.1- Source Control

BMP			YES	NO	N/A
1.	**Provide Storm Drain System Stenciling and Signage** *All storm drain inlets throughout the project will implement this Source Control BMP.*				
	1.a.	All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language (such as: "NO DUMPING – DRAINS TO _____") and/or graphical icons to discourage illegal dumping.	X		
	1.b.	Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.			X
2.	**Design Outdoors Material Storage Areas to Reduce Pollution Introduction** *Detached Residential Development is exempt from this requirement, however immediately following this table is additional information for the remaining priority project categories.*				
	2.a.	This is a detached single-family residential project. Therefore, personal storage areas are exempt from this requirement.	X		
	2.b.	Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.			X
	2.c.	The storage area shall be paved and sufficiently impervious to contain leaks and spills.			X
	2.d.	The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.			X
3.	**Design Trash Storage Areas to Reduce Pollution Introduction** *Detached Residential Development is exempt from this requirement, however immediately following this table is additional information for the remaining priority project categories.*				
	3.a.	Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,			X
	3.b.	Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.			X
4.	**Use Efficient Irrigation Systems & Landscape Design** *Throughout the project, efficient irrigation systems and landscape design will be implemented as a Source Control BMP.*				

	The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible.				
	4.a.	Employing rain shutoff devices to prevent irrigation after precipitation.	X		
	4.b.	Designing irrigation systems to each landscape area's specific water requirements.	X		
	4.c.	Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.	X		
	4.d.	Employing other comparable, equally effective, methods to reduce irrigation water runoff.	X		
5.	**Private Roads – Individual Priority Project Category** *All of the interior roads within the northern (Drainage Basin 2000, 3000, 4000, 7000A) portion of the project (associated with the detached residential development), with the exception of the multi-family development within Drainage Basin 7000A, are public roads. Therefore this individual priority project category does not apply. The interior roads within the southern portion of the project (Drainage Basins 8000A and 8000B) are private. The information presented in this section (Seciton5.a-5.d) is for the southern portion of the project that is detached residential development. The attached residential development (the multi-family development within Drainage Basin 7000A) is described in detail immediately following this table.*				
	The design of private roadway drainage shall use at least one of the following				
	5.a.	Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.			X
	5.b.	Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.			X
	5.c.	Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.			X
	5.d.	Other methods those are comparable and equally effective within the project. *For the southern portion of the project (the single family development), all of the individual pads have been designed to convey flows through the landscaping. The roof drains are not directly connected to the storm drain system but rather direct runoff over the landscaping as well. In addition, all of the lots will have porous driveways on each pad. The runoff from the lots and the private roads will ultimately by conveyed to one of two settling basins proposed for this area.*	X		
6.	**Residential Driveways & Guest Parking - Individual Priority Project Category** *For the Attached Residential Development, see the text immediately*				

	following this table.				
	The design of driveways and private residential parking areas shall use at least one of the following features.				
	6.a.	Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.	X		
	6.b.	Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.			X
	6.c.	Other features which are comparable and equally effective. *(for Drainage Basins 8000A and 8000B, porous driveways are being installed on all lots)*	X		
7.	**Dock Areas - Individual Priority Project Category** *Dock areas are not anticipated for the proposed project. Therefore this individual priority project category does not apply to the Meadowood Vesting TM.*				
	Loading/unloading dock areas shall include the following.				
	7.a.	Cover loading dock areas, or design drainage to preclude urban run-on and runoff.			X
	7.b.	Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.			X
	7.c.	Other features which are comparable and equally effective.			X
8.	**Maintenance Bays - Individual Priority Project Category** *Maintenance Bays are not anticipated for the proposed project. Therefore this individual priority project category does not apply to the Meadowood Vesting TM.*				
	Maintenance bays shall include the following.				
	8.a.	Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.			X
	8.b.	Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.			X
	8.c.	Other features which are comparable and equally effective.			X
9.	**Vehicle Wash Areas - Individual Priority Project Category** *Vehicle Wash Areas are not anticipated for the proposed project. Therefore this individual priority project category does not apply to the Meadowood Vesting TM.*				
	Priority projects that include areas for washing/steam cleaning of vehicles shall use the following.				
	9.a.	Self-contained; or covered with a roof or overhang.			X
	9.b.	Equipped with a clarifier or other pretreatment facility.			X

	9.c.	Properly connected to a sanitary sewer.			X
	9.d.	Other features which are comparable and equally effective.			X
10.	**Outdoor Processing Areas - Individual Priority Project Category** *Outdoor Processing Areas are not anticipated for the proposed project. Therefore this individual priority project category does not apply to the Meadowood Vesting TM.*				
	Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements.				X
	10.a.	Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.			X
	10.b.	Grade or berm area to prevent run-on from surrounding areas.			X
	10.c.	Installation of storm drains in areas of equipment repair is prohibited.			X
	10.d.	Other features which are comparable or equally effective.			X
11.	**Equipment Wash Areas - Individual Priority Project Category** *Equipment Wash Areas are not an Individual Priority Project Category for the Meadowood VTM project.*				
	Outdoor equipment/accessory washing and steam cleaning activities shall be.				X
	11.a.	Be self-contained; or covered with a roof or overhang.			X
	11.b.	Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate			X
	11.c.	Be properly connected to a sanitary sewer.			X
	11.d.	Other features which are comparable or equally effective.			X
12.	**Parking Areas - Individual Priority Project Category** *Parking Lots are not associated with the detached residential development category, see the following text for the remainder of the priority project categories (Parking Lots)*				
	The following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County.				
	12.a.	Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.			X
	12.b.	Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.			X
	12.c.	Other design concepts those are comparable and equally effective.			X
13.	**Fueling Area**				

	Fueling Areas are not an Individual Priority Project Category for the Meadowood VTM project.				
	Non-retail fuel dispensing areas shall contain the following.				
	13.a.	Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.			X
	13.b.	Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.			X
	13.c.	Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.			X
	13.d.	At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.			X

Unless otherwise stated in italic lettering, the above table is directly related to the detached residential development. In the following text the project has been separated into "Drainage Basins". For the location of these Drainage Basins, please refer to the exhibit located in Attachment D. The following Source Control section has been elaborated for the Meadowood VTM project for the remaining priority project categories.

At this time it is not believed that the Meadowood VTM will contain any Dock Areas, Maintenance Bays, Equipment Wash Areas, Fueling Areas, or Outdoor Processing Areas. In addition, the interior roads within this detached residential development portion of the project, associated with the northern areas (Drainage Basin 2000, 3000, 4000, and 7000A), are public roads. Therefore the northern detached residential development is exempt from the individual priority project category of Private Roads. However the detached residential development, for the southern portion of the project (Drainage Basin 8000A and 8000B), are private. Therefore the southern detached residential development individual priority project category of Private Roads remains. The hillside development is located within the northern portion of the project (outside of the attached residential development), therefore, the streets within this area are public and thus the hillside development is exempt from the Private Road individual priority project category. Drainage Basin 9000 consists of a public road, so it does not fall under any individual priority project categories. In summary the following Individual Priority Project Categories are associated with the Priority Project Categories:

- Northern Detached Residential Development (Drainage Basins 2000, 3000, 4000, 7000A)– Residential Driveways & Guest Parking, and Hillside Landscaping.
- Southern Detached Residential Development (Drainage Basins 8000A and 8000B)– Private Roads, Residential Driveways & Guest Parking, and Hillside Landscaping.

- Attached Residential Development (Portion of Drainage Basin 7000A)- Residential Driveways & Guest Parking, and Hillside Landscaping.
- Commercial Development > 1 Acre (Drainage Basin 7000B) – none (Note: The area defined as a Commercial Development Priority Project Category is the future school site associated with Drainage Basin 7000B. The Meadowood Project is mass grading the area associated with the future school site. Upon completion of the project, ownership of the mass graded pad will be transferred to the local school district. The local school district will be responsible to employ BMPs and prepare site specific SWMP in accordance with the County's March 24, 2008 SUSMP requirements.)
- Hillside Development > 5,000 ft^2 - Hillside Landscaping
- Parking Lots – Parking Areas
- Streets, Highways & Freeways – Roadways

Design Outdoors Material Storage Areas to Reduce Pollution Introduction

Outdoor Material Storage Areas may be associated with the Attached Residential Development located along the western boundary immediately south and east of Street B and Horse Ranch Creek Road, respectively (Drainage Basin 7000A). However, at this time, it is not anticipated that hazardous materials will be stored on site, however if applicable, the storage procedures for the hazardous material will follow one of the following protocol:

(1) Placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or

(2) Protected by secondary containment structures such as berms, dikes, or curbs.

In addition, the storage areas shall be paved and sufficiently impervious to contain leaks and spills and have a roof or awning to minimize direct precipitation within the secondary containment area.

Design Trash Storage Areas to Reduce Pollution Introduction

Trash Storage Areas may be associated with the Attached Residential Development located along the western boundary immediately south and east of Street B and Horse Ranch Creek Road, respectively (Drainage Basin 7000A).

The trash storage areas shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,
Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.

Private Roads – Individual Priority Project Category

Private Roads will be associated with the Attached Residential Development located along the western boundary of the project, immediately south and east of Street B and Horse Ranch Creek Road, respectively (Drainage Basin 7000A) and the detached residential development located at the southern portion of the project (Drainage Basin 8000A and 8000B). The southern portion of the project has been addressed in the above table. The following text specifically refers to the attached residential development.

For the attached residential development curb cuts will be installed so that the runoff associated with the pervious areas (private roads and parking areas) will be conveyed over landscaped areas. Ultimately this runoff will enter the settling basin associated with Drainage Basin 7000A.

Residential Driveways & Guest Parking - Individual Priority Project Category

The majority of the northern portion of the project is considered Detached Residential Development, however for the area located south and east of Street B and Horse Ranch Road (a portion of Drainage Basin 7000A), respectively, is classified as Attached Residential Development. For this area all runoff associated with the individual lots, parking areas and roads will be conveyed over the landscaped parkway prior to discharging into the downstream storm drains. Curb cuts will be installed to allow the runoff to enter the landscaped areas.

The southern portion of the project is considered Detached Residential Development (Drainage Basin 8000). This area is implementing porous driveways for all lots. Thus conveying the runoff from the lot to the driveway prior to being discharged downstream.

Parking Areas - Individual Priority Project Category

The majority of the northern portion of the project is considered Detached Residential Development, however for the area located south and east of Street B and Horse Ranch Road (a portion of Drainage Basin 7000A), respectively, is classified as Attached Residential Development. For this area all runoff associated with the individual lots, parking areas and roads will be conveyed over the landscaped parkway prior to discharging into the downstream storm drains. Curb cuts will be installed to allow the runoff to enter the landscaped areas. Ultimately this runoff will enter the settling basin associated with Drainage Basin 7000A.

TREATMENT CONTROL

To select the structural treatment BMPs for the Meadowood VTM, the project utilized the Treatment Control BMP Selection Matrix (Table 10 and 11). The Meadowood VTM compared the list of pollutants for which the downstream receiving waters are impaired, with the pollutants anticipated to be generated by the project (as identified in Table 4). If there had been any pollutants identified by Table 4, which were also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, the pollutants would have been considered primary pollutants of concern. Had this been the case, the Meadowood VTM project would have had to select a single or combination of Storm Water BMPs from Table 10, which would maximize pollutant removal for the particular primary pollutant(s) of concern.

As the Meadowood VTM does not have a primary pollutant of concern, the project is only required to have a single or combination of Storm Water BMPs from Table 10, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the "maximum extent practicable" standard.

Meadowood VTM is divided into seven on-site drainage basins in both the pre and post condition, as described in the introduction. The project proposes the implementation of 6 settling basins for the purposes of Treatment Control. As mentioned previously, these settling basins also incorporate detention for the 100-year storm event and hydromodification management. In addition, offsite improvements are associated with the Meadowood VTM. The offsite improvements are located along the future Pala Mesa Heights Drive, Horse Ranch Creek Road, Pala Mesa Drive/existing Pankey Road, and Street R. For the location of these offsite improvements, refer to the exhibit titled, *Water Quality Exhibit for Meadowood Vesting Tentative Map for Offsite Improvements,* located in Attachment D.

For the purposes of this report, only the water quality aspect of the hydromodification management pond/detention basin/settling pond has been discussed in detail. Refer to the project's Hydromodification Management Study and the Drainage Report for detailed information related to the ponds and detention analyses.

The following text addresses water quality treatment control bmps for each on-site drainage basin and the offsite area:

Drainage Basin 1000:
In the post-project condition, the runoff associated with the natural area, west of Street "D", does not commingle with the runoff associated with the street. This natural runoff will be conveyed to the west side of the street via a closed conduit. This outfall location will mimic the pre-project drainage patterns. Therefore, no treatment control BMPs are proposed (or necessary) for Drainage Basin 1000. At the outfall, and energy dissipater will be installed.

Drainage Basin 2000:
The runoff associated with Drainage Basin 2000 consists of areas that will remain undisturbed as well as a proposed single family development. These flows will be treated by High Rate Media Filters, in the form of BioClean Inlet Filters with BioMEDIA Green Filters at each of the 8 inlets in the drainage basin. The flows will then be conveyed in a proposed storm drain system to a detention basin (DB2) located along the westerly boundary of the project. Unlike the detention basins located in the other Drainage Basins, this detention basin is not sized to be a settling basin, however it will still provide benefits in addition to the Site Design BMPs, Source Control BMPs and Low Impact Developed devices that are proposed throughout the Drainage Basin.

Drainage Basin 3000:
In the post-project condition, this drainage basin is divided in two portions. The eastern portion of the drainage basin will remain undisturbed/natural in the post-project condition. The runoff associated with the eastern portion will flow naturally in a westerly direction until captured by the proposed storm drain system at one of five locations. The flows will then be conveyed in a westerly direction, through the proposed single-family development, to a settling basin (DB3) located at the western portion of Drainage Basin 3000. In addition to the Site Design BMPs, Source Control BMPs and Low Impact Development devices that are proposed throughout the Drainage Basin, the settling basin will treat the runoff associated with Drainage Basin 3000.

Drainage Basin 4000:
In the post-project condition, this drainage basin is entirely developed and consists of proposed single-family lots. The runoff associated with this drainage basin is captured by a proposed storm drain system that flows in a westerly direction to a settling basin (DB4) located at the western portion of the drainage basin. In addition to the Site Design BMPs, Source Control BMPs and Low Impact Development devices that are proposed throughout the Drainage Basin, the settling basin will treat the developed runoff associated with Drainage Basin 4000.

Drainage Basin 7000 (7000A & 7000B):
In the post-project condition, Drainage Basin 7000A is divided in two portions. The southerly and easterly portions of the drainage basin will remain undisturbed/natural in the post-project condition. The remainder of the basin will be comprised of single and multi-family development. The proposed storm drain system will capture the undeveloped flows and convey them through the single and multi-family development. Ultimately the developed and undeveloped flows will confluence in a settling basin (DB7A) located in the proposed park along the western boundary of the project. In addition to the Site Design BMPs, Source Control BMPs and Low Impact Development devices that are proposed throughout the Drainage Basin, the settling basin will treat the runoff associated with Drainage Basin 7000A. The outflow from DB7A will be conveyed in a southerly direction and combined with the outflows from DB7B.

In the post-project condition Drainage Basin 7000B, the drainage basin is divided into two portions. The easterly portion of the drainage basin is largely undisturbed/natural. The developed portion of the basin is located along the westerly drainage basin boundary and consists of a future school site. The developed and undeveloped flows will enter a proposed settling basin (DB7B) prior to exiting the project. The outflow from DB7B will be conveyed west and combine with the outflows from DB7A. The Meadowood Vesting Tentative Map is proposing to mass grade this site, upon completion of the mass grading Pardee Homes will turn over the site to the school district. In addition to the proposed settling basins, the school district will be responsible to design the appropriate on-site BMPs in accordance with the county's storm water regulations and ordinance.

As stated previously, the POC for Drainage Basin 7000A and 7000B have been combined. The combining of these drainage basins was due in part to the drainage patterns in the pre-project condition. The runoff flows from the pre-project condition of Drainage Basin 7000A exit the project site and are immediately conveyed to Horse Ranch Creek where they all combine or confluence in the same swale. In other words at each location in which runoff exits the project site, all the runoff flows westerly and combines in the same receiving water, which is located within the Horse Ranch Creek Floodplain. The swales convey these flows to a southerly location and confluence with the flows tributary to Drainage Basin 700B. Therefore, it is appropriate to combine these drainage basins and assign one POC for analysis.

Drainage Basin 8000 (8000A & 8000B):

In the post-project condition for Drainage Basin 8000A, the drainage basin is divided in two portions. The eastern portion of the drainage basin will remain undisturbed/natural in the post-project condition. The runoff associated with the eastern portion will flow naturally in a westerly direction until captured by the proposed storm drain system associated with Drainage Basin 8000A. The flows will then be conveyed in a westerly direction where they will commingle with the flows associated with the proposed single family development. Ultimately these flows will enter a settling basin (DB8A) located at the western portion of Drainage Basin 8000A. In addition to the Site Design BMPs, Source Control BMPs and Low Impact Development devices that are proposed throughout the Drainage Basin, the settling basin will treat the runoff associated with Drainage Basin 8000A.

In the post-project condition for Drainage Basin 8000B, the drainage basin is divided in two portions. The eastern portion of the drainage basin will remain undisturbed/natural in the post-project condition. The runoff associated with the eastern portion will flow naturally in a westerly direction until captured by the proposed storm drain system associated with Drainage Basin 8000B. The flows will then be conveyed in a westerly direction where they will commingle with the flows associated with the proposed single family development. Ultimately these flows will enter a settling basin (DB8B) located at the western portion of Drainage Basin 8000B. In addition to the Site Design BMPs, Source Control BMPs and Low Impact Development devices that are proposed throughout the Drainage Basin, the settling basin will treat the runoff associated with Drainage Basin 8000B.

From the topographic information, it is noted that the runoff associated with pre-project conditions of both Drainage Basins 8000A and 8000B sheet flow and there is not a defined location in which runoff exits the project. The runoff exiting the project site in both the pre- and post-project condition, immediately outfalls into the 100-year floodplain associated with Horse Ranch Creek. Both post-project outfalls for Drainage Basin 8000A and 8000B immediately outfall into the Riparian Forrest. Based on this information, it is appropriate to combine these drainage basins.

Drainage Basin 9000

Located along the southern limits of the Meadowood project within the Horse Ranch Creek Road right of way are two inlets (See exhibit located in Attachment D) The inlet located on the west side of Horse Ranch Creek Road has been identified as 9037A and the inlet located on the east side of Horse Ranch Creek Road has been identified as 9037B. The treatment control for these inlets will include a High Rate Media Filter. BioClean Environmental Services, Incorporated has developed an Inlet Filter Insert with a BioMEDIA Green Filter (discussed in further detail in Attachment E). In addition to the landscaped median and the vegetated swales associated with the road (see detail on exhibit), an inlet filter insert (high rate media BMP) will be installed in each inlet. One of the vegetated swales associated with the SR-76 located on the southern side of Drainage Basin 9000 adjacent to the water treatment facility will be removed and rebuilt as a result of grading associated with the Meadowood project (swale1). This swale will receive flows from a small portion of slope associated with the Meadowood project; however most of the flow it receives will still be from the SR-76 itself. The other swale (swale2) is located east of Horse Ranch Creek Road along the north side of SR-76. This swale will be rerouted so that it terminates into the proposed storm drain system, approximately 80 ft north of where it currently ends.

Offsite Drainage Basins

Several offsite drainage basins have been analyzed due to proposed road improvements located outside of the Meadowood footprint. The proposed storm drain, associated with the future road improvements, will capture the road drainage. Every inlet, associated with the offsite improvements will have a have a treatment control BMP (high rate media filter) installed. In total, there will be 32 BioClean Inlet Filters with BioMEDIA Green Filters installed offsite. For the location of these offsite BMPs, refer to the exhibit titled, *Water Quality Exhibit for Meadowood Vesting Tentative Map for Offsite Improvements*, located in Attachment D. Calculations have been performed for the offsite BMPs and are located in Attachment E.

The following table has been included from the March 24, 2008 County of San Diego SUSMP manual:

Table 10. Treatment Control BMP Selection Matrix

Pollutants of Concern	Bioretention Facilities (LID)*	Settling Basins (Dry Ponds)	Wet Ponds and Wetlands	Infiltration Facilities or Practices (LID)*	Media Filters	High-rate biofilters	High-rate media filters	Trash Racks & Hydro - dynamic Devices
Coarse Sediment and Trash	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low

*Additional information is available in the County of San Diego LID Handbook.

NOTES ON POLLUTANTS OF CONCERN:

In Table 11, Pollutants of Concern are grouped as gross pollutants, pollutants that tend to associate with fine particles, and pollutants that remain dissolved.

Table 11 Pollutant Particulate Size Reference Matrix

Pollutant	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	X	X	
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

A Treatment BMP must address runoff from developed areas. The post-construction water quality treatment flow and volume values for the onsite Treatment BMPs are provided below with associated outfalls labeled on the BMP map (Attachment D).

Drainage Management Area (Drainage Basin)	Tributary Area (acres)	Treatment Flow Rate, Q_{WQ} (cfs)	Treatment Volume, V_{WQ} (ft^3)
1000	n/a	n/a	n/a
2000 (2012A) (1)	1.5	0.3	n/a
2000 (2012B) (1)	1.4	0.3	n/a
2000 (2018A) (1)	0.2	0.0	n/a
2000 (2018B) (1)	0.6	0.1	n/a
2000 (2019A) (1)	0.3	0.1	n/a
2000 (2019B) (1)	0.2	0.0	n/a
2000 (2022.5A) (1)	0.2	0.0	n/a
2000 (2022.5B) (1)	1.6	0.3	n/a
3000 (DB3) (2)	61.6	n/a	1.7
4000 (DB4) (2)	11.2	n/a	0.4
7000A (DB7A) (2)	194.5	n/a	6.8
7000B (DB7B) (2)	45.3	n/a	1.3
8000A (DB8A) (2)	26.8	n/a	1.1
8000B (DB8B) (2)	26.1	n/a	1.0
9037A (3)	1.0	0.2	n/a
9037B (3)	0.8	0.1	n/a
Swale1 (4)	1.7	0.2	n/a
Swale2 (4)	1.5	0.2	n/a

cfs = cubic feet per second
ft^3 = cubic feet

(1) Drainage Management Areas within Drainage Basin 2000 are identified by Rational Method node numbers. Locations of BioClean units within Drainage Basin 2000 can be found in Attachment E.

(2) DB = Detention Facility / Settling Pond

(3) This drainage area is located along the southern boundary of the project, immediately south of Drainage Basin 8000B. Delineation of the drainage basins tributary to 9037A and 9037B is located in Attachment E. The drainage basin conveys runoff associated with the Horse Ranch Creek Road Improvements.

(4) This drainage area is located along the southern boundary of the project, immediately south of Drainage Basin 9000 and includes SR-76. Delineation of the drainage basins tributary to Swale1 and Swale2 is located in Attachment E. The drainage basin conveys runoff associated SR-76 and a portion of Drainage Basin 9000, in the case of Swale1.

The following table includes the post-construction water quality treatment flow values for the offsite Treatment Control BMPs. For location of the offsite BMPs refer to Attachment D.

Drainage Management Area[1] (Drainage Basin)	Tributary Area (Acres)[2]	Treatment Flow Rate, Q_{WQ} (cfs)	Treatment Volume, VWQ (ft3)
11000(11047A)	0.50	0.09	n/a
11000(11047B)	0.50	0.09	n/a
11000(11030A)	0.60	0.11	n/a
11000(11030B)	0.60	0.11	n/a
11000(11033A)	0.70	0.13	n/a
11000(11033B)	0.90	0.16	n/a
11000(11055A)	0.50	0.09	n/a
11000(11055B)	0.60	0.11	n/a
11000(11120A)	0.70	0.13	n/a
11000(11120B)	0.70	0.13	n/a
14000(14018A)	0.90	0.16	n/a
14000(14018B)	0.80	0.14	n/a
14000(14019A)	1.00	0.18	n/a
14000(14019B)	0.80	0.14	n/a
15000(15053A)	1.90	0.34	n/a
15000(15053B)	1.50	0.27	n/a
18000(18010A)	0.60	0.11	n/a
18000(18010B)	0.70	0.13	n/a
19000(19010A)	0.70	0.13	n/a
19000(19010B)	0.60	0.11	n/a
20000(20010A)	0.75	0.14	n/a
20000(20010B)	0.65	0.12	n/a
20000(20030A)	0.45	0.08	n/a
20000(20030B)	0.45	0.08	n/a
20000(20045A)	0.35	0.06	n/a
20000(20045B)	0.35	0.06	n/a

cfs = cubic feet per second

ft^3 = cubic feet

(1) Drainage Management Areas within are identified by Rational Method node numbers. Locations of BioClean units within Drainage Basin 2000 can be found in Attachment E.

The settling basins are a volume based BMP and the BioClean Inlet Filter Inserts with a BioMEDIA Green Filters and vegetated swales are flow based BMPs. Calculations and descriptions of the settling basins and inlet filter inserts can be found in Attachment E.

The box(s) that best describes the Treatment BMP(s) selected for this project.

Biofilters
☑ Bioretention swale
☐ Vegetated filter strip
☐ Storm Water Planter Box (open-bottomed)
☐ Storm Water Flow-Through Planter (sealed bottom)
☐ Bioretention Area
☐ Vegetated Roofs/Modules/Walls
Detention Basins
☑ Extended/dry detention basin with grass/vegetated lining*(The County of San Diego's SUSMP manual refers to this BMP as a "Settling Basin")*
☐ Extended/dry detention basin with impervious lining
Infiltration Basins
☐ Infiltration basin
☐ Infiltration trench
☐ Dry well
☐ Permeable Paving
☐ Gravel
☐ Permeable asphalt
☐ Pervious concrete
☐ Unit pavers, ungrouted, set on sand or gravel
☐ Subsurface reservoir bed
Wet Ponds or Wetlands
☐ Wet pond/basin (permanent pool)
☐ Constructed wetland
Filtration
☑ Media filtration *(BioClean Inlet Filter Insert with a BioMEDIA Green Filer)*
☐ Sand filtration
Hydrodynamic Separator Systems
☐ Swirl Concentrator
☐ Cyclone Separator
Trash Racks and Screens

Calculations and descriptions of the settling basins and inlet filter inserts can be found in Attachment E.

Below is a description of why the proposed treatment control BMPs were selected for this project. As stated previously, this project is proposing six settling ponds, ten BioClean Inlet Filter Inserts with a BioMEDIA Green Filter, and modifying two vegetated swales to treat the anticipated pollutants of concern in addition to utilizing Low Impact Development concepts, site design, and source control BMPs. In selecting the treatment control BMPs for the Meadowood VTM, each of the following Treatment Control BMP categories from Table 10 were evaluated. The following is a discussion of each evaluated BMP:

- BioRetention Facilities (LID) – Biofiltration is a process that uses vegetation for the purpose of slowing water velocity and filtering out pollutants. Bioretention areas are landscape features that typically consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. Storm water runoff is treated through a variety of physical, biological, and chemical treatment processes. The project did not implement this BMP throughout the site, however the project is proposing to modify existing vegetated swales, located within Drainage Basin 9000. As stated previously, the project is implementing a series of Settling Basins, which have a high rated pollutant removal efficiency rating similar to the BioRetention Facilities. With the implementation of Settling Basins, the project was able to treat a larger area without the implementation of significant mechanical BMPs.
- Settling Basins (Dry Ponds) – Settling Basins are also referred to as Extended detention basins that have outlets that are designed to detain storm water runoff from a water quality design storm for a minimum period of time (e.g., 24 hours) to allow particles and associated pollutants to settle out. Even though these facilities require a large amount of available space, they have been chosen as a practicable Treatment BMP to utilize throughout the project footprint. In total, six settling basins have been proposed and placed in strategic locations so that all of the post-project runoff (with the exception of the small area at the southern limits of the project that is being treated by a High Rate Media Filter) is conveyed through one of these facilities.
- Wet Ponds or Wetlands – Wet ponds and constructed wetlands are basins that temporarily retain storm water runoff and maintain a permanent pool. Pollutant removal is achieved by biological uptake of pollutants, filtration by vegetation and by soil, and settling. Wet ponds and constructed wetlands are volume-based, and the required water quality volume is three times that of extended detention basins due to the permanent pool. Due to size and location constraints as well as vector control issues, Wet Ponds and/or wetlands have not been selected as a practicable Treatment BMP for this project.
- Infiltration Facilities or Practices (LID) - Infiltration facilities are basins in which the majority of runoff from a water quality design storm is infiltrated into the soil rather than discharged to a surface water body. Infiltration basins are volume-based, but also have surface area restrictions that are based on volume, hydraulic conductivity, and drawdown time. For the northern portion of the project, the poor soils prohibits the use of an infiltration facility. For the southern portion of the project, since this area was already implementing a pond/detention basin for hydromodification management and 100-year detention, it was practicable to also incorporate into the pond/detention basin design, the design of a settling basin. In addition, a settling basin has equivalent pollutant removal efficiency ratings for the

pollutants of concern as that of an infiltration facility.

- Media Filters (Sand Filters) – Filtration devices contain filter media that removes pollutants from runoff through absorption or adsorption. Filtration systems may be open beds such as a sand filter or organic filter. For the northern portion of the project site, the on-site geotechnical constraints determined that these facilities are not practicable. For the southern portion of the project, since this area was already implementing a pond/detention basin for hydromodification and 100-year detention, and a settling basin has the equivalent pollutant removal efficiency ratings for the pollutants of concern as that of a Media Filter, it was practicable to also incorporate the appropriate volume for a settling basin rather than a Media Filter. In addition, the settling basins provide better treatment of dissolved pollutants.
- High-Rate Biofilters –High-Rate Biofilters are specifically designed with media to rapidly filter runoff while removing some pollutants. High-Rate Biofilters were not selected for the project because they are not the most practicable, nor do they have equivalent pollutant removal efficiency ratings as Settling Basins.
- High-Rate Media Filters (typically Proprietary) – High-Rate Media Filter devices contain filter media that removes pollutants from runoff through absorption or adsorption. Filtration systems will consists of manufactured units of filter media contained within constructed vaults. Two BioClean Inlet Filter Inserts with a BioMEDIA Green Filter were utilized to treat the pollutants of concern associated with the southern limits of Horse Ranch Creek Road in Drainage Basin 9000 and eight BioClean Inlet Filter Inserts with BioMEDIA Green Filters were utilized to treat pollutants of concern associated with Drainage Basin 2000. In addition, 32 BioClean Inlet Filter Inserts with BioMEDIA Green Filters were utilized to treat the runoff associated with the offsite improvements. These High-Rate Media Filters have been designed in accordance with the County's SUSMP and the Manufacture Specifications. The locations of these devices are show on the exhibits located in Attachment D. Calculations for both onsite and offsite BMPS have been included in Attachment E.
- Trash Racks & Hydrodynamic Separator – Hydrodynamic separators are flow-through structures with a settling or separation unit that removes sediment and other pollutants. No outside power source is required because the energy of the flowing storm water allows the sediment to efficiently settle out. These BMPs were not chosen due to their inefficiency and cost. In addition, they are not as effective in treating the anticipated pollutants of concern when compared to the proposed Settling Basins or High-Rate Media Filters (BioClean Inlet Filter Inserts with a BioMEDIA Green Filter).

Calculations and descriptions of the Settling Basins, BioClean Inlet Filter Inserts with a BioMEDIA Green Filter, and vegetated swales can be found in Attachment E.

MAINTENANCE & INSPECTION

The boxes that best describe the maintenance mechanisms for Meadowood VTM are the First and Second Categories. Guidelines for each category are located in Chapter 5, Section 5.2 of the County SUSMP. All of the BMPs will be inspected and maintained by the project's Home Owners Association (HOA) with the exception of the underground vault associated with the sewer treatment plant and the vegetated swales. We confirmed that our plans did not adversely impact the numeric sizing of the SR-76 vegetated swales, so as a result, these swales will remain to be the responsibility of the California Department of Transportation, so as a result have not been included in this section. In addition, the underground hydromodification management vault associated with the sewer treatment plant will be the responsibility of the sewer treatment plant, so only the underground vault associated with Drainage Basin 9000 will be addressed in this section

CATEGORY	SELECTED	
	YES	NO
First	X	
Second[1]	X	
Third[1]		
Fourth		

Note:

1. Projects in Category 2 or 3 may choose to establish or be included in a Storm Water Maintenance Assessment District for the long-term maintenance of treatment BMPs.

The first category of BMPs is BMPs which "take care of themselves" so little maintenance is required. The first category BMPs proposed for this project are vegetated/landscaped areas, trash and storage areas, and energy dissipaters.

The second category of BMPs are BMPs that require more maintenance than the first category BMPs. In addition, the maintenance will be performed by the property owners or a Home Owners Associated. For the Meadowood VTM, the Settling Basins and BioClean Inlet Filter Inserts with a BioMEDIA Green Filter (both onsite and offsite) are considered second category BMPs because they require regular inspection and maintenance. In addition, although they are not technically BMPs, the underground vaults sized for hydromodification management associated with Drainage Basin 9000 do require maintenance, and also fall into this second category because they also require regular inspection and maintenance.

Following the completion of the project and the transferring of ownership (if applicable), the established Homeowner's Association (HOA) will be responsible for the post-construction BMPs both onsite and offsite. At this time an Operations and Maintenance Program (OMP) has not been prepared. Upon final design, when the OMP is prepared, it will be included in Attachment F. The following is a discussion of the anticipated maintenance condition(s) for the on-site post-construction structural treatment control BMPs:

BioClean Inlet Filter Inserts with BioMEDIA Green Filter

The frequency of maintenance required for the BioClean Inlet Filter Inserts is site and drainage area specific, and therefore a record of these inspections and maintenance should be recorded and kept. Inserts should be inspected periodically to assure their condition is adequate to handle anticipated runoff. Initially following the installation of the BioClean Inlet Filter Inserts, it is recommended by the manufacturer to check that the insert is functioning properly and measure the amount of deposition occurring from specific storm events. At a minimum, inspections should be made on a monthly basis and after every storm event to check that the unit is functioning properly and whether the insert requires servicing at that time. Based on these inspections, it may be necessary to adjust the frequency of scheduled inspections and maintenance cleanings.

The BioClean insert service procedures include the removal of the manhole cover, properly disposing of the waste, replacing the filter media as necessary, inspecting for needed repairs and/or replacement of the filter medium, closing the manhole cover, properly disposing of the waste, and recording the maintenance service for future reference. For additional information of the BioClean BMPs, refer to Attachment E in the back of this report.

All records including training, inspection, and maintenance records must be kept for a minimum of five years. These records must be made available to the County of San Diego upon request

Settling Basins

The following section discusses the maintenance of the settling basins. Each settling basin shall be inspected regularly during the rainy season between October 1 and April 30. The settling basin inlets and outlets shall be inspected for trash, litter, debris, or other solid materials that may hinder the intended function of the settling basins. Any eroded areas shall be restored and re-vegetated, while invasive species shall be removed as needed.

The maintenance procedure for servicing the settling basins consists of mostly sediment, trash, and debris removal. In addition, regards to vegetation management shall have to be taken into consideration. Typical actives and frequencies include:

1) Schedule semiannual inspection for the beginning and end of the wet season for standing water, slope stability, sediment accumulation, trash and debris, and presence of burrows.
2) Remove accumulated trash and debris in the basin and around the riser pipe/outlet during the semiannual inspections. The frequency of the activity may be altered to meet specific site conditions.
3) Trim vegetation at the beginning and end of the wet season and inspect monthly to prevent establishment of woody vegetation and for aesthetic and vector reasons.
4) Remove accumulated sediment and re-grade about every 10-year or when the accumulated sediment volume exceeds 10 percent of the basin volume. Inspect the basin each year for accumulated sediment volume.

All records including training, inspection, and maintenance records must be kept for a minimum of five years. These records must be made available to the County of San Diego upon request.

Underground Vault

Maintenance for the proposed underground vault located within Drainage Basin 9000 and sized for hydromodification management will be minimal due to the BioClean Inlet Inserts with BioMEDIA Green Filters located upstream of the proposed underground vault. The devices will capture trash and debris prior to discharging into the underground vault. However, the underground vault should be inspected and maintained for optimal operation. The required maintenance frequency will depend on the amount of rainfall and the sediment, trash and debris load, and must be determined by inspecting the underground vault after it has been installed and is functioning.