



Technical Memorandum Task 10: TMDL Implementation Analysis

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1.0 Introduction

This Technical Memorandum (TM) has been prepared as a step in developing a Total Maximum Daily Load (TMDL) Implementation Plan for Bacteria in Malibu Creek Watershed (MCW). Technical Memorandums for Task 3, Identification of Water Quality Areas of Concern North Santa Monica Bay Watersheds Regional Watershed Implementation Plan and Malibu Creek Bacterial TMDL; Task 4, Evaluation of Nonstructural BMP Options; and Task 7, Preliminary Evaluation of Structural Solutions, have presented the range of potential structural and nonstructural best management practices (BMPs) and provided an initial discussion and feasibility assessment of the BMPs. This TM presents an analysis and initial selection of BMP alternatives for implementation to address the TMDL as the first steps toward an iterative and adaptive process.

1.1 Malibu Creek Watershed

The MCW area is approximately 109 square miles (mi²) and includes Malibu Creek as well as several creeks and lakes located in the upper part of the watershed. The watershed stretches across the northern part of Los Angeles County and the southern part of Ventura County, bounded on the Santa Monica Mountains, the Simi Hills and the Pacific Coast as Santa Monica Bay. Figure 1 shows the subwatersheds that comprise the MCW, and identifies the impaired waterbodies within the MCW. Figure 1 also shows tentative compliance points for Total Maximum Daily Load (TMDL) limits. The Regional Water Quality Control Board will establish final compliance, as well as additional compliance points in each watershed.

Many of the headwaters of the Malibu Creek watershed are drained by Municipal Separate Storm Sewer Systems (MS4s) in the cities of Thousand Oaks, Agoura Hills, Calabasas, and Westlake Village. Runoff from these cities is discharged into upper Malibu Creek, Las Virgenes Creek, other tributaries, and four inland lakes. In the middle of the watershed, streams route urban runoff through the Santa Monica Mountains, which is comprised primarily of state park land and other open space. These tributaries ultimately combine with lower Malibu Creek upstream of the Tapia Water Reclamation Facility (WRF). The Tapia WRF treats wastewater from the Las Virgenes Municipal Water District (LVMWD) service area.

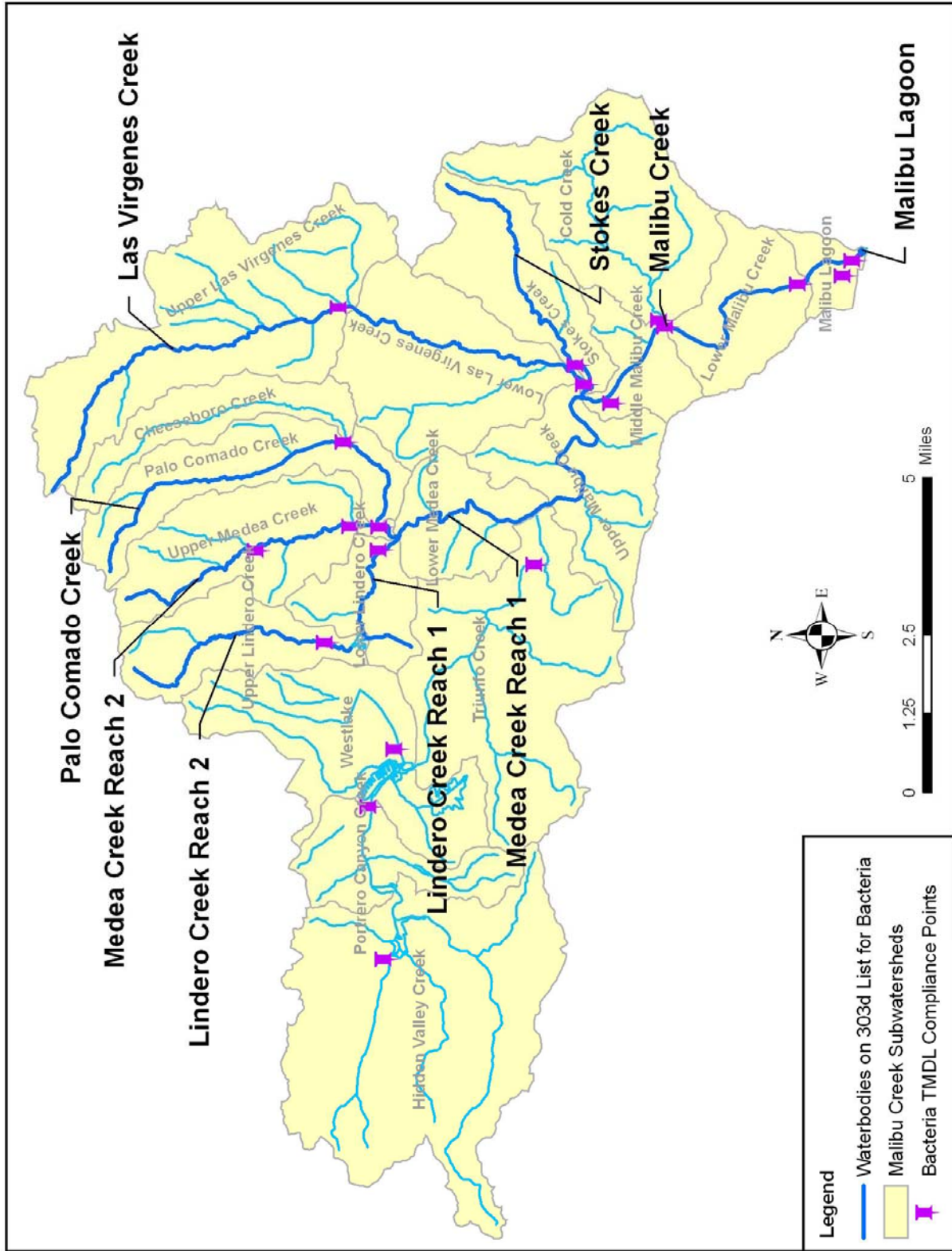


Figure 1-1
Subwatersheds and Bacteria 303d Listed Waterbodies in the MCW

The LVMWD National Pollution Discharge Elimination System (NPDES) permit prohibits any effluent discharge during the summer months (April 15 through November 15).

A large portion of the low flow effluent is reused and the remainder is eliminated through irrigation of other open spaces in the watershed. The remaining low flow (without effluent) in lower Malibu Creek during the summer is contained in the Malibu Lagoon. Lower Malibu Creek also captures additional urban runoff from a commercial portion of the City of Malibu prior to reaching the lagoon. . The lagoon is breached during high flow events in the wet season. This hydrologic scenario results in water quality conditions throughout the watershed that vary greatly spatially and seasonally.

MCW is unique among the greater Los Angeles area watersheds because a majority of the watershed contains a large amount of open space and several natural creeks. This region is primarily characterized by its rural environment, natural beauty, wildlife, and recreational opportunities. However, MCW also supports urban, residential, and business communities primarily at the mouth of Malibu Creek and in the upper reaches of MCW in both Los Angeles and Ventura Counties. Roads, highways, water utilities, sanitary sewer systems, on-site wastewater treatment systems, and coordinated trash disposal serve these diverse communities. Storm water discharges from these communities can convey pollutants that impact the natural waterways and northern beaches of Santa Monica Bay. Storm water dischargers are responsible for compliance with TMDL regulations governing the bacteria levels in 303(d)-listed streams in the MCW. To address these regulations, municipalities and agencies within the MCW are developing an Implementation Plan for the Dry- and Wet-Weather Bacteria TMDL.

1.2 Purpose of the Bacteria TMDL Implementation Plan

The goal or purpose of the Bacteria TMDL Implementation Plan is to address watershed management principles through strategic implementation of best management practices (BMPs) to obtain optimal reductions in bacterial loading to streams, while providing water quality benefits for other constituents as well.

The objectives of the TMDL Implementation Plan are as follows:

- To improve and maintain water quality within the MCW consistent with the Bacteria TMDL;
- To recommend a plan of action to address compliance with TMDL regulations; and
- To be a living document that is updated as the TMDL is implemented and as requirements evolve.

1.3 Purpose and Organization of this Document

The purpose of this TM is to compile the technical and regulatory information from Tasks 3, 4 and 7 to identify a range of alternatives that could be implemented to meet the requirements of

the TMDL. This analysis includes the development of alternatives evaluation criteria as a means to compare the alternatives. Based on the results of the alternatives comparison, as well as previous watershed prioritization efforts, programs and projects will be selected for inclusion in the Implementation Plan on a subwatershed by subwatershed basis. This framework creates the "building blocks" of the initial commitments by the MCW agencies for implementation. Three different groupings of alternatives with differing approach and emphasis and were developed based on the findings of Tasks 3, 4, and 7 and the subwatershed prioritizations to provide a framework for selecting specific projects and programs for inclusion in the Implementation Plan. Each alternative is comprised of a different combination of several runoff management options to address integrated solutions (such as beneficial reuse and multiple pollutants) and to meet the load allocations of the TMDL to varying degrees. This TM presents the approach for defining and evaluating BMPs for high, medium, and low subwatersheds. Sample BMP selections for a high, medium, and low priority subwatershed are provided at the end of this memorandum.

2.0 Development and Evaluation of Overall Alternatives

2.1 Summary of Previous Tasks

The development and analysis of alternatives and selection of components for inclusion in the implementation plan utilized information developed in prior tasks. A brief summary of key findings of these tasks follows. For a more detailed discussion references to the applicable TMs are provided.

2.1.1 Source Identification and Prioritization of Areas of Concern

TM 3.1 identified the sources of bacteria and prioritized the areas of concern (AOC) in the subwatersheds. Eight bacteria land use source categories were identified with the estimated percentage of existing bacteria loading from land use listed. AOCs were determined for each of the 18 subwatersheds. The approach considered loading potential related to different land uses and actual bacteria conditions in the watershed. Further details regarding source identification and AOC are provided in TM 3.1.

2.1.2 Hydrogeology and Aquifers

TM 3.2A analyzed the hydrogeology and aquifer characteristics of the MCW to determine the potential for infiltration associated with implementation of best management practices and to offset imported water demands. The spatial distribution of alluvial deposits limits the potential areas of regional recharge. This highlights the importance of identifying local, on-site, infiltration sites associated with structural BMPs. The upper reaches of Malibu Creek Watershed, in particular Upper Lindero and Upper Medea creeks, where these alluvial deposits exist in areas of concentrated urban development, represent the initial focus area for siting local infiltration projects. TM 3.2A provides further details of the hydrogeology and aquifer analysis in the MCW.

2.1.3 Water Supply and Reuse

TM 3.2B focused on water supply and reuse opportunities existing within the MCW. Reuse opportunities exist at both the local (on-site) and regional levels. Local stormwater reuse in the MCW is limited to cisterns and on-site infiltration. Reuse capacity related to cisterns is estimated at 1,000 AFY for MCW. Regional recharge in MCW is limited. These difficulties include lack of surface storage capability, lack of significant additional customer base, and high treatment and distribution costs. Lack of large alluvial aquifers, with existing significant groundwater withdrawals, limits opportunities for groundwater recharge and subsequent beneficial reuse of significant quantities of stormwater. These limitations on regional reuse scenarios emphasize the importance of distributed, watershed-wide, local small-scale stormwater reuse and infiltration projects as the most suitable management tool for reducing storm runoff in addition to water conservation opportunities to help maintain the existing water supply. TM 3.2B provides further details regarding water supply and reuse opportunities.

2.1.4 Recreational Uses

Recreational areas for potential BMPs were identified in TM 3.3. Recreational sites in MCW were prioritized based on the potential for the subwatersheds to contribute bacteria loads to the streams and waterbodies through stormwater or dry-weather runoff. Sites identified as appropriate for combined recreation and water quality use were included for further assessment for BMP implementation, such as natural treatment systems, infiltration areas, or other structural BMPs combined with enhanced recreational or educational opportunities. Areas identified for specific types of recreational uses, such as equestrian trails or campgrounds will be considered for recommendation of site-specific BMPs. Details regarding the use of recreational opportunities are provided in TM 3.3.

2.1.5 Non-Structural BMPs

TMs associated with Task 4 (TMs 4.1 – 4.4) evaluated existing, new, and enhanced programs or BMPs that provide a non-structural menu of potential options to address the MCW Bacteria TMDL. These activities are divided into six programs: 1) Public Information and Participation, 2) Industrial/Commercial Facilities Control Programs 3) Development Planning Program, 4) Development Construction Program, 5) Public Agency Activities Program, and 6) Illicit Connections/Illicit Discharges Program. Five criteria were developed to evaluate the programs or BMPs: effectiveness, relative cost, risk of implementation, risk of no implementation, and dry- and wet-weather applicability. The five criteria are further defined in TM 4.4.

2.1.5.1 Public Information and Participation

Public Information and Participation Programs (PIPP) are those programs that seek to educate and involve individuals, create awareness of water quality problems and measures to improve stormwater quality, thus encouraging behavioral modification resulting in improved water quality. BMPs in this category are designed to address the following sources of bacteria:

- Urban runoff (including residential and commercial/industrial users);

- Onsite wastewater treatment systems; and
- Horses and confined animal facilities (private/non-commercial).

Implementation of additional BMPs in this category can potentially reduce bacterial and other pollutant loading by increasing the education of residents and businesses within the watershed. Increasing awareness regarding human health risks, bacterial sources, runoff as a means of conveyance to transport bacteria, and an appropriate behavior or changes to reduce pollution will increase knowledge and decrease bacterial and other pollutant loadings. People are more apt to make behavioral modifications if they understand the relationship between their activities and the impact of their specific activities on bacterial loading in dry- and wet-weather runoff. The PIPP as it pertains to the NPDES Permits is further described in Technical Memorandum 4.1. Evaluations for the nonstructural BMPs and performance measures are categorized within the Public Information and Participation Program. TM 4.4 provides rankings of the PIPP.

2.1.5.2 Industrial/Commercial Facilities Control Programs

The Industrial/Commercial Facilities Control Programs are designed to require Permittees to inventory, track, and inspect all commercial/industrial facilities for BMP implementation. The overall goals are to improve activities at commercial and industrial sites through outreach, site visits, incentives, and/or inspections and enforcement. In this category, BMPs are designed to address the following potential bacteria sources:

- Urban runoff (from commercial/industrial sites);
- Onsite wastewater treatment systems at businesses;
- Horses and confined animal facilities (commercial); and
- Agriculture uses.

TM 4.1 provides a more in-depth discussion regarding the programs. Implementation of additional BMPs in this category can potentially reduce bacterial loading by creating awareness throughout the business community of bacteria TMDLs, emphasizing the importance of compliance with BMPs to reduce bacterial loading, and changing business practices currently contributing to bacterial loading. Specific types of businesses thought to be contributing to bacterial loading include restaurants and commercial equestrian centers. Thus, industry specific BMPs have been developed for these types of businesses. Evaluations and performance measures for the non-structural BMPs are provided in TM 4.4.

2.1.5.3 Development Planning Program

Development Planning Programs are designed to minimize water quality impacts associated with stormwater generated from development and redevelopment planning projects throughout the project life. These BMPs are similar in nature to Structural-Institutional

Development Planning BMPs (discussed later), but these BMPs are more focused on behavioral or operations and maintenance changes. Bacteria and other pollutant sources that may be affected by the Development Planning Program include:

- Urban runoff (including residential and commercial/industrial users);
- Onsite wastewater treatment systems; and
- Horse and confined animal facilities.

A more detailed description of the programs is provided in Technical Memorandum 4.2. The suite of potential BMP enhancements and new BMPs identified for the Development Planning Program seeks to reduce bacterial loading by: requiring post-construction BMPs that must be maintained through the life of the construction project, providing more education to developers regarding the impacts of their activities on urban runoff, requiring mandatory inspections and servicing of septic tanks constructed as a part of new projects, and incorporating programs to recognize and encourage sustainable building techniques. An evaluation of the performance measures is included in TM 4.4.

CEQA documentation is included within the development planning process. Addressing dry- and wet-weather bacteria TMDLs during the CEQA process will require modification of existing hydrology and water quality evaluation criteria. Three steps are recommended:

1. Identify the TMDL required issues not currently addressed by CEQA
2. Address required TMDL issues within standard conditions of approval.
3. Modify CEQA review process.

A more in-depth discussion is provided in TM 4.2.

2.1.5.4 Development Construction

Development Construction Programs target stormwater quality associated with construction sites. If existing BMPs are not adequately implemented, construction can contribute a substantial volume of sediment and other pollutants to storm drains and receiving waters since the sites are generally stripped of vegetation during construction. Construction sites can be potential sources of bacteria in the runoff. The goal of the program is to minimize the amount of bacteria in runoff from construction sites before the runoff enters the storm drain system or receiving water bodies. BMP enhancements and new BMPs developed for the Development Construction Program are targeted towards reducing the introduction of bacteria from temporary toilets and the improper disposal of food, and increasing education of contractors on how their practices can reduce bacteria and other pollutant loading. The Development Construction Program is more fully described in TM 4.2 and an evaluation of the non-structural BMPs is provided in TM 4.4.

2.1.5.5 Public Agency Activities

The Public Agency Activities Program addresses stormwater quality as it relates to activities, such as routine maintenance of public facilities and construction of public facilities. The applicable programs for the agencies provide guidance in addressing the existing BMPs required under the applicable NPDES Permits and thus do not specifically target bacteria, but rather pollutants in general. Enhancements to the existing BMPs and new BMPs in key areas of public agency activities can potentially reduce bacterial loading. The Public Agency Activities Program is more thoroughly described in Technical Memorandum 4.3. Evaluations of the nonstructural programs are provided in TM 4.4.

2.1.5.6 Illicit Connections/Illicit Discharges Program

The purpose of the Illicit Connections/Illicit Discharges Program under the NPDES Permit is to inspect, remove, and prohibit illicit connections and illicit discharges to the storm drain system and receiving water bodies. Illicit connections/illicit discharges (IC/ID) potentially provide both a conveyance mechanism for bacteria in the form of runoff and/or act as a source of bacteria dependent upon the location of the upstream illicit connection. A more detailed description of the existing program is provided in TM 4.3. Modifications to the existing BMPs under this program can be considered to further reduce the potential bacteria transmittal through IC/ID. Any reductions associated with IC/ID will reduce bacterial and other pollutant loadings. Numerous BMP enhancements are suggested to bolster the existing programs, including standardized inspections and enforcement. Existing BMPs, enhancements, and new BMPs within this program are evaluated in TM 4.4.

2.1.6 Structural BMPs

Structural Best Management Practices can be potentially implemented on a local, sub-regional, or regional scale. The Implementation Plan will include suites of recommended combinations of structural and non-structural measures to be implemented as appropriate within each jurisdiction or combination of jurisdictions that can quantitatively be predicted to have some success of achieving the reduction in exceedence days required by the TMDL.

The description and identification of structural BMPs are based on four general BMP categories, or "families." The primary differentiators of these structural BMP families are the size of tributary drainage area and implementing entities. The following BMP families are used throughout this memorandum:

- Structural-Institutional BMPs
- Distributed BMPs
- Regional/Subregional BMPs

Stream Enhancement Measures are also discussed and would provide multiple hydrologic and environmental, as well as water quality benefits.

These BMPs identified within each of these families are described briefly below. A more thorough discussion of structural BMPs is provided in TMs 7.2 and 7.3.

2.1.6.1 Structural-Institutional BMPs

Structural-Institutional BMPs are structurally based measures implemented or mandated at the institutional level through ordinances, policies, and incentives. They could include stormwater devices or management practices that are implemented at the individual lot level (i.e., very small drainage areas) by agencies with jurisdictions over larger geographic regions. Options include:

- Development and Redevelopment Design Standards – Runoff volume management, source reduction, and treatment controls. These BMPs are similar in nature to the non-structural development planning BMPs and would be managed similarly. These differ from the non-structural BMPs in that they result in a physical change to the environment.
- Downspout Redirect Program – Public education to encourage voluntary redirection of roof downspouts to infiltration areas, provide materials and personnel to redirect drains, offer do-it-yourself homeowners one-time payments for each drain redirect, and offer non-profit organizations fees for each drain redirect
- Residential Stormwater Fee Discount Programs – Reduction of stormwater fees for municipalities that collect such fees for implementation of set structural BMPs
- Commercial and Industrial Area Retrofit Programs – Voluntary retrofit and stormwater management, financial incentives, and design ordinances
- Stream Buffers – stream buffer setbacks (undevelopable areas) between developments and riparian corridors
- Horse Farm Retrofit Program – Design standards, management education, BMP retrofits

2.1.6.2 Distributed BMPs

Distributed BMPs are implemented at a local scale and would treat runoff from local neighborhoods and groups of parcels. The basic concept behind distributed BMPs (closely related to “low impact development” practices) is to reduce runoff volumes and loads near the pollutant sources, within areas under the jurisdiction by the local agencies. The stormwater management strategy focuses on reducing the hydrologic impact caused by development and maintaining or restoring the natural hydrologic and hydraulic functions of a site, potentially in conjunction with other BMPs. Distributed BMPs employ a variety of natural and constructed features that reduce the rate of runoff, filter pollutants, and facilitate the infiltration of water into the ground at the large parcel scale. By reducing water pollution and potentially increasing groundwater recharge, these BMPs help improve the quality of receiving surface waters, help manage the flow rates and volumes discharged to impacted streams, and reduce the hydraulic and pollutant loading burden on downstream regional treatment facilities. These BMPs include

stormwater devices and landscaping practices, which are dispersed throughout a catchment and typically serve drainage areas on the order of 10 acres. These could include treatment for large single parcels or sections of roadway. A summary of the options is presented below:

- Local Detention – Cisterns and rain barrels and on-site storage and reuse
- Vegetated Treatment Systems – Vegetated swales, filter strips, bioretention, and stormwater planters
- Local Infiltration Systems – Permeable paving, retention grading, and infiltration pits
- Media Filters – Passive flow-through filtration systems that trap particulates and remove pollutants, such as metals, nutrients, hydrocarbons, and could partially reduce bacteria levels
- Gross Solids Removal Devices – Hydrodynamic separators that are off-line or in-line structures designed to reduce, or manipulate flow velocities such that particulate matter falls out of suspension and settles in a collection chamber
- Drain Inlet Inserts and Filters – Inserts placed in drains to filter and trap pollutants
- Street and Parking Lot Biofiltration Retrofits – Curb extension swale, Street landscape retrofits, parking areas
- Combination Solutions – Combination of two or more structural BMPs

2.1.6.3 Regional/Sub-Regional BMPs

Regional and subregional BMPs provide treatment for moderate to large size catchments, on the scale from 10s of acres to square miles. These facilities are located at the outlets of catchments that encompass the target treatment areas, and thus tend to be separated from primary sources. Because of this separation, these facilities may also provide incidental treatment of runoff from secondary or non-source areas such as open space runoff or groundwater base flows, which can increase the size and costs of the facility. Regional treatment concentrates the structural components and maintenance requirements into a limited number of locations, and provides a measure of assurance that all runoff will receive treatment, although potentially at a less effective and less efficient level. Regional/sub-regional BMPs are summarized below:

- Regional Detention – Provides detention of water for a period of 24 to 48 hours with treatment occurring through sedimentation and infiltration.
- Regional Infiltration – Large shallow impoundments designed to infiltrate runoff
- Regional Natural Treatment Systems – Free-surface water constructed wetlands and subsurface flow constructed wetlands

- Treatment Facilities – Diversion to wastewater treatment plant, advanced oxidation, and peracetic acid
- Manufactured Separation Systems – trash nets and trash racks, floating trash traps and booms, hydrodynamic separators, hydraulically operated trash racks

2.1.6.4 Stream Enhancement Measures

These measures can be similar to regional BMPs in scale but can also be implemented at a regional or institutional level. Potential projects would be located downstream of fairly large catchment areas. The primary function of these measures, however, is differentiated from BMPs in that the objective is the restoration of biodiversity, stability, and natural assimilative capacity of existing streams, which can have a corresponding improvement in water quality. For maximum benefit, these measures should be considered in conjunction with and downstream of implemented structural BMP projects. A summary of the options is provided below:

- Institutional Structural BMPs – Reducing the impacts of urbanization on stream erosion can be considered in institutional BMPs through NPDES permits
- Structural Measures – Streambank vegetation, invasive plant species removal, connection of channel with floodplain, habitat enhancement, and wetland enhancement
- Current Restoration Projects – Restoration projects have been identified through other efforts, including Proposition 50 Integrated Regional Water Management Plan and the NSMBW Task Force Structural Working Group

2.1.6.5 Pollutant Removal Capabilities of Structural BMPs

In addition to bacteria, most of the structural BMPs discussed provide treatment for a wide-range of common storm water constituents. In the interest of integrated resource management, the other treatment capabilities of BMPs are identified and will be considered when selecting suites of BMPs for bacteria control. Treatment capabilities of the structural BMPs are listed in Table 2-1.

Table 2-1: Other Pollutant Removal Capabilities of Structural BMPs

Structural BMP Category	Target Pollutants					
	Trash	Sediment	Nutrients	Metals	Bacteria	Organic Pollutants
Distributed BMPs						
Local Capture Systems	○	○	○	○	○	○
Vegetated Treatment Systems	●	●	●	○	○	○
Local Infiltration Systems	●	●	●	●	●	●
Media Filters	●	●	○	○	○	○
Gross Solids Removal Devices	●	○	○	○	○	○
Drain Inlet Inserts and Filters	●	●	○	○	○	○
Street and Parking Lot Biofiltration Retrofits	●	●	●	○	○	○
Equestrian Related BMPs	○	○	●	○	●	○
Regional/Subregional BMPs						
Regional Detention	●	●	○	○	○	○
Regional Infiltration	●	●	●	●	●	●
Regional Natural Treatment Systems	●	●	●	○	○	○
Treatment Facilities	●	●	●	●	●	○

¹ ● - High Effectiveness ○ Moderate Effectiveness ○ - Limited Effectiveness

² All pollutant groups include trash, sediment, nutrients, metals, bacteria, and organic pollutants

2.1.6.6 Location Evaluation

Potential sites and applicable land uses for structural facilities were evaluated. Both local (including sub-regional) and regional siting options were considered. Based on consideration of space and engineering requirements, GIS was utilized to determine potential parcels that could potentially be suitable for structural BMPs.

Features that were used for initial preliminary screening included:

- All City owned parks and recreational areas. State or federal owned parks and recreational areas were removed from the list of potential sites.
- Parcels greater than 1 acre in size.
- Parcels containing any significant portion with slopes less than 25%.
- Parcels downstream of potential pollutant sources.
- Parcels within or directly downstream of high-priority subwatersheds (Malibu Lagoon, Lower Las Virgenes Creek, Stokes Creek, Lower Medea Creek, Upper Medea Creek, Lower Lindero Creek, Upper Lindero Creek, Westlake, Potrero Canyon Creek, and Hidden Valley Creek). All types of publicly owned parcels and those privately owned parcels that are within an area designated as “vacant undifferentiated” by the Southern California Area Governments (SCAG) GIS database.

Table 2-2 shown below provides a list of general structural BMPs developed for each land use category. A more detailed discussion is provided in TM 7.2.

Within TM 7.3 a feasibility assessment was conducted for siting regional structural BMPs. Regional structural BMPs considered as feasible included infiltration basins, free surface flow wetlands, subsurface flow wetlands, and conventional disinfection. A key element of potential siting is the design concept storm, developed by the County of Los Angeles and approved by the stakeholders. A summary of the results is provided in Table 2-3 below. TM 7.3 provides a more detailed discussion on how this table was developed.

Table 2-2 – General Structural BMP Approaches by Land Use Category

	Single Family and Multi-Family Residential	Major Roads and Freeways	Commercial, Industrial, and Institutional	Horse Ranches	Parks and Institutional Facilities	Agricultural	Open/Vacant
Institutional-Structural BMPs	<ul style="list-style-type: none"> • Development standards • Downspout redirect program • Stream buffers 	<ul style="list-style-type: none"> • Development standards • Stream buffers 	<ul style="list-style-type: none"> • Development standards • Downspout redirect program • Commercial and industrial area retrofit program • Stream buffers 	<ul style="list-style-type: none"> • Development standards • Horse farm retrofit program • Stream buffers 	<ul style="list-style-type: none"> • Stream buffers • Model demonstration sites for downspout redirect program and/or commercial and industrial area retrofit program 	<ul style="list-style-type: none"> • Stream buffers 	
Distributed BMPs	<ul style="list-style-type: none"> • Local detention • Vegetated treatment systems • Local infiltration systems • Street and parking lot biofiltration retrofits • Media filtration 	<ul style="list-style-type: none"> • Swales, filter strips, biofiltration along road perimeters and at interchanges • Media filtration • Hydrodynamic separators • Catch basin filters 	<ul style="list-style-type: none"> • Local detention • Street and parking lot biofiltration retrofits: swales, filter strips, bioretention, planter boxes • Media filtration • Local infiltration systems • Hydrodynamic separators • Catch basin filters 	<ul style="list-style-type: none"> • Equestrian BMPs • Swales, filter strips, biofiltration along riding areas • Local detention • Local infiltration systems 	<ul style="list-style-type: none"> • Vegetated treatment systems • Local infiltration systems • Street and parking lot biofiltration retrofits • Media filtration 	<ul style="list-style-type: none"> • Perimeter swales and filter strips. • Vegetated treatment systems 	
Regional/Subregional BMPs	<ul style="list-style-type: none"> • Treatment facilities 		<ul style="list-style-type: none"> • Treatment facilities 		<ul style="list-style-type: none"> • Regional detention • Regional infiltration • Regional natural treatment systems 	<ul style="list-style-type: none"> • Regional detention • Regional infiltration • Regional natural treatment systems 	<ul style="list-style-type: none"> • Regional detention • Regional infiltration • Regional natural treatment systems

Table 2-3 Summary of Feasibility Assessment of Evaluated Regional Structural BMPs in the Malibu Creek Watershed

	Infiltration Basin	Free Surface Flow Wetland	Sub-Surface Flow Wetland	Conventional Disinfection
Publicly Owned Sites				
Chumash Park	F	F	F	F
Las Virgenes Creek below 101 Freeway	I	I	I	I
Medea Creek Park	P	P	P	F
Oak Canyon Community Park	I	P	F	F
Reyes Adobe Park	P	P	P	F
Russell Creek at Westlake High School	I	I	I	I
Sumac Park	P	P	P	F
Three Springs Park	P	P	P	F
Triunfo Flood Control Channel	P	P	P	F
Upper Lindero Creek at County Line	P	P	P	F
Privately Owned Sites				
Lake Lindero Country Club	P	P	P	F
Las Virgenes Creek near De Anza Park	P	P	P	F
Liberty Canyon Creek	P	P	P	F
Lower Lindero Creek Subwatershed	I	P	P	F
Lower Medea Creek	I	P	P	F
Upper Lindero Creek Subwatershed	F	P	F	F
Upper Medea Creek Subwatershed	I	P	P	F

* F=Full Concept Storm Capture/Treatment, P=Partial Concept Storm Capture/Treatment, I=Infeasible

2.2 Development of Subwatershed Suites

Subwatershed suites of recommended BMPs have been developed using the watershed priorities and non-structural and structural BMPs developed and evaluated in Tasks 3, 4, and 7, respectively, and feedback from the MCW stakeholders regarding priorities for BMP implementation. Stakeholders helped identify the relative priority (or weightings) of defined criteria as described below. For this task, non-structural and structural BMPs were ranked by using these weightings and the previously developed subwatershed prioritizations. Each BMP received a weighted score on a subwatershed basis allowing for the formation of BMP suites for each watershed prioritization type. A follow-on evaluation was performed to identify specific BMPs of the higher-ranked BMPs to commit to implementing, commit to piloting, or for future consideration.

The evaluation criteria and commit-pilot-consider model are further described in the following section.

2.2.1 BMP Evaluation Criteria

Separate criteria were developed for both non-structural and structural BMPs. The criteria are described below for both non-structural and structural BMPs. This is followed by a description

of the relative importance or weighting of each criterion for evaluating the BMP. The BMP evaluation methodology, applying the criterion weighting, is described in detail in Section 2.2.2.

2.2.1.1 Non-structural Criteria

Three non-structural criteria were used to assist in developing a weighted score for each BMP on a subwatershed basis. These criteria are consistent with other Santa Monica Bay TMDL Implementation Plans and reflect a desire to balance competing criteria, while meeting required objectives.

Cost

For purposes of this technical memorandum the cost criteria includes a relative measure of the costs associated with additional staff time on behalf of implementing agencies and materials and equipment, including both start-up costs, and ongoing operational costs. Costs are reflective of costs to an agency and do not reflect costs assumed by others. A high ranking corresponds to low cost.

Multi-Pollutant

The multi-pollutant criterion measures the ability of a BMP to effectively target more than one pollutant. A low ranking means that a BMP targets fewer pollutants than a high ranking BMP. Three sub-criteria were developed: prioritized pollutants, organics/toxics, and oil and grease. Prioritized pollutants are further broken down into bacteria, nutrients (nitrate), sediments (TSS), trash, and metals. Percent contributions are individually assigned to the prioritized pollutants based on the subwatershed.

Risks

The risk criterion is further subdivided into the following sub-criteria: risk of implementing a BMP and risk of not implementing a BMP. Each non-structural BMP has a risk associated with implementation.

Implementation risks include financial or other burdens placed on businesses, residents, and non-residents; increased level of effort and coordination required on behalf of public agencies; regulatory constraints; public resistance; political issues; and oversaturation of public outreach materials. The higher the implementation risk and the lower the ranking, the less of a chance a BMP will be performed properly and sustained, and consequently the lower the likelihood that the BMP will result in a reduction of bacterial loading.

Not implementing a non-structural BMP also has an associated risk. A lack of implementation can result in an agency not achieving compliance with the Dry- and Wet-weather Bacteria TMDL for the MCW and/or the applicable NPDES permit. By not implementing a BMP that targets a source associated with high bacterial loading, for example, the risk of not achieving compliance with the TMDL would be increased. The risk of not implementing can be generally equated to an estimate of the relative effectiveness of a BMP. A higher ranking means that the risk of not implementing a BMP is high.

BMP Criteria Weighting

The criteria categories were weighted using stakeholder input regarding the relative importance of cost, risk, and multi-benefit (multi-pollutant) for each subwatershed priority. The general weighting scheme was decided with the Stakeholders in a meeting on June 13, 2006. Table 2-4 presents the weighting percentages, as gathered from stakeholder feedback, applied to each criterion for each of the three subwatershed prioritizations.

Table 2-4 Nonstructural BMP Weighting Criteria by Subwatershed Priority

Low Priority		Medium Priority		High Priority	
Criteria	Percentage	Criteria	Percentage	Criteria	Percentage
Low Risk	25%	Low Risk:	33%	Low Risk:	45%
Low Cost:	50%	Low Cost:	33%	Low Cost:	10%
Multi-Benefit:	25%	Multi-Benefit:	33%	Multi-Benefit:	45%
100%		100%		100%	

Table 2-5 illustrates the percentages assigned to the sub-criteria

Table 2-5 Nonstructural BMP Sub-Criteria Weighting

Nonstructural BMPs	
Cost	
Total Costs	100%
100%	
Multi-Pollutant	
- Prioritized Pollutants	90%
Bacteria	Percent contribution for each individual pollutant group determined on a subwatershed by subwatershed basis.
Nutrients (Nitrate)	
Sediments (TSS)	
Trash	
Metals	
- Organics/Toxics	5%
- Oil and Grease	5%
100%	
Risks	
Risk of Implementing	50%
Risk of Not Implementing	50%
100%	

Additional information on the criteria weighting calculations and application of the weight percentages can be found below in Section 2.2.2.

2.2.1.2 Structural Criteria

Four structural criteria were used to assist in developing a weighted score for each BMP on a subwatershed basis - cost, effectiveness, implementability, and other factors/environmental. These criteria were established to be consistent with the *Los Angeles County-Wide Structural BMP Prioritization Methodology* developed jointly by Heal the Bay, the County of Los Angeles, the City of Los Angeles, and GeoSyntec Consultants.

Cost

The cost criteria includes: design and installation costs, land acquisition costs, O&M costs, and replacement costs. Two sub-criteria were developed: capital and O&M costs. Costs are evaluated on per unit costs for both capital and O&M costs. Planning level cost estimates were developed for both the distributed and regional BMP families in TM 7.2. These cost estimates serve as the basis for ranking structural BMPs. A BMP that has a low per unit capital and O&M cost would receive a high score.

Effectiveness

The effectiveness criterion measures the effectiveness of a particular BMP with based on a number of sub-criteria. Effectiveness is impacted by the amount of flow that can be treated within the space available, as well as removal rates for pollutants. Four sub-criteria were developed: effluent concentration by pollutant group, other pollutants (toxics and bioaccumulators), volume mitigation, and reliability. Effluent concentration by pollutant group is broken down into the following pollutants: trash, nutrients (nitrate), metals, bacteria, and sediments (TSS). Percent concentrations are individually assigned based on the subwatershed. The other pollutants sub-criterion measures the ability of a BMP to reduce toxics and chemicals that bioaccumulate in the environment. Volume mitigation is the ability of a BMP to reduce runoff volumes. Reliability represents a measure of the ability of the alternatives to consistently meet bacteria TMDL regulations. A low ranking for any of the sub-criteria indicates low effectiveness of the BMP.

Implementation

The implementability of a BMP is among the most important of the factors considered in the selection process. A strategy can appear to be the most appropriate in terms of cost and effectiveness, but if it cannot be reasonably implemented, the strategy may not be feasible. Implementation is a measure of the ability of a project to be completed. The higher the ranking the more likely a project will result in successful implementation. This criterion is divided into two main sub-criteria: implementation issues and safety of the public.

Implementation issues are further sub-divided into: engineering/siting feasibility, ownership/right of way/ jurisdictions, environmental clearance, and permitting and water rights and safety:

- Engineering/siting feasibility is a measure of the ability of a BMP to be designed to properly work given constraints, such as, but not limited to, area of land available, hydrology, and geology.
- Ownership of land, the ability to use right of ways, and jurisdictional location of BMPs is critical to the successful siting of structural BMPs. Stakeholders have indicated they are not willing to use eminent domain to site BMPs on land owned by unwilling sellers.
- Environmental clearance is necessary for all BMPs. Implementation of a BMP may be more difficult depending on environmental impacts that the project may cause. Construction in sensitive ecological areas is not permissible. BMPs may impact endangered species, aggravate groundwater quality problems, or cause erosion if not properly sited.
- Permitting and water rights issues are also key to successfully implementing a BMP. All projects must be able to obtain all permits required for construction. BMPs that impinge upon existing water rights by removing surface flows or altering ground water flows will reduce the ability of a project to be successfully implemented.

Safety of the public may impact the successful implementation of a BMP. BMPs must be adequately sited and designed to prevent dangers to the public, including but not limited to property damage, personal injuries, or death in the case of accidental drownings. BMPs that present dangers to the public are ranked lower.

Environment/Other Factors

The environment/other factors criteria are a measure of a BMP to create both benefits and potential impacts. Benefits and potential impacts are sub-criteria. Benefits of BMPs would include integrated resource management or beneficial reuse. Beneficial reuse would result in the reuse of runoff for irrigation or groundwater recharge, if feasible, reducing demands on imported potable water. Other potential BMPs resulting in beneficial reuse would receive higher rankings than those BMPs that do not have a reuse component. BMPs can also result in potential impacts such as the creation of vector sources.

BMP Criteria Weighting

The criteria categories were weighted using stakeholder input regarding the relative importance of cost, risk, and multi-beneficial use for each subwatershed priority. The general weighting scheme was decided with the Stakeholders in a meeting on June 13, 2006. The relation of the criteria above to the cost, risk, and multi-benefit criteria discussed at the Stakeholder Meeting on June 13 is as follows:

Cost : Cost

Effectiveness and Implementability : Risk

Environment/Other Factors : Multi-benefits

Table 2-6 presents the weighting percentages as gathered from stakeholder feedback, applied to each criterion for each of the three subwatershed prioritizations. Effectiveness and implementation were considered equally as part of the risk of implementing or not implementing a BMP.

Table 2-6 Structural BMP Criteria Weighting by Subwatershed Priority

Low Priority		Medium Priority		High Priority	
Criteria	Percentage	Criteria	Percentage	Criteria	Percentage
Effectiveness	15%	Effectiveness	25%	Effectiveness	35%
Implementation	15%	Implementation	25%	Implementation	35%
Low Cost:	50%	Low Cost:	25%	Low Cost:	10%
Multi-Benefit:	20%	Multi-Benefit:	25%	Multi-Benefit:	20%
100%		100%		100%	

Table 2-7 illustrates the percentages assigned to the sub-criteria, for each of the three families of BMPs. These percentages were initially developed by the Consultant Team and modified to be consistent with agency stakeholder priorities, and reflect a consensus of the stakeholder representatives.

**Table 2-7
 Structural BMP Category Sub-Criteria Weighting by BMP Family**

	Institutional	Distributed	Regional
Cost			
– Capital	40%	40%	40%
– Operations and Maintenance	60%	60%	60%
<i>Total Maximum for Cost Category</i>	100%	100%	100%
Effectiveness			
– Effluent Conc. (by pollutant group)	40%	50%	55%
Trash	Percent contribution for each individual pollutant group determined on a subwatershed by subwatershed basis.		
Nitrate			
Metals			
Bacteria			
TSS			
– Other Pollutants (toxicity, bioaccum.)	2.5%	5%	5%
– Volume Mitigation	40%	35%	30%
– Reliability	17.5%	10%	10%
<i>Total Maximum for Effectiveness Category</i>	100%	100%	100%
Implementation			
– Implementation Issues			
Engineering/Siting/ROW/Ownership	10%	30%	50%
Expected extent of implementation	60%	30%	10%
Environmental Clearance	10%	20%	20%
Permitting, Water Rights	5%	10%	10%
– Safety (Public)	15%	10%	10%
<i>Total Maximum for Implementation Category</i>	100%	100%	100%
Environment/Other Factors			
– Other Potential Benefits (eg, conservation)	60%	60%	60%
– Other Potential Impacts (eg, vectors)	40%	40%	40%
<i>Total Maximum for Other Category</i>	100%	100%	100%

2.2.2 BMP Evaluation Methodology

The evaluation methodology for developing a “short list” of BMPs for further consideration of inclusion in the implementation plan was as follows:

Step 1 - Evaluate the BMPs performance relative to each criterion

For each criteria element, each individual BMP was scored on a scale of 1 to 5, with a score of 1 being a low or undesirable score, and a score of 5 being a high or desired score. The unweighted scores for each structural BMP were determined based on the information presented in TM 7.2 and 7.3, stakeholder feedback, and on best available information. The unweighted scores for each nonstructural BMP were determined based on the information presented in TM 4.4, stakeholder feedback, and on best available information.

Step 2 - Applying the appropriate weighting to the criterion

Instead of a straight average of all unweighted scores being applied uniformly to all subwatersheds, the percent weights described above in Section 2.2.1 were used based on BMP type, subwatershed priority, and subwatershed specific estimated pollutant loadings. First the subwatershed priority was used to determine the overall criteria percentage to be used as presented above in Table 2-4 for nonstructural BMPs and Table 2-6 for Structural BMPs. These main criteria weightings were applied to the specific sub-criteria weightings, including the watershed specific pollutant weightings.

These percent weightings were multiplied by the corresponding unweighted scores. The weighted scores were totaled across all criteria to arrive at a total, weighted score for a specific BMP. Table 2-8 below shows an example calculation for one nonstructural BMP in a high priority subwatershed.

Step 3 - Select the BMPs

Generally, those BMPs with an overall score of 3.0 or higher for a subwatershed were continued on for further consideration and analysis using the commit-pilot-consider model presented below in Section 2.3. Those BMPs with a score of less than 3.0 are being tabled for future consideration.

**Table 2-8
 Example of BMP Weighting Process**

Example Subwatershed: Westlake Subwatershed (High Priority) Example Non-Structural BMP: Residential BMP "Savings Fund"					
Criteria/Subcriteria	Total Criteria Weighting	Subcriteria Weighting	Overall Weighting	Unweighted Score	Weighted Score
Potential Pollutants (Multi-Benefit/Pollutant)					
Bacteria		36%	16.0%	3	0.5
Nutrients		22%	9.7%	3	0.3
Sediments		5%	2.3%	3	0.1
Trash/Debris	45%	14%	6.4%	3	0.2
Metals		13%	6.1%	3	0.2
Organics/Toxics		5%	2.3%	3	0.1
Oil and Grease		5%	2.3%	3	0.1
Cost					
Low Cost	10%	100%	10.0%	2	0.2
Risk					
Risk of Implementing		50%	22.5%	3	0.7
Risk of Not Implementing (Relative Effectiveness)	45%	50%	22.5%	4	0.9
Total Score:					3.1

2.3 Commit-Pilot-Consider Model

A commit-pilot-consider model was developed to evaluate the implementation requirements and potential effectiveness associated with each BMP. The approach was most directly applied to non-structural BMPs, but can be applied to structural approaches as well.

Three levels of implementation are proposed in this Implementation Plan:

Commit: Agencies commit to engaging in the activities so designated within the indicated time frame. Activity effectiveness of any BMP program or project will be periodically evaluated and reassessed for maximum cost benefit. Other factors may be considered as well in this re-evaluation. Though not the intent, it is recognized that commitment to an item may go only as far as a feasibility analysis if the results of that analysis are unfavorable toward removing impairments. Through the iterative-adaptive process some commitments may prove to be unnecessary and therefore not carried out. For purposes of this Implementation Plan and the predicted effectiveness of implementation, it is assumed that "Commit"-designated projects will be implemented.

Pilot: Agencies commit to a feasibility analysis or limited scale implementation to establish the overall effectiveness (including factors such as cost) of the measure (structural and non-structural) and to help identify the severity of the potentially targeted source (for non-structural solutions).

Consider: If the perceived need for this BMP, based on preliminary studies and early implementation, is not apparent, or if the subject technology is potentially costly or unproven, these activities will be considered in future phases of implementation. "Consider" designated projects will not have an assumed level of implementation for effectiveness assessment purposes.

In general, the basis for determining the appropriate level of implementation is illustrated in Tables 2-9, 2-10 and 2-11 below. The commit-pilot-consider model varies for each subwatershed priority to account for different needs and focuses within the different prioritized subwatersheds.

Table 2-9

Commit-Pilot-Consider Model – High Priority Subwatersheds.

		Implementation Requirements Rating		
		Difficult	Moderate	Easy
Potential Effectiveness Rating (Risk of Not Implementing) ¹	High	Pilot	Commit	Commit
	Medium	Consider	Pilot	Commit
	Low	Consider	Consider	Consider

Table 2-10

Commit-Pilot-Consider Model – Medium Priority Subwatersheds.

		Implementation Requirements Rating		
		Difficult	Moderate	Easy
Potential Effectiveness Rating (Risk of Not Implementing)	High	Consider	Pilot	Commit
	Medium	Consider	Pilot	Pilot
	Low	Consider	Consider	Consider

¹ For purposes of Tables 2-9, 2-10, and 2-11, effectiveness is ranked high-medium-low. This is a relative ranking within the set of BMPs that have been proposed for consideration and that were deemed potentially effective.

Table 2-11

Commit-Pilot-Consider Model – Low Priority Subwatersheds.

		Cost Rating		
		Difficult	Moderate	Easy
Potential Effectiveness Rating (Risk of Not Implementing)	High	Consider	Pilot	Pilot
	Medium	Consider	Consider	Pilot
	Low	Consider	Consider	Consider

This approach of subwatershed focusing and using a commit-pilot-consider model was generally used to identify the projects and programs for inclusion in the Implementation Plan discussed in Section 3. In some cases other factors were considered in identifying a BMP for commitment piloting or consideration:

Dry Weather BMPs- Subwatersheds were evaluated separately for dry-weather BMPs. BMPs that had higher scores for dry-weather flow sources were identified as commit or pilot and included in the overall dry- and wet-weather recommendations.

Watershed-Wide BMPs - A number of BMPs have been identified to support overall improvement in watershed BMP implementation. These BMPs were also evaluated and the top ranking BMPs identified for implementation at a commit or pilot scale in all jurisdictions.

2.4 Ranking of Regional Structural BMPs

Regional Structural BMPs were reviewed on a subwatershed basis and ranked for order of consideration for implementation. The weighting of cost, effectiveness, implementation, and other factors (as described above) for each BMP type (treatment facilities, regional detention, infiltration, natural treatment systems) along with the site-specific analyses presented in TM 7.3 were used as the basis for evaluation as follows:

1. Those BMPs (treatment facilities, and regional detention) eliminate through the initial evaluation scoring and commit-pilot-consider were eliminated from further consideration.
2. Those BMPs remaining (infiltration and natural treatment) were further evaluated and ranked based on estimated effectiveness. Estimated BMP costs were preliminarily evaluated, and all appeared reasonably close, so cost was not considered further with respect to ranking of BMP opportunities.
3. Effectiveness was estimated based on the amount of water, as measured by flow in cubic feet per second, that could be managed/treated at the individual location by each type of BMP

4. The BMP type and locations that could affect the greatest flows were generally ranked highest for initial consideration.

A number of local factors need to be considered for final ranking of BMPs for pilot studies, including, but not limited to:

- Loss or creation of recreation opportunities
- Land ownership – some apparently favorable opportunities are on privately owned land
- Plans for future use of the lands
- Feasibility of BMP implementation
- Feasibility of implementing stream enhancements for nearby receiving waters in conjunction with any regional BMP pilot study.

3.0 Identification of Projects and Programs for Inclusion in Implementation Plan

Based on the evaluation of BMPs using the methodology previously discussed, a suite of BMPs for each subwatershed prioritization type (high, medium, and low) was developed for consideration for inclusion in the Implementation Plan. All subwatersheds of a specific priority will ultimately have similar suites, although they may not be identical as a result of subwatershed specific factors, such as pollutants of concern, the environment, physical implementation restrictions, and land use. The land-use of each subwatershed was taken into account when selecting BMPs. Additional BMPs may be included or excluded for subwatersheds of a similar prioritization based on the types of land-use in the area.

The elements contained in the plan for the three subwatershed types include those that are recommended for committing either for full implementation or initial pilot programs/projects with implementation subject to the results of the pilots. Other measures may be considered at some point in the future depending upon the effectiveness of the committed and pilot programs or in response to specific opportunities that may be presented but are not part of the initial commitments.

Table 3-1 below presents the weighted scores for each individual dry- and wet- weather non-structural and structural BMP by subwatershed. Table 3-2 below presents the suites of dry- and wet- weather non-structural and structural BMPs that are recommended for incorporation into the Implementation Plan for each subwatershed. The recommendations in this table are based on the Commit-Pilot-Consider model presented above in Section 2.3, and on responsible agency feedback. Table 3-3 below presents only the suite of dry-weather non-structural and structural BMPs that are recommended for incorporation into the Implementation Plan for each subwatershed. Table 3-4 presents only the Malibu Creek Watershed-wide BMPs recommended

for incorporation into the Implementation Plan. As these are BMPs that required watershed-wide participation, these recommended BMPs will generally be implemented at the same level for all subwatersheds. All of these tables identify BMPs, the weighted score, along with a recommendation to “commit”, “pilot”, or “consider”. Table 3-5 presents summarized data and recommended rankings for considering Regional BMPs by subwatershed.

**Table 3-1
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?	
Nonstructural BMPs																					
Residential General Public																					
General/Residential Education Programs																					
Partnerships with HOAs to Increase Impressions and Promote Water Quality and Water Conservation	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.9	3.9	3.9	3.9	3.9	4.2	4.2	4.2	X		
Offer Water Conservation, and Water Quality in Existing Educational Programs at Schools	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		X	
Outreach Fact Sheets on Water Quality for Point-of-Sale Distribution	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	4.0	4.0	4.0	4.0	4.0	4.3	4.3	4.3		X	
Include Billing Inserts with Water Quality Messages	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	4.1	4.1	4.1		X	
Residential BMP "Savings Fund"	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	2.8	2.8	2.8	2.8	2.8	2.6	2.6	2.6			
Work with LVMWD, WBMWD, and WWD 29 to Support/Expand Water Audit and Conservation Programs	3.1	3.1	3.2	3.1	3.1	3.2	3.1	3.3	3.3	3.2	3.2	3.2	3.2	3.1	3.2	3.2	3.1	3.1		X	
Develop a Watershed Awareness Campaign Incorporating Key Outreach Elements to Address Pollutant Impairments in the NSMBW	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	X	X	

**Table 3-1
 Non-Structural BMP Alternatives Analysis
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Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Develop a Clean Water Program for Residents and Businesses Based similar to City of Malibu Program	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	X	
Mailers or point-of-sale outreach regarding proper pool drainage	2.8	2.8	2.8	2.8	2.7	2.7	2.9	2.9	2.7	2.7	3.3	3.2	3.3	3.4	3.3	3.8	3.8	3.8	X	
Adopt-a-Waterway	2.5	2.5	2.4	2.5	2.5	2.4	2.5	2.3	2.3	2.4	3.0	3.0	3.1	3.1	3.0	3.5	3.6	3.5		
Horse, Confined Animals, Pets																				
Horse Stables and Confined Animal Facility Outreach and Education	3.9	3.8	3.9	3.9	3.9	3.9	3.8	3.9	4.0	3.9	4.2	4.3	4.2	4.2	4.2	4.4	4.4	4.4	X	
Outreach to Pet Owners Linking Waste to Water Quality Impairments	3.1	3.1	3.1	3.1	3.1	3.2	3.0	3.2	3.3	3.3	3.8	3.8	3.7	3.6	3.7	4.0	4.0	3.9		
Place Pet Waste Bag Dispensers at Trailheads	3.0	3.0	3.0	3.1	3.1	3.1	2.9	3.0	3.1	3.1	3.6	3.7	3.6	3.5	3.6	3.9	3.9	3.9		
Develop an Inventory of Areas with Confined Animals and Educate Property Owners on Water Quality Impairments and BMPs (combine with commercial inventory effort)	3.0	3.0	3.0	3.0	3.1	3.1	2.9	3.0	3.1	3.1	3.4	3.4	3.3	3.3	3.3	3.5	3.5	3.5	X	

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Post Signs at City and County-owned Trailheads for Equestrian Users Emphasizing Clean-up of Manure in Parking Lots	3.1	3.1	3.1	3.1	3.2	3.2	3.0	3.1	3.2	3.2	3.7	3.7	3.7	3.6	3.7	4.0	4.0	4.0	X	
Pilot Program for Commercial Horse Stables and Equestrian Centers with Pre- and Post-BMP Sampling	2.8	2.7	2.8	2.8	2.8	2.8	2.7	2.8	2.9	2.8	2.9	2.9	2.9	2.8	2.9	2.9	2.9	2.9		
Install Doggy Loos or Pooch Patches at Parks/Recreation Facilities	2.6	2.6	2.7	2.7	2.7	2.8	2.5	2.7	2.9	2.8	2.9	3.0	2.9	2.8	2.9	2.9	2.8	2.8		
Visitors/Recreation																				
Recreational Vehicle (RV) Disposal Site Outreach Program	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	4.0	4.0	4.0	4.0	4.0	4.3	4.3	4.3	X	
Coordinate with watershed agencies to identify methods to reach visitors to the watershed	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1	X	
Outreach at Trailheads Regarding Waste Disposal and Restroom Use	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.8	3.8	3.8	3.8	3.8	4.1	4.1	4.1	X	

**Table 3-1
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Score Comparison**

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BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
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Industrial/Commercial																				
Outreach Programs																				
Coordinate Meetings Between Agencies and Environmental Organizations for Preparing Outreach Materials	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.8	3.8	3.8	X	X
Trash Hauler Outreach	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.8	3.8	3.8	3.8	3.8	4.1	4.1	4.1		
Develop Targeted Outreach for Businesses with Greatest Potential to Contribute Pollutants of Concern (including Restaurants, Automotive, Equestrian, Industrial, Landscape Maintenance, Mobile Businesses)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1	X	
Expand Media Partnership with Caltrans	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1		X
Work with LVMWD, WBMWWD, and WWD 29 to Support/Expand Water Audit and Conservation Programs	3.1	3.1	3.2	3.1	3.1	3.2	3.1	3.3	3.3	3.2	3.2	3.2	3.2	3.1	3.2	3.2	3.1	3.1	X	
Assure Inspection Consistency Across Jurisdictions	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9		X
Enhance Lines of Communication with Agricultural Community	2.1	2.1	2.3	2.1	2.0	2.4	2.2	2.7	2.7	2.4	3.0	2.9	2.7	2.9	2.8	3.4	3.2	3.2	X	

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Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Inspection/Enforcement																				
Develop Minimum Requirements and Program to Enforce Parking Lot Street Sweeping for Commercial Businesses	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1		
Modify Inspection Staff Training to Include Enhanced Training on Water Quality Impairments and BMPs	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.7	3.7	3.7	3.7	3.7	4.0	4.0	4.0		
Increase Inspection Frequency or Enhance Inspection Frequency by Adding Education Visits	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Increase Frequency of Trash Pickups at Food Facilities with Excess Trash	2.9	2.9	2.9	3.0	3.0	3.0	2.8	2.9	3.0	3.0	3.6	3.6	3.5	3.5	3.5	3.9	3.8	3.8		
Combine BMP Inspections with Health Inspections for Restaurants	2.8	2.8	2.8	2.9	2.9	2.9	2.7	2.8	2.9	2.9	3.2	3.3	3.2	3.1	3.2	3.4	3.3	3.3		
Implement Joint Inspections with RWQCB	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.3	3.3	3.3	3.3	3.3	3.8	3.8	3.8		
Adopt a Watershed-Wide Uniform Fine Structure and Method to Facilitate Enforcement of BMP Requirements	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.2	3.2	3.2	3.2	3.2	3.6	3.6	3.6		X

**Table 3-1
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Incentive Programs																				
Send Thank You Letters to Businesses that are in Compliance with BMPs	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5	3.5	3.9	3.9	3.9		
Develop a Reward/Stewardship Program for Businesses	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1		
Establish a BMP Grading System for Businesses similar to Dept of Public Health ratings.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		X
New Development/Redevelopment																				
Construction																				
During Inspections Increase Emphasis on BMPS that Reduce Pollutants of Concern	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	4.0	4.0	4.0	4.0	4.0	4.3	4.3	4.3		
Enhance Construction Contractor Education	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1		
Increase Frequency of Inspections During Construction	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.7	2.7	2.7	2.7	2.7	2.5	2.5	2.5		
Planning																				
Incorporate TMDL requirements into CEQA process	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	4.0	4.0	4.0	4.0	4.0	4.3	4.3	4.3		

**Table 3-1
 Non-Structural BMP Alternatives Analysis
 Watershed-Wide Dry- and Wet-Weather
 Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Chreek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Improve Use of Initial Study Guidelines and Conditions of Approval to Support the BMP Selection Process through Agency Personnel Education	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6		
Increase Inspections of Post-Development BMPs	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1		
Enhance Education for Developers of Projects outside SUSMP/SQUMP requirements	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1		
Develop vegetative filter BMP	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.5	3.5	3.5	3.7	3.7	3.6	3.6	3.6	3.7	3.7	3.7		X
Complete BMP Technical Manual and Include Detailed BMP Requirements Related to Water Quality Impairments	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	2.8	2.8	2.8	2.8	2.8	2.6	2.6	2.6		X
Incentive Programs																				
Develop seal of approval for new projects that incorporate dry- and wet-weather reductions in runoff into proposed projects	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.7	2.7	2.7	2.7	2.7	2.5	2.5	2.5	X	X

**Table 3-1
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Chreek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Develop Similar Program to Santa Monica Green Building Program (Stormwater Management Performance Ordinance)	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.7	2.7	2.7	2.7	2.7	2.5	2.5	2.5	X	X
Public Agency Activity Programs																				
Program Consistency and Streamlining																				
Standardize IC/ID Training, Inspection, and Reporting Methods throughout the Watershed	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.2	3.2	3.2	3.2	3.2	3.4	3.4	3.4	X	X
Develop a Watershed-Wide Common Database and Map of Storm Drain Structures	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9		X
Watershed Inventory of Potential Pollutant-Causing Facilities/Activities	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9		X
Watershed Database Program to Standardize and Facilitate Monitoring of BMP Inventories	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9		X
Evaluate and Update Street and Road Maintenance BMP Programs to Assure Consistency Across Jurisdictions.	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.2	3.2	3.2	3.2	3.2	3.4	3.4	3.4		X

**Table 3-1
 Non-Structural BMP Alternatives Analysis
 Watershed-Wide Dry- and Wet-Weather
 Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Activity Improvement																				
Emergency Spill Management - Review Existing Emergency Operation Plans on a Regular Schedule; assure availability of emergency equipment during peak traffic hours	3.6	3.6	3.6	3.6	3.6	3.7	3.6	3.7	3.8	3.7	4.1	4.1	4.0	4.0	4.1	4.3	4.2	4.2	X	
Additional Trash Pick Up During High Use Periods in High Use Sites	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6		
Assure that Contractors Providing Maintenance and Landscape Services Adhere to BMPs Through Contract Language and Inspections	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6		
Establish Optimal Cleaning Cycles for Drainage Facilities	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	2.8	2.8	2.8	2.8	2.8	2.6	2.6	2.6		
Street Sweeping Enhancement/Pilot Program - Investigate Street Sweeping Practices & Equipment Improvements; and Standardize Prioritized Sweeping Schedule for All Jurisdictions	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		

**Table 3-1
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Chreek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Require SWPPP/WPCP for all construction projects	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	1.9	1.9	2.2	2.1	2.2	2.3	2.2	2.4	2.5	2.5		
Onsite Wastewater Treatment Systems																				
Residential Programs																				
Voluntary Septic Inspection and Maintenance Program	2.6	2.6	2.6	2.7	2.7	2.8	2.5	2.7	2.9	2.8	3.4	3.5	3.4	3.3	3.4	3.8	3.7	3.7	X	
Provide Septic System (OWTS) Pumpers and Customers with Septic System Guides	3.1	3.1	3.1	3.1	3.1	3.2	3.0	3.2	3.3	3.3	3.8	3.8	3.7	3.6	3.7	4.0	4.0	3.9	X	
Sewage Systems Maintenance, Overflow, Spill Prevention, and Septic																				
Investigate Incentive Programs for Replacing Improperly Operating Septic Tanks	2.8	2.8	2.9	2.9	2.9	3.0	2.7	2.9	3.1	3.0	3.6	3.7	3.5	3.4	3.6	3.9	3.8	3.8	X	
Septic Inspections Upon Change in Ownership	2.9	2.9	2.9	2.9	2.9	3.0	2.8	3.0	3.1	3.1	3.1	3.2	3.0	2.9	3.1	3.0	3.0	2.9	X	
Structural BMPs																				
Institutional																				
Development Standards	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.5	3.5	3.5	X	
Downspout Redirect Program	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.4	3.4	3.4		
Stream Buffers	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8		
Commercial and industrial area retrofit program	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	2.9	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9		
Horse farm retrofit program	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.4	3.4	3.4	X	
Distributed																				
Local Detention	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.9	3.9	3.9		
Vegetated treatment systems	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.7	3.7	3.7	X	

**Table 3-1
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Score Comparison**

Score (1=worst - 5=best)

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Chreek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?
Local infiltration systems	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.3	3.3	3.3	3.3	3.0	3.0	3.0	X	X
Street and parking lot biofiltration retrofits	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8		
Media Filtration	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.7	2.7	2.7	2.8	2.8	2.8	3.0	3.0	3.0		
Hydrodynamic Separators	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.7	3.0	3.0	3.0		
Catch Basin Filters	2.7	2.7	2.6	2.7	2.7	2.6	2.7	2.6	2.6	2.6	2.8	2.8	2.9	2.9	2.8	3.3	3.3	3.3		
Regional																				
Treatment facilities	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	X	X
Regional detention	3.0	3.0	3.0	3.0	3.0	2.9	3.0	2.9	2.9	2.9	3.0	3.0	3.1	3.1	3.0	3.2	3.2	3.2		
Regional infiltration	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.4	3.4	3.4	3.4	3.4	3.0	3.0	3.0		
Regional natural treatment system	3.1	3.1	3.2	3.1	3.1	3.2	3.2	3.3	3.3	3.2	3.4	3.4	3.3	3.4	3.3	3.5	3.4	3.4	X	X

**Table 3-2
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations				
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed-wide?			
Nonstructural BMPs																							
Residential General Public																							
General/Residential Education Programs																							
Partnerships with HOAs to Increase Impressions and Promote Water Quality and Water Conservation	Pilot										Pilot						Pilot			X			
Offer Water Conservation, and Water Quality in Existing Educational Programs at Schools	Pilot										Pilot						Pilot			X			
Outreach Fact Sheets on Water Quality for Point-of-Sale Distribution	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot						Pilot			X			
Include Billing Inserts with Water Quality Messages																						X	
Residential BMP 'Savings Fund'																							
Work with LVMWD, WBMWD, and WWD 29 to Support/Expand Water Audit and Conservation Programs	Pilot										Consider	Consider	Consider	Consider		Consider	Consider	Consider	X				
Develop a Watershed Awareness Campaign Incorporating Key Outreach Elements to Address Pollutant Impairments in the NSMBW																			X	X			
Develop a Clean Water Program for Residents and Businesses Based similar to City of Malibu Program																			X				
Mailers or point-of-sale outreach regarding proper pool drainage																			X				
Adopt-a-Waterway																							

**Table 3-2
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed-wide?
Horse, Confined Animals, Pets																				
Horse Stables and Confined Animal Facility Outreach and Education	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit		Consider	Consider	Consider	X	
Outreach to Pet Owners Linking Waste to Water Quality Impairments	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Consider	Consider	Consider	Consider		Consider	Consider	Consider		
Place Pet Waste Bag Dispensers at Trailheads	Pilot										Consider	Consider	Consider	Consider		Consider	Consider	Consider		
Develop an Inventory of Areas with Confined Animals and Educate Property Owners on Water Quality Impairments and BMPs (combine with commercial inventory effort)	Pilot										Consider	Consider	Consider	Consider		Consider	Consider	Consider	X	
Post Signs at City and County-owned Trailheads for Equestrian Users Emphasizing Clean-up of Manure in Parking Lots	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		
Pilot Program for Commercial Horse Stables and Equestrian Centers with Pre- and Post-BMP Sampling																			X	
Install Doggy Loos or Pooch Patches at Parks/Recreation Facilities																				
Visitors/Recreation																				
Recreational Vehicle (RV) Disposal Site Outreach Program	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	X		
Coordinate with watershed agencies to identify methods to reach visitors to the watershed	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	X		

**Table 3-2
 Non-Structural BMP Alternatives Analysis
 Watershed-Wide Dry- and Wet-Weather
 Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed-wide?	
Outreach at Trailheads Regarding Waste Disposal and Restroom Use	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		X	
Industrial/Commercial Outreach Programs																					
Coordinate Meetings Between Agencies and Environmental Organizations for Preparing Outreach Materials	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit		Commit	Commit	Commit	Commit	Commit	Commit	X	X	
Trash Hauler Outreach	Pilot										Pilot		Pilot				Pilot				
Develop Targeted Outreach for Businesses with Greatest Potential to Contribute Pollutants of Concern (including Restaurants, Automotive, Equestrian, Industrial, Landscape Maintenance, Mobile Businesses)	Pilot										Consider		Consider	Consider	Consider		Consider	Consider	X		
Expand Media Partnership with Caltrans	Pilot										Pilot		Pilot				Pilot				X
Work with LVMWD, WBMWD, and WWD 29 to Support/Expand Water Audit and Conservation Programs	Pilot										Consider		Consider	Consider	Consider		Consider	Consider	X		
Assure Inspection Consistency Across Jurisdictions																				X	
Enhance Lines of Communication with Agricultural Community																			X		

**Table 3-2
 Non-Structural BMP Alternatives Analysis
 Watershed-Wide Dry- and Wet-Weather
 Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed-wide?	
Inspection/Enforcement																					
Develop Minimum Requirements and Program to Enforce Parking Lot Street Sweeping for Commercial Businesses					Pilot							Consider		Consider	Consider	Consider		Consider	Consider		
Modify Inspection Staff Training to Include Enhanced Training on Water Quality Impairments and BMPs					Pilot							Consider		Consider	Consider	Consider		Consider	Consider		
Increase Inspection Frequency or Enhance Inspection Frequency by Adding Education Visits																					
Increase Frequency of Trash Pickups at Food Facilities with Excess Trash																					
Combine BMP Inspections with Health Inspections for Restaurants																					
Implement Joint Inspections with RWQCB																					
Adopt a Watershed-Wide Uniform Fine Structure and Method to Facilitate Enforcement of BMP Requirements																					X
Incentive Programs																					
Send Thank You Letters to Businesses that are in Compliance with BMPs																					
Develop a Reward/Stewardship Program for Businesses	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		Consider		Consider	Consider	Consider		Consider	Consider			

**Table 3-2
 Non-Structural BMP Alternatives Analysis
 Watershed-Wide Dry- and Wet-Weather
 Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed-wide?
Establish a BMP Grading System for Businesses similar to Dept of Public Health ratings.																				X
New Development/Redevelopment Construction																				
During Inspections Emphasize BMPS that Reduce Pollutants of Concern	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot					Pilot				
Enhance Construction Contractor Education																				
Increase Frequency of Inspections During Construction																				
Planning																				
Incorporate TMDL requirements into CEQA process	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		
Improve Use of Initial Study Guidelines and Conditions of Approval to Support the BMP Selection Process through Agency Personnel Education																				
Increase Inspections of Post-Development BMPs	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		
Enhance Education for Developers of Projects outside SUSMP/SQUMP requirements	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		
Develop vegetative filter BMP	Pilot																			X
Complete LA County BMP Technical Manual and Include Detailed BMP Requirements Related to Water Quality Impairments	Pilot																			X

**Table 3-2
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Water-shed wide?
Incentive Programs																				
Develop seal of approval for new projects that incorporate dry- and wet-weather reductions in runoff into proposed projects																			X	X
Develop Similar Program to Santa Monica Green Building Program (Stormwater Management Performance Ordinance)																			X	X
Public Agency Activity Programs																				
Program Consistency and Streamlining																				
Standardize IC/ID Training, Inspection, and Reporting Methods throughout the Watershed																			X	X
Develop a Watershed-Wide Common Database and Map of Storm Drain Structures																				X
Watershed Inventory of Potential Pollutant-Causing Facilities/Activities																				X
Watershed Database Program to Standardize and Facilitate Monitoring of BMP Inventories																				X
Evaluate and Update Street and Road Maintenance BMP Programs to Assure Consistency Across Jurisdictions.																				X

**Table 3-2
 Non-Structural BMP Alternatives Analysis
 Watershed-Wide Dry- and Wet-Weather
 Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed-wide?	
Activity Improvement																					
Emergency Spill Management - Review Existing Emergency Operation Plans on a Regular Schedule; assure availability of emergency equipment during peak traffic hours	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot					Pilot			X		
Additional Trash Pick Up During High Use Periods in High Use Sites	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		X	
Assure that Contractors Providing Maintenance and Landscape Services Adhere to BMPs Through Contract Language and Inspections	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X		
Establish Optimal Cleaning Cycles for Drainage Facilities	Pilot																				
Street Sweeping Enhancement/Pilot Program - Investigate Street Sweeping Practices & Equipment Improvements; and Standardize Prioritized Sweeping Schedule for All Jurisdictions																					
Require SWPPP/WPCP for all construction projects																					

**Table 3-2
 Non-Structural BMP Alternatives Analysis
 Watershed-Wide Dry- and Wet-Weather
 Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed-wide?
Onsite Wastewater Treatment Systems																				
Residential Programs																				
Voluntary Septic Inspection and Maintenance Program																			X	
Provide Septic System (OWTS) Pumps and Customers with Septic System Guides	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Consider	Consider	Consider	Consider		Consider	Consider	Consider	X	
Sewage Systems Maintenance, Overflow, Spill Prevention, and Septic																				
Investigate Incentive Programs for Replacing Improperly Operating Septic Tanks	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	X	
Septic Inspections Upon Change in Ownership	Consider	Consider	Consider	Consider	Consider	Pilot	Consider	Consider	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Structural BMPs																				
Institutional																				
Development Standards	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot					Consider	Consider	Consider	X	
Voluntary Downspout Redirect Program	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot					Consider	Consider	Consider		
Stream Buffers	Pilot	Commit	Commit	Pilot	Pilot	Commit	Pilot	Pilot	Commit	Commit	Pilot					Consider	Consider	Consider		
Commercial and industrial area retrofit program																				
Voluntary Horse farm retrofit program	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot	Pilot	Pilot	Pilot	Pilot	Consider	Consider	Consider	X	
Distributed																				
Local Detention	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Vegetated treatment systems	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Local infiltration systems	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Street and parking lot biofiltration retrofits	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	X	
Media Filtration																				
Hydrodynamic Separators																				
Catch Basin Filters																				

Table 3-2
Non-Structural BMP Alternatives Analysis
Watershed-Wide Dry- and Wet-Weather
Commit/Pilot/Consider Model

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Water-shed wide?
Regional																				
Treatment facilities	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X
Regional detention	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		X
Regional infiltration	Pilot	Pilot	Pilot*	Pilot	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X
Regional natural treatment system	Pilot	Pilot	Pilot*	Pilot	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X

* Treatment System Currently Planned

**Table 3-3
BMP Alternatives Analysis
Dry-Weather
Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Water-shed wide?	
Nonstructural BMPs																					
Residential General Public																					
General/Residential Education Programs																					
Partnerships with HOAs to Increase Impressions and Promote Water Quality and Water Conservation	Pilot										Pilot						Pilot			X	
Offer Water Conservation, and Water Quality in Existing Educational Programs at Schools	Pilot										Pilot						Pilot			X	
Outreach Fact Sheets on Water Quality for Point-of-Sale Distribution	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot						Pilot			X	
Work with LVMWD, WBMWD, and WWD 29 to Support/Expand Water Audit and Conservation Programs	Pilot										Consider	Consider	Consider	Consider		Consider	Consider	Consider	X		
Horse, Confined Animals, Pets																					
Horse Stables and Confined Animal Facility Outreach and Education	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit		Consider	Consider	Consider	X		
Develop an Inventory of Areas with Confined Animals and Educate Property Owners on Water Quality Impairments and BMPs (combine with commercial inventory effort)	Pilot										Consider	Consider	Consider	Consider		Consider	Consider	Consider	X		
Visitors/Recreation																					
Recreational Vehicle (RV) Disposal Site Outreach Program	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X		

**Table 3-3
 BMP Alternatives Analysis
 Dry-Weather
 Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Water-shed wide?	
Coordinate with watershed agencies to identify methods to reach visitors to the watershed	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Outreach at Trailheads Regarding Waste Disposal and Restroom Use	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Industrial/Commercial																					
Outreach Programs																					
Coordinate Meetings Between Agencies and Environmental Organizations for Preparing Outreach Materials	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit		Commit		Commit	Commit	Commit		Commit	Commit	X	X	
Develop Targeted Outreach for Businesses with Greatest Potential to Contribute Pollutants of Concern (including Restaurants, Automotive, Equestrian, Industrial, Landscape Maintenance, Mobile Businesses)	Pilot											Consider		Consider	Consider	Consider		Consider	Consider	X	
Work with LVMWD, WBMWD, and WWD 29 to Support/Expand Water Audit and Conservation Programs	Pilot											Consider		Consider	Consider	Consider		Consider	Consider	X	
Inspection/Enforcement																					
Incentive Programs																					
New Development/Redevelopment																					
Construction																					
Planning																					
Incentive Programs																					
Public Agency Activity Programs																					
Program Consistency and Streamlining																					
Activity Improvement																					

**Table 3-3
BMP Alternatives Analysis
Dry-Weather
Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Water-shed wide?
Emergency Spill Management - Review Existing Emergency Operation Plans on a Regular Schedule; assure availability of emergency equipment during peak traffic hours	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot					Pilot			X	
Additional Trash Pick Up During High Use Periods in High Use Sites	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Assure that Contractors Providing Maintenance and Landscape Services Adhere to BMPs Through Contract Language and Inspections	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Onsite Wastewater Treatment Systems																				
Residential Programs																				
Provide Septic System (OWTS) Pumps and Customers with Septic System Guides	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Consider	Consider	Consider	Consider		Consider	Consider	Consider	X	
Sewage Systems Maintenance, Overflow, Spill Prevention, and Septic																				
Investigate Incentive Programs for Replacing Improperly Operating Septic Tanks	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	X	
Septic Inspections Upon Change in Ownership	Consider	Consider	Consider	Consider	Consider	Pilot	Consider	Consider	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Structural BMPs																				
Institutional																				
Development Standards	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot					Consider	Consider	Consider	X	
Voluntary Horse farm retrofit program	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Pilot	Pilot	Pilot	Pilot	Pilot	Consider	Consider	Consider	X	
Distributed																				
Local Detention	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	

Table 3-3
BMP Alternatives Analysis
Dry-Weather
Commit/Pilot/Consider Model

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations	
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Water-shed wide?
Vegetated treatment systems	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Local infiltration systems	Pilot										Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	
Street and parking lot biofiltration retrofits	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	X	
Regional																				
Treatment facilities	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X
Regional infiltration	Pilot	Pilot	Pilot*	Pilot	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X
Regional natural treatment system	Pilot	Pilot	Pilot*	Pilot	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X

* Treatment System Currently Planned

**Table 3-4
 BMP Alternatives Analysis
 Non-Structural Watershed-Wide
 Commit/Pilot/Consider Model**

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?	
Nonstructural BMPs																					
Residential General Public																					
General/Residential Education Programs																					
Horse, Confined Animals, Pets																					
Visitors/Recreation																					
Industrial/Commercial																					
Outreach Programs																					
Coordinate Meetings Between Agencies and Environmental Organizations for Preparing Outreach Materials	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit	Commit		Commit		Commit	Commit	Commit		Commit	Commit	X	X	
Expand Media Partnership with Caltrans	Pilot										Pilot		Pilot				Pilot			X	
Inspection/Enforcement																					
Incentive Programs																					
New Development/Redevelopment																					
Construction																					
Planning																					
Develop vegetative filter BMP	Pilot																				X
Complete LA County BMP Technical Manual and Include Detailed BMP Requirements Related to Water Quality Impairments	Pilot																				X
Incentive Programs																					
Public Agency Activity Programs																					
Program Consistency and Streamlining																					
Activity Improvement																					
Onsite Wastewater Treatment Systems																					
Residential Programs																					
Sewage Systems Maintenance, Overflow, Spill Prevention, and Septic																					

Table 3-4
BMP Alternatives Analysis
Non-Structural Watershed-Wide
Commit/Pilot/Consider Model

BMP Name	High Priority Subwatersheds										Medium Priority Subwatersheds					Low Priority Subwatersheds			Additional Considerations		
	Westlake	Lower Lindero Creek	Malibu Lagoon	Upper Lindero Creek	Upper Medea Creek	Lower Las Virgenes Creek	Portrero Canyon Creek	Hidden Valley Creek	Stokes Creek	Lower Medea Creek	Middle Malibu Creek	Lower Malibu Creek	Upper Las Virgenes Creek	Palo Comado Creek	Cheseboro Creek	Upper Malibu Creek	Cold Creek	Triunfo Creek	Dry-Weather Effective?	Watershed wide?	
Structural BMPs																					
Institutional																					
Distributed																					
Regional																					
Treatment facilities	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X	
Regional detention	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider		X	
Regional infiltration	Pilot	Pilot	Pilot*	Pilot	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X	
Regional natural treatment system	Pilot	Pilot	Pilot*	Pilot	Pilot	Pilot	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	Consider	X	X	

* Treatment System Currently Planned

**Table 3-5
Regional BMP Evaluation by Subwatershed**

Subwatershed	Regional BMP Location	Site Concept Storm (1)			Percent Concept Storm Captured per BMP Type (1)			Estimated Flow Rate Managed (2)			Implementation Considerations		Dry or Dry/Wet (4)	Recommended Consideration Priority (5)	Initial BMP Recommendation (5)
		Area [ac] drained	Treatment Rate (WASE) [cfs]	Peak Flow [cfs]	Infiltration Basin	FSF Wetland	SSF Wetland	Infiltration Basin	FSF Wetland	SSF Wetland	Land Ownership	Other considerations			
Westlake	Triunfo Flood Control Channel	1,923	13	61.54	22%	4%	21%	2.86	0.52	2.73	Public		LW/D	1	Infiltration
Westlake	Three Springs Park	1,068	6	43.08	5%	0%	7%	0.30	0.00	0.42	Public		D	2	SSF
U Medea Crk	Medea Creek Park	1,759	5.87	21.91	60%	9%	46%	3.52	0.53	2.70	Public	Potential negative impact on Agoura Hills HS	W/D	1	Infiltration
U Medea Crk	Upper Medea Creek Subwatershed	9,491	32	109.13	0%	1%	7%	0.00	0.32	2.24	Private	Drainage area encompasses entire subwatershed	D	2	SSF
U Medea Crk	Chumash Park	352	2	12.32	100%	100%	100%	2.00	2.00	2.00	Public	Consider FSF wetlands for recreational/education opportunity	W/D	3	FSF
U Medea Crk	Oak Canyon Community Park	541	1.78	10.4	0%	26%	100%	0.00	0.46	1.78	Public		W/D	4	SSF
U Medea Crk	Sumac Park	521	2.8	15.95	37%	6%	31%	1.04	0.17	0.87	Public		W/D	5	Infiltration
U Lindero Crk	Upper Lindero Creek Subwatershed	2,511	10	34.98	100%	18%	100%	10.00	1.80	10.00	Private	Drainage area encompasses entire subwatershed	W/D	1	Infiltration
U Lindero Crk	Upper Lindero Creek at County Line	1,929	8.2	34.72	71%	11%	54%	5.82	0.90	4.43	Public		W/D	2	Infiltration
U Lindero Crk	Lake Lindero Country Club	2,293	9	33.87	20%	3%	16%	1.80	0.27	1.44	Private		D	3	Infiltration
L Medea Crk	Lower Medea Creek	13,746	51	168.78	0%	2%	9%	0.00	1.02	4.59	Private	Downstream & captures flow from Upper Lindero & Upper Medea	W/D	1	SSF
L Lindero Crk	Lower Lindero Creek Subwatershed	4,255	19	59.65	0%	4%	18%	0.00	0.76	3.42	Private	Location receives drainage from entire subwatershed	LW/D	1	SSF
L Lindero Crk	Reyes Adobe Park	361	2	13.61	0%	8%	42%	0.00	0.16	0.84	Public	moderate grade	W/D	2	SSF
L Las Virgenes	Las Virgenes Creek near De Anza Park	9,543	24	76.73	34%	5%	26%	8.16	1.20	6.24	Private	Calabasas has a BMP planned upstream	LW/D	1	Infiltration
L Las Virgenes	Liberty Canyon Creek	902	3	17.74	53%	12%	62%	1.59	0.36	1.86	Private		W/D	2	SSF

Notes

Regional BMPs further described in TM 7.3. Only those BMPs assessed as feasible considered here. Conventional Disinfection not considered because of BMP scoring results. See table XX.

FSF Free Surface Flow

SFS Subsurface Flow

ac acre

WASE Weighted average storm event

cfs cubic feet per second

1 Percent Storm Capture, Site Concept Storm, and Estimated Costs from TM 7.3

2 Estimated flow rate managed = Percent Capture x Treatment Rate

3 Estimated Cost per cfs = estimated flow rate/estimated cost from TM 7.3

4 Dry/Wet suitability based on % of concept storm managed. Less than 30% not considered suitable for wet weather treatment; although those marked LW may have some limited suitability due to the large flows at the location

5 Selection of BMP & type primarily based on estimated flow rate managed. Final selection requires further evaluation of feasibility, flow rate capture, and other factors

4.0 Next Steps

The preliminary recommendations must now be evaluated and contemplated by the agencies in greater detail. Based on the screening methodology detailed above, the range of structural and nonstructural BMPs will be evaluated on a subwatershed by subwatershed basis for all subwatersheds within the MCW. The information provided in this technical memorandum will be used to develop preliminary costs and schedules for the TMDL IP.