Storm Water Panel Report
Deadline: 9/1/06 5pm

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September 1, 2006

VIA EMAIL AND FACSIMILE

California State Water Resources Control Board
Attn: Ms. Song Her
P.O. Box 100
Sacramento, CA 95812-0100

Re: Comment Letter—Storm Water Panel Report

Dear Ms. Her:

On behalf of our client, Playa Capital Company, LLC and its affiliates (collectively "Playa Capital"), we appreciate this opportunity to comment on the Storm Water Panel Report made available to the public on June 21, 2006.[1] We understand from the State Water Resources Control Boards's ("SWRCB") notice for its July 2006 workshops and opening of the comment period on the Panel Report, the SWRCB intended to limit comments at this time to recommendations on how the SWRCB should utilize the Panel Report. However, during the July workshops, the SWRCB indicated that it was expanding the scope of the workshops to include receiving information on the effectiveness of California storm water programs. Accordingly, we address both issues in our comments herein.[2]

A. California Storm Water Programs Are Serving to Materially Reduce and Control Storm Water Pollution.

Certain statements made in the Storm Water Panel Report and at the SWRCB's July workshops suggest that the SWRCB's existing storm water permit programs and policies are not

[1] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 19, 2006) ("Storm Water Panel Report" or "Panel Report").

[2] Because the SWRCB is requesting only limited comments on the Panel Report at this time, we reserve the right to comment further on the substance of the Storm Water Panel Report in the future.

improving water quality as intended.[3] It is our view that the SWRCB's overall regulatory program for storm water is sound, and that the Panel Report is best used to consider adjusting elements of the program. Prior to any rulemaking, permit issuance, or policy determinations, the SWRCB should consider successful storm water management programs in municipalities and at new developments throughout the state. We do not think that the Panel Report justifies a fundamental reshaping of the current storm water programs, because existing programs have already made significant progress in improving water quality and will continue to do so.

1. Municipal storm water quality programs.

There are numerous examples of projects and programs that can be effective at improving water quality. The mixed use, master planned development of Playa Vista in the western portion of Los Angeles has one of these programs. At Playa Vista, Playa Capital has implemented a long-term water quality program that not only manages the flows from the development itself, but also provides water quality enhancement for flows from the surrounding area, and improves previously degraded downstream water bodies and riparian areas. As can be seen from the enclosed documentation prepared pursuant to the California Environmental Quality Act,[4] the water quality Best Management Practices ("BMPs") selected for the Playa Vista development meet or exceed the requirements of the Standard Urban Stormwater Management Plan ("SUSMP")[5] as required by the City of Los Angeles. Playa Vista's BMPs include site design, source control, and treatment control measures that work in concert to address the pollutants of concern expected to be generated by activities at the development site and those pollutants known to exist in the watershed (including pollutants causing impairments in downstream receiving waters).[6] The central element of the water quality program at Playa Vista is an

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[3] By way of example, the Storm Water Panel Report on page 4 states that treatment facilities installed by developers "are designed to minimize the cost and/or area of the facility and/or ease of permitting, not maximize the pollutant removal efficiency and/or flow management of the BMP;" that BMPs are "typically not maintained except for aesthetic purposes;" and that BMPs are improperly selected, designed and/or maintained.

[4] See enclosed chapter IV.C.(2), Water Quality, excerpted from the *Village at Playa Vista Draft EIR*, City of Los Angeles Environmental Impact Report No. ENV-2002-6129-EIR, State Clearinghouse No. 2002111065 (2003).

[5] Municipal storm drain permit implementation programs in the Southern California region, including programs in Orange, Riverside, and San Bernardino, San Diego Counties, all have common elements requiring new development and redevelopment projects implement structural and non-structural BMPs to address anticipated pollutants and hydrologic conditions from the development and to meet specific sizing requirements for treatment devices. The SUSMP is the applicable program in the Los Angeles area.

[6] See attached CEQA documentation §§ 3.1.1 (methodology of impact assessment including all anticipated pollutants of concern), 3.3.1 (descriptions of water quality BMPs, including the natural treatment systems), 3.4.1.2.1 (conformity with SUSMP requirements), and 3.4.1.2.9 (summarizing conclusions that the project will have less than significant effects on downstream surface waters). As discussed in the CEQA documentation, the Playa Vista project meets or exceeds SUSMP requirements as it treats runoff from the Playa Vista project and surrounding

integrated water resource program comprised of an approximately 52-acre natural treatment system (termed the Freshwater Marsh and Riparian Corridor) that: 1) improves the quality of storm water runoff from the Playa Vista project and a large off-site tributary area (including already developed areas), 2) improves water quality in downstream receiving waters, 3) provides ecologically sound flood control facilities, and 4) provides wildlife habitat in an area of previously degraded habitat.

We understand there are many individual projects and municipal water quality programs that effectively manage water quality throughout the state. We do agree that as municipal storm water programs continue to evolve, refinements may be appropriate and that there may be certain elements of the existing municipal programs not yet functioning as they were envisioned by the local agencies. While the municipal storm water programs may merit adjustment, under the existing iterative, BMP-based approaches, numeric limits or benchmarks are not needed to ensure water quality improvements.

2. Construction phase water quality programs.

Construction water quality management at Playa Vista is based on multiple BMPs selected, designed, and maintained to address anticipated pollutants in storm water and non-storm water flows per the requirements of the statewide Construction General Permit. BMPs at the construction site are designed and implemented to address all pollutants of concern at the site, inclusive of sediments and non-sediment pollutants. (See the enclosed excerpts from the Storm Water Pollution Prevention Plan ("SWPPP") for the Playa Vista Project.[7]) The construction-phase BMPs work in a "treatment train" approach such that no one BMP is overly relied upon to control pollutants, better protecting downstream receiving waters and emerging habitats associated with the long-term water quality features at the site.

Playa Capital has implemented its SWPPP without reliance upon the chemical coagulant treatment discussed in the Panel Report. Because of the sensitive nature of the receiving waters and permanent water quality features in the area, it might not be prudent to have chemical "active" treatment at the Playa Vista construction site, the chemical additives of which could, if accidentally released, have adverse impacts to downstream constructed and natural wetlands.

There are many construction sites that appropriately manage construction site runoff through appropriate implementation of BMPs. When construction sites are not properly implementing such BMPs, Regional Water Boards and local municipalities actively pursue

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areas and ensures maintenance of the natural treatment systems in perpetuity through permits issued by various resource agencies.

[7] Playa Vista Company, LLC, *Consolidated Storm Water Pollution Prevention Plan (SWPPP) Playa Vista Project* (2000) (as amended 2005). *See* enclosed §§ 3 (discussing potential pollutant sources) and 4 (discussing BMPs selected to address the identified pollutants).

enforcement actions against these sites.[8] As would be expected through the evolution of any regulatory program, we would expect the Construction General Permit to be adjusted reflecting current best practices. However, quantitative benchmarks or limits are not necessary to effect water quality improvement under the existing BMP-based approach.

B. Fact Finding Should Be Undertaken and Reservations Raised in the Panel Report Should Be Fully Assessed Prior to Considering Adoption of Any Panel Report Recommendations.

It is apparent from the Storm Water Panel Report that fact finding processes were not undertaken by the Panelists. There are numerous instances where the Panel Report acknowledges knowledge gaps and additional analytical needs.[9] In addition, the Panel Report contains several unresolved reservations. For example, with regard to the Panel Report's recommendations on specific construction storm water treatment vehicles, numeric effluent limits and action levels, the Report contains reservations regarding the roles of natural background sediment levels, the potential toxicity of chemicals utilized in active storm water treatment devices, the effect of local soil and site conditions on the use of active treatment systems, and the lack of adequate data on "whole site" best management practices efficiency. Other relevant concerns not mentioned in the Panel Report also merit analysis by the SWRCB. Any determination as to what (if any) the suitable action level or numeric limit for construction site runoff would be is a completely separate issue to be determined after the practicality of any specific treatment control(s) is understood fully. Necessary fact finding exercises must be conducted and reservations must be assessed and resolved before any form of rulemaking, policy making or adjudicatory process involving new or revised storm water permits.

We request that the SWRCB:

- *Examine new development and redevelopment projects that are resulting in substantial pollutant removal both during and after build-out.*

- *Proceed in implementing the existing, progressive storm water programs in California, re-examining and re-adjusting those programs as necessary.*

- *Acknowledge as it considers the Storm Water Panel Report: 1) that in light of this and other evidence, BMP-based programs in the current storm water permits can be effective in protecting water quality, 2) that the storm water regulatory programs fundamentally are sound, 3) that statements in the Panel Report are best used to adjust, but not overhaul, the storm water permit programs, and 4) that statements*

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[8] From 1999, when the current statewide construction permit was initially issued, to the present, the SWRCB along with the nine Regional Water Quality Control Boards have undertaken more than 4000 enforcement actions related to the permit.

[9] Examples include the incomplete information regarding natural sediment levels (p. 16), the unknown toxicity effects of active treatment systems at construction sites (p. 17), and the need to examine the practicality of assigning numeric limits to construction storm water flows (p. 15).

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made by some speakers at the workshops advocating the need to replace BMP-based approaches with numeric limits are not supported by the Panel Report.

- *Conduct the necessary fact finding processes and fully examine all of the reservations listed in the Panel Report as well as other potential reservations prior to considering adoption of any recommendations of the Panel Report through rulemaking, policy statements or permit issuance.*

We appreciate the SWRCB's consideration of these comments, and we look forward to continuing our productive relationship. Should you desire any additional information or clarification regarding these comments, please do not hesitate to contact me.

Regards,

Gene Lucero / SWB

Gene Lucero, Esq.
of LATHAM & WATKINS LLP

Enclosures

cc: Mr. Greg Gearheart, SWRCB
Mr. Bruce Fujimoto, SWRCB
Patti Sinclair, Esq., Playa Capital
Mr. David Nelson, Playa Capital

IV. ENVIRONMENTAL IMPACT ANALYSIS
C. WATER RESOURCES
(2) WATER QUALITY

1.0 INTRODUCTION

This section addresses the potential impacts of the Proposed Project with regard to surface water and groundwater quality during both construction and long-term operation phases of the Project. The surface water quality analysis identifies the main waterbodies that directly or indirectly receive surface water runoff from the Proposed Project site: which include Santa Monica Bay, Ballona Channel, Ballona Wetlands, and the Freshwater Wetlands System. Also addressed are the nature and location of existing potential sources of surface water pollution in or near the Proposed Project. The groundwater quality analysis identifies the potential impacts to groundwater due to contamination from past aerospace and manufacturing uses within the Proposed Project site. The analysis addresses the impacts that would occur for the Project as Proposed, for the Project's Equivalency Program, and for the Project's secondary impacts that would occur from the implementation of the Project's off-site mitigation measures.

This section summarizes information derived from the *Water Resources Technical Report for the Village at Playa Vista Project, Volumes I-III*, August 2003 by Camp Dresser & McKee, Inc. (CDM); Psomas; and GeoSyntec Consultants. The subject technical report is included as Appendices F-1 to the Draft EIR.

2.0 ENVIRONMENTAL SETTING

2.1 Regulatory Framework

2.1.1 Surface Water Quality

The Proposed Project is subject to regulation of surface water quality by the United States Environmental Protection Agency (EPA), the California State Water Resources Control Board (SWRCB), the California Regional Water Quality Control Board – Los Angeles Region (RWQCB), and the County and City of Los Angeles. These regulations include both requirements for direct and indirect permits that regulate surface water discharges as well as other water quality program requirements and plans.

2.1.1.1 Federal Regulations

Clean Water Act

The EPA regulates water quality under the Clean Water Act (CWA). CWA requires that the discharge of pollutants to waters of the United States from any point source be effectively prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The City and County of Los Angeles are currently regulated under the Phase I municipal stormwater NPDES program, under a permit issued and implemented through the RWQCB (MS4 Permit). The Proposed Project is subject to certain requirements of the Los Angeles County municipal stormwater NPDES program, that governs discharges from the municipal separate storm sewer system (MS4) in the Los Angeles region. This MS4 Permit requires controls to reduce discharge of pollutants pursuant to Receiving Water Limitations, the "maximum extent practicable" standard, and such other provisions as the issuing agency (RWQCB) deems appropriate. The requirements applicable to the Proposed Project arising from the MS4 Permit are discussed in Subsection 2.1.1.3.

In California, the SWRCB has issued a general NPDES permit for stormwater discharges associated with construction activities (General Construction Permit), with the permit implemented through the RWQCB. Because the Proposed Project disturbs an area of more than one acre, it requires a NPDES permit for construction activities. The requirements for this General Construction Permit are discussed below in Subsection 2.1.1.2.

Section 303(d) of the CWA requires identification and listing of water-quality limited or "impaired" waterbodies where water quality standards and/or receiving water beneficial uses are not met. Once a waterbody is listed as "impaired," total maximum daily loads (TMDLs) must be established for the pollutants or flows causing the impairment (33 U.S.C. §1313(d)(c)). Both the SWRCB and the EPA have approved a Trash TMDL for the Ballona Creek Watershed, where the Proposed Project is located. Ballona Creek is listed as being impaired for other pollutants (see Subsection 2.1.1.2), but TMDLs have not yet been established for these pollutants.

It is anticipated that implementation of, and compliance with, the Trash TMDL requirements will be administered through the MS4 Permit programs, as well as individual NPDES permits and general industrial stormwater permits (including construction site permits administered by the RWQCB). The TMDL is discussed in more detail in Subsection 2.1.1.2, State Level – California Identified Impaired Waterbodies.

Nutrient Guidelines

The EPA has established nutrient water quality guidelines for various waterbodies based on ambient water quality conditions within defined ecoregions. The Proposed Project is located within Ecoregion 6 of Aggregate Ecoregion III, which is most prominently distinguished by its Mediterranean climate and associated vegetation. The guidelines are not enforceable laws or regulations; they are federal guidelines for establishing state water quality criteria for nutrients. These criteria will be referenced later in this document to assess potential impacts of nutrients on receiving waters.

Federal Antidegradation Policy

The Federal Antidegradation Policy (40 CFR §131.12) requires states to develop statewide antidegradation policies and identify methods for implementing them. Pursuant to the CFR, state antidegradation policies and implementation methods shall, at a minimum, protect and maintain: (1) existing in-stream water uses; (2) existing water quality where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the State finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource.

2.1.1.2 State Level

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (herein referred to as the California Water Code, CWC) established the principal California program for water quality control. The CWC authorizes the SWRCB to implement the provisions of the federal CWA. Under the CWC, the State of California is divided into nine regional boards that, under the guidance and review of the SWRCB, implement and enforce provisions of the CWC and the CWA. The Proposed Project is located in Region 4 (Los Angeles), hereafter referred to as the RWQCB.

Section 13050 of the CWC defines what is considered pollution, contamination, or nuisance. Briefly defined, pollution means an alteration of the water quality such that it unreasonably affects the water's beneficial uses; contamination means an impairment of the water quality to the degree that it creates a hazard to the public health; and nuisance means anything that is injurious to health, is offensive to the senses, or is an obstruction to property use, and which affects a considerable number of people.

Basin Plan

The RWQCB maintains a Water Quality Control Plan, called a "Basin Plan," that specifies beneficial uses, water quality objectives and various water quality control policies and practices for the Los Angeles region. The Basin Plan designates specific beneficial uses, such as water recreation and habitat for the Ballona Creek Estuary[134] and Ballona Wetlands, into which the Proposed Project and the adjacent Playa Vista First Phase Project drain.

In addition to identifying beneficial uses for waterbodies, the Basin Plan includes numerical (quantitative) and narrative (qualitative) water quality objectives applicable to inland surface waters and enclosed bays and estuaries (including wetlands) in the Los Angeles Region, such as the Ballona Creek Estuary and Ballona Wetlands (see Volume 1, Section 3 of the Water Resources Technical Report, Appendix F-1, for a listing of the constituents and parameters). Also included in the plan are narrative objectives that specifically apply to wetlands, such as the Ballona Wetlands, and limit modifications to hydrology and habitat in order to minimize impacts to wetlands flora and fauna.

California Ocean Plan

The Basin Plan also incorporates SWRCB statewide Water Quality Control Plans such as the California Ocean Plan (COP), which is implemented by the SWRCB and the RWQCB. The COP establishes water quality objectives for California's ocean waters and provides a basis for regulation of wastes discharged to coastal waters by point and non-point source discharges. The COP describes beneficial uses and water quality objectives for the open ocean waters – not forebays and estuaries such as those found adjacent to and directly downstream of the adjacent Playa Vista First Phase Project and the Proposed Project. Although the COP does not apply to the receiving waters immediately downstream of the adjacent Playa Vista First Phase Project and the Proposed Project, the COP's numerical objectives have been used for comparative purposes to assess some of the potential impacts of water quality constituents without regulatory limits.

California Toxic Rule

The EPA has established water quality criteria for certain toxic substances via the California Toxic Rule (CTR). The CTR establishes acute and chronic surface water quality standards for waterbodies such as inland surface waters and enclosed bays and estuaries that are designated by the RWQCB as having beneficial uses protective of aquatic life or human health. Surface water runoff from the Proposed Project site discharges to waters to which the CTR applies, including Santa Monica Bay, Ballona Channel, and the Ballona Wetlands. The CTR are used herein to evaluate potential impacts to these waters and for comparative purposes to assess water quality in the Freshwater Wetlands System.

[134] *Unless stated differently, references to the "Ballona Channel" shall mean the Ballona Creek Estuary portion of the channel which receives flows directly from the Freshwater Marsh.*

NPDES Statewide General Construction Stormwater Permit

The SWRCB issues the statewide NPDES general permit for stormwater discharges associated with construction activities (General Construction Permit). This permit requires monitoring for sediment and non-visible pollutants under specified circumstances. A development project, such as the Proposed Project, that disturbs an area greater than one acre requires a Notice of Intent to discharge under the General Construction Permit. The General Construction Permit includes measures to eliminate or reduce pollutant discharges through a Stormwater Pollution Prevention Plan (SWPPP), which describes the implementation and maintenance of best management practices (BMPs) to control stormwater and other runoff during and after construction. The General Construction Permit contains receiving water limitations, which state that stormwater discharges shall not cause or contribute to a violation of any applicable water quality standard. It is anticipated that the Proposed Project will be covered under the statewide NPDES General Construction Permit.

California Identified Impaired Waterbodies

Under Section 303(d) of the CWA, the State of California identifies Ballona Creek, Ballona Creek Estuary, the Ballona Wetlands, and the Santa Monica Bay as water-quality limited. Water-quality limited or "impaired" waterbodies are those waterbodies that are not, or are not expected to be, in compliance with applicable water quality standards despite the implementation of technology-based effluent limits. They are identified through water quality assessments conducted by the RWQCB. The "Ballona Creek Estuary" extends from the mouth of Ballona Creek to Centinela Avenue. The "Ballona Creek to Ballona Creek Estuary" reach extends from Rodeo Road at Jefferson Boulevard to Centinela Avenue. The outlets that drain from the Freshwater Marsh and the Ballona Wetlands into the Ballona Channel are located within the Ballona Creek Estuary; therefore, their discharges do not affect the upstream portions of the Ballona Channel. In February 2003, SWRCB approved the expansion of the listing to include 315 acres.[135] This listing has been submitted to the EPA for review and approval. In order to provide a conservative analysis of the water quality of the runoff from the Proposed Project site for the purposes of this EIR, it has been assumed that the runoff from the Proposed Project would flow through the Freshwater Wetlands System to the area of the Ballona Wetlands that is the focus of the 303(d) listing. This approach is conservative because the Freshwater Marsh is designed to discharge to the Ballona Wetlands only during storms greater than a one-year design storm. Santa Monica Bay and the Ballona Creek to Ballona Creek Estuary reach would not receive any runoff directly from the Proposed Project. As such, the EIR analysis focuses primarily on the Ballona Creek Estuary and Ballona Wetlands as 303(d)-listed waterbodies that may receive runoff from the Proposed Project.

[135] *State Water Resources Control Board, Res. 2003-0009, Approval of the 2002 Federal Clean Water Act Section 303(d) List of Water Quality Limited Segments. [Online] http://www.swrcb.ca.gov/tmdl/docs.*

Table 31 on page 406 provides the current list, as of February 2003, of parameters identified by the State as causing impairments of beneficial uses for Ballona Creek Estuary, Ballona Wetlands, and Santa Monica Bay. As a result of the 2002 Section 305(b) water quality assessment, the 303(d) list has been revised. The 2002 303(d) list was approved by the SWRCB on February 4, 2003, and was submitted to the EPA for approval on February 28, 2003.[136] EPA's proposed revisions of the February 4 list were provided to the SWRCB by letter from EPA dated June 5, 2003.[137] None of these proposed revisions related to the subject waterbodies.[138]

Under Section 303(d), TMDLs for impaired waterbodies must be established for the pollutants causing the impairment (33 U.S.C. §1313(d)(c)). To date, the SWRCB and the EPA have approved the Trash TMDL for the Ballona Creek Watershed, in which the Proposed Project is located.[139] A "pollution budget" or pollutant load allocation must be established for point and non-point sources that contribute to the water quality impairment. Once a pollution budget has been set, which for the Ballona Creek Watershed is zero trash discharged by the twelfth year following implementation of approval of the TMDL, load allocations for point sources are implemented through NPDES permits for individual dischargers. It is anticipated that implementation of, and compliance with, the TMDL requirements will be administered through the County's and City's MS4 Permit program.

Eventually all of the 303(d)-listed waterbodies and pollutants will have TMDLs established. The Santa Monica Bay beaches have draft Dry-weather and Wet-weather TMDLs for indicator bacteria that are currently being reviewed by the SWRCB.[140] A coliform TMDL for

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[136] *State Water Resources Control Board, 2003. Letter to Catherine Kuhlman of the USEPA Region 9 Water Division: Transmittal of the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments. February 28, 2003 [Online] http://www.swrcb.ca.gov/tmdl/docs/ usepa2002list_trasmittal.pdf*

[137] *State Water Resources Control Board, 2003. Consideration of a Resolution to Approve the 2002 Federal Clean Water Act Section 303(d) list of Water Quality Limited Segments, February 4, 2003.*

[138] *EPA, 2003. Federal Register 68 FR 33693, Clean Water Act Section 303(d): Availability of List Decision, June 5, 2003.*

[139] *The Trash TMDL for the Ballona Creek Watershed is currently under legal challenge by both the City and County of Los Angeles. Two lawsuits were filed in the Los Angeles County Superior Court in 2002, one on behalf of the City of Los Angeles, Bureau of Sanitation (Case No. BC 270452 – filed March 21, 2002), and one on behalf of the County of Los Angeles and the Los Angeles County Flood Control District (Case No. BC 279597 – filed August 13, 2002). Both lawsuits have been transferred out of Los Angeles County Superior Court. The City of Los Angeles, Bureau of Sanitation lawsuit has been transferred to Ventura County Superior Court and the County of Los Angeles and the Los Angeles County Flood Control District lawsuit is now in San Diego County Superior Court.*

[140] *Los Angeles Regional Water Quality Control Board, 2002. Amendment to the Water Quality Control Plan (Basin Plan) for the Los Angeles Region to Incorporate Implementation Provisions for the Region's Bacteria Objectives and to Incorporate a Wet-Weather Total Maximum Daily Load for Bacteria at Santa Monica Bay Beaches. Resolution No. 2002-022, December 12, 2002. [Online] http://www.swrcb.ca.gov/rwqcb4/html/ meetings/tmdl/tmdl_ws_santa monica.html*

Table 31

LISTED WATER QUALITY PARAMETERS FOR BALLONA CREEK ESTUARY, BALLONA WETLAND, AND SANTA MONICA BAY

Parameter	Ballona Creek Estuary	Ballona Wetland	Santa Monica Bay [a]
Arochlor (PCB product trade name)	✓ [b]		
Arsenic, tissue		✓ [b]	
Cadmium, sediment			✓ [b]
Chlordane, tissue (pesticide)	✓		
Chlordane, sediment (pesticide)	✓		✓
Copper, sediment			✓ [b]
DDT, tissue (pesticide)			✓
DDT, sediment (pesticide)	✓		✓
Debris			✓
Exotic Vegetation		✓	
Fish Consumption Advisory			✓
Habitat Alterations		✓	
High Coliform Count	✓		
Hydromodification		✓	
Lead, tissue			✓ [b]
Lead, sediment	✓		✓ [b]
Mercury, sediment			✓ [b]
Nickel, sediment			✓ [b]
PAHs, sediment (polycyclic aromatic hydrocarbons)	✓		✓
PCBs, sediment and tissue (polychlorinated biphenyls)	✓		✓
Reduced Tidal Flushing		✓	
Sediment Toxicity	✓		✓
Shellfish Harvesting Advisory	✓		
Silver, tissue			✓ [b]
Trash		✓	
Zinc, sediment	✓		✓ [b]

[a] *Listing for Santa Monica Bay offshore and near shore.*
[b] *Proposed to be delisted in the 2002 303(d).*

Source: Parameters included in 1998 and Proposed 2002 California 303(d) List. The 2002 list has been submitted to EPA for review and approval.

the Ballona Creek Estuary, which may also apply to dry-weather flows, is planned for completion during the 2003/2004 fiscal year. By 2005, all of the 303(d)-listed parameters for the Ballona Creek Estuary should have TMDLs established. By 2010, all Ballona Wetlands TMDLs should be completed.[141]

[141] *Los Angeles Regional Water Quality Control Board, 2002. Table 7A. Summary Schedule for TMDL Development. [Online] http://www.swrcb.ca.gov/rwqcb4/docs/table7_wmi_appdx.pdf*

California Non-Point Source Pollution Control Program

SWRCB and the California Coastal Commission (CCC) developed California's Non-Point Source Pollution Control Program, which contains management measures for categories of land use/development. The categories potentially relevant to the Proposed Project are: Urban Areas, Hydromodification, and Wetlands/Riparian Areas/Vegetated Treatment Systems.[142]

Under the Non-Point Source Program Strategy and Implementation Plan 1998-2013 (NPS Plan), a 3-tier system of BMPs is used as a means of implementing non-point source water quality management measures and strategies. Relevant to the Proposed Project, the NPS Plan contains two Management Measures to address non-point source pollution, 6B (Restoration of Wetlands/Riparian Areas) and 6C (Vegetated Treatment Systems), which place an emphasis on the use of natural treatment systems, including marshes and wetlands.

State's Antidegradation Policy

In accordance with the Federal Antidegradation Policy discussed in Subsection 2.1.1.1 on page 401, the SWRCB adopted Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (more commonly referred to as the State's Antidegradation Policy), which restricts the degradation of surface waters of the State and protects waterbodies where the existing water quality is higher than necessary for the protection of present and anticipated designated beneficial uses. The State Antidegradation Policy is implemented by the RWQCB.

2.1.1.3 Local Level

Los Angeles County Municipal Stormwater NPDES Program

The County of Los Angeles and the City of Los Angeles are co-permittees under the municipal stormwater NPDES permit for Los Angeles County (MS4 Permit described above under Subsection 2.1.1.1). The Proposed Project is within the region covered by the MS4 Permit (NPDES Permit No. CAS004001, issued by the RWQCB on December 13, 2001).[143] Under the MS4 Permit, the County and City are required to implement development planning guidance and control measures that control and mitigate the stormwater quality and quantity impacts to receiving waters as a result of new development and redevelopment. They also are required to

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[142] *California Coastal Commission. http://ceres.ca.gov/coastalcomm/nps/npsndx.html*

[143] *NPDES Permit No. CAS004001 is currently under litigation (Los Angeles County Development Corporation Economic v California State Water Resources, Case No. BS080792.). However, the permit remains in effect and has not been stayed or in any way rendered ineffective by the current legal action.*

implement other municipal source detection and elimination programs as well as maintenance measures.

The MS4 Permit contains provisions for implementation and enforcement of the Stormwater Quality Management Program (SQMP). The objective of the SQMP is to reduce pollutants in urban stormwater discharges to the "maximum extent practicable," in order to attain water quality objectives and protect the beneficial uses of receiving waters in Los Angeles County. Special provisions are provided in the MS4 Permit to facilitate implementation of the SQMP. In addition, the MS4 Permit requires the permittees to implement a Standard Urban Stormwater Mitigation Plan (SUSMP) that designates best management practices (BMPs) that must be used in specified categories of development projects.[144]

One of the most important requirements within the SUSMP is the specific design sizing criteria for stormwater treatment/management for new development and redevelopment projects. The SUSMP requires developers to mitigate (infiltrate or treat) the stormwater runoff (volume or flow rate) generated from 0.75 inches of rainfall over 24 hours (determined to represent the 85th percentile of storms in Los Angeles County). The SUSMP also requires that all stormwater treatment/management facilities be designed to "control the peak flow discharge to provide stream channel and over bank flood protection" based on the requirements of the City of Los Angeles' storm drain design criteria. These criteria require that any storm drain in a natural drainage course be designed to control the 50-year storm event.[145] In addition to the sizing requirements, the SUSMP includes eight general requirements as follows:

1. maintain pre-development peak stormwater runoff discharge rates where increases will result in increased potential for downstream erosion,

2. conserve natural areas,

3. minimize stormwater pollutants of concern,

4. protect slopes and channels,

5. provide storm drain system stenciling and signage,

6. properly design outdoor material storage areas,

7. properly design trash storage areas, and

[144] *Los Angeles County, 2000. Standard Urban Stormwater Mitigation Plan for Los Angeles County and Cities in Los Angeles County. Approved by Regional Board Executive Officer, March 8, 2000.*

[145] *City of Los Angeles, Department of Public Works, Bureau of Engineering, 1986. Storm Drain Design Manual Part G. [Online] http://eng.lacity.org/techdocs/stormdr/Index.htm*

8. provide proof of ongoing BMP maintenance.

Also, the SUSMP includes general design specifications for individual priority project categories, such as 100,000-square-foot commercial developments, restaurants, and parking lots. For example, commercial developments must have properly designed loading and unloading dock areas, repair and maintenance bays, and vehicle equipment wash areas. Restaurants need to have properly designed equipment and accessory wash areas. Parking lots have to be properly designed to limit oil contamination and have regular maintenance of parking lot stormwater treatment systems (e.g., storm drain filters and biofilters).

Project Design Features are compared to sizing requirements in the paragraphs below, followed by brief discussions of the Proposed Project with respect to selected general SUSMP requirements. All other general SUSMP requirements are addressed in the waterbody-specific impacts subsections. A detailed discussion of how all of the SUSMP requirements would be met by the Proposed Project is provided in Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1).

2.1.1.4 Freshwater Wetlands System Performance Criteria

The initial proposal for the Freshwater Wetlands System emerged from the Applicant's predecessor's efforts in the late 1980s and early 1990s to bring about the settlement of a litigation challenging the California Coastal Commission's 1984 certification of a Coastal Land Use Plan for the coastal zone portions of Playa Vista (the "Settlement Agreement").[146] The Settlement Agreement required the creation of the Freshwater Wetlands System. In order to construct the Freshwater Wetlands System, the landowners of the adjacent Playa Vista First Phase Project and the Proposed Project were obligated to obtain a permit under Section 404 of the CWA (404 Permit)[147] in order to dredge and fill certain waters within the project site considered jurisdictional by the U.S. Army Corps of Engineers (USACE). In order to obtain the 404 Permit, the USACE required certifications be obtained from the SWRCB (with input from the RWQCB) regarding compliance with Section 401 of the CWA (401 Certification),[148] and the California Coastal Commission (CCC) regarding compliance with the Coastal Zone Management Act's requirements for managing non-point source pollution and the California Coastal Act's

[146] *Friends of Ballona Wetlands v. the California Coastal Commission, Los Angeles County Superior Court, Case No. C525 826.*

[147] *U.S. Army Corps of Engineers (USACE), Clean Water Act Section 404 Permit No. 90-326-EV, March 14, 1996.*

[148] *State Water Resources Control Board (SWRCB), Conditional Water Quality Certification Under Clean Water Act Section 401 (July 3, 1995) (incorporating Memorandum from Regional Water Quality Control Board (RWQCB) to SWRCB (June 15, 1995) and Memorandum from RWQCB to SWRCB, November 30, 1993.*

water quality policies (CCC Certification).[149] The 401 Certification and CCC Certification were obtained, and a 404 Permit was issued governing both the adjacent Playa Vista First Phase Project and the Proposed Project. Also, the landowner obtained a Coastal Development Permit (CDP) for the construction of the Freshwater Marsh [150] from the CCC that, among its requirements, contained provisions related to water quality monitoring of the Freshwater Wetlands System to assure the water quality within the system would be maintained at levels suitable for the proposed habitat uses. As a requirement of the 404 Permit, the landowner prepared and submitted to the USACE the Habitat Mitigation and Monitoring Plan (HMMP)[151] that described and elaborates on requirements in the 404 Permit relevant primarily to habitat goals and water-related issues necessary to establishing and maintaining the habitat.

The 404 Permit recognizes the Freshwater Wetlands System as having multiple purposes and states that those purposes are: (1) to improve the quality of urban runoff entering the Ballona Wetlands and Santa Monica Bay, reducing existing water quality impacts to the area and aiding in the national program for improvement of water quality from urban runoff; (2) provide ecologically-sound flood control facilities for the Playa Vista First Phase Project, the Proposed Project, and surrounding roads and communities; and (3) provide wildlife habitat enhancement in an area where severe habitat degradation had occurred.[152] The 404 Permit, the 401 Certification, the CCC Certification, the CDP, and the HMMP established performance criteria that are designed to take into account the specific conditions of the adjacent Playa Vista First Phase Project and the Proposed Project and allow the Freshwater Wetlands System to function in its water quality, flood control, and habitat enhancement capacities (Performance Criteria).[153] These Performance Criteria are conditions and requirements of the 404 Permit, the 401 Certification, and the CCC Certification and, as such, are "regulatory standards" as that term is used in the Draft Los Angeles CEQA Thresholds Guide.

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[149] *California Coastal Commission, Consistency Certification for wetland fill activities as described in the application for Corps of Engineers Permit pursuant to Section 404 of the Clean Water Act, Application No. 90-426-EV, Ballona Wetlands, Los Angeles County, CC-66-91, October 25, 1991.*

[150] *California Coastal Commission, Coastal Development Permit for Maguire Thomas Partners – Playa Vista, Permit No. 5-91-463, August 7, 1992.*

[151] *Playa Capital Co., Habitat Mitigation and Monitoring Plan, November 1995.*

[152] *Los Angeles District Corps of Engineers, Environmental Assessment 404(b)(1) Evaluation Public Interest Review, Permit Application Number: 90-426-EV, at 5-6, July 1, 1992 (prepared in conjunction with the 404 Permit).*

[153] *As an example of the performance criteria: (1) regarding habitat, the 404 Permit requires establishment within the Freshwater Marsh, of 9.7 acres of open water, 7.2 acres of marsh habitat, 5.5 acres of willow woodlands, and 3.7 acres of mixed riparian habitat; (2) regarding flood control, the 404 Permit states that at buildout, the Freshwater Wetlands System will contain a 1-year frequency storm event (based on city of L.A. Peak Rate Hydrology Method); and (3) regarding water quality, the 401 Certification requires the Storm Water Pollution Prevention Plan prepared during construction of the project include procedures to reduce gully and rill erosion.*

2.1.2 Groundwater Quality

The Proposed Project is subject to groundwater quality regulations at the federal, state, and local level by the EPA, California EPA (CalEPA), and RWQCB. Furthermore, the RWQCB, acting as the lead regulatory agency for the state, may solicit input from other state and local agencies as appropriate.

2.1.2.1 Federal Level

Under the Safe Drinking Water Act, the EPA sets drinking water standards referred to as the National Primary Drinking Water Regulations, 40 CFR Part 141, and the National Secondary Drinking Water Regulations, 40 CFR Part 143. These regulations set maximum contamination levels (MCLs)[154] for substances in drinking water and apply to groundwater if the groundwater is a source of potable water or otherwise subject to the MUN-designated use.[155] Groundwater in the area of the adjacent Playa Vista First Phase Project and the Proposed Project is not currently pumped for beneficial uses (i.e., drinking water, industrial or agricultural supply).[156] A comparison of groundwater concentrations to MCL standards is provided in Section IV.I, Safety/Risk of Upset.

2.1.2.2 State Level

RWQCB was appointed lead agency by CalEPA to regulate activities and factors that affect or may affect groundwater quality at the Proposed Project site. As discussed in Subsection 2.1.1.2, the Basin Plan specifies beneficial uses for the Santa Monica Basin, where the Proposed Project is located. A determination of whether the subject groundwater concentrations exceed any applicable regulatory standards or otherwise require remediation actions will be made by the RWQCB in conjunction with the ongoing implementation of the Cleanup and Abatement Order (CAO) No. 98-125, as discussed in detail in Section IV.I, Safety/Risk of Upset.

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[154] *Maximum Contamination Levels (MCLs) are referenced as a basis for comparisons. However cleanup levels for on-site contamination would be determined by the RWQCB in accordance with the requirements of the Cleanup and Abatement Order No. 98-125.*

[155] *"MUN" is defined in the Basin Plan as "Municipal and Domestic Supply (MUN) uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply." Los Angeles Basin Plan, page 2-1.*

[156] *The closest public supply wells are located approximately 3.5 miles northwest of the Proposed Project in the City of Santa Monica. The nearest irrigation well is located approximately 2 miles southeast of the Proposed Project at the Hillside Memorial Park Cemetery. There is an abandoned public water supply well located at Venice Polytechnic High School, approximately 2 miles northwest of the Proposed Project that was capped in 1960.*

In addition, Title 22, Division 4, Chapter 15 of the California Code of Regulations establishes primary and secondary drinking water standards for public water systems based on national standards. Groundwater in the area of the Proposed Project is not currently used for drinking water. See Section IV.I, Safety/Risk of Upset for further discussion.

2.1.2.3 Local Level

The RWQCB enforces the General Construction Permit to control pollutant discharges through a SWPPP. While the BMPs included in the SWPPP primarily are aimed at minimizing the discharge of pollutants to receiving surface waters, the BMPs also would serve to minimize any short-term impacts on groundwater quality from construction activities.

2.2 Existing Conditions

The following subsections describe the existing water quality characteristics of waterbodies most relevant to the Proposed Project. The descriptions include comparisons of available water quality sampling data to certain water quality criteria and objectives, as described above in Subsection 2.1. Such comparisons have been provided to indicate the types of pollutants of concern in the receiving waterbodies.

2.2.1 Surface Water Quality

This subsection discusses the surface water quality in the vicinity of the Proposed Project site, including the existing conditions of the Santa Monica Bay, the Ballona Channel, the Ballona Wetlands, and the Freshwater Wetlands System. The Freshwater Wetlands System, which is currently under construction pursuant to the adjacent Playa Vista First Phase Project approvals, provides water quality enhancement for the off-site areas and the built-out areas of the adjacent Playa Vista First Phase Project and the Proposed Project. Continuous point source loadings are also discussed.

2.2.1.1 Santa Monica Bay

Santa Monica Bay generally receives surface water drainage from storm drains, overland flow, treated process waters from industrial sites, industrial and commercial discharges of non-process wastewater,[157] and discharges from power plant and wastewater treatment plant outfalls,

[157] *Santa Monica Bay Restoration Commission. http://www.santamonicabay.org/site/problems/layout/water.jsp.*

all of which contribute to pollutant loading in the Bay. Pollutants are transported into the Bay through flushing of adjacent marina and estuary areas by daily tidal fluctuations. The Bay receives urban runoff indirectly from the adjacent Playa Vista First Phase Project and the Proposed Project sites via the Freshwater Marsh, which flows directly to the Ballona Channel. In addition, some runoff from larger storms (i.e., larger than a 1-year design storm) would overflow from the Freshwater Marsh (by design) and flows through the Ballona Wetlands prior to discharge to the Ballona Channel. A recent study conducted in 2001 by the Santa Monica Bay Restoration Project, University of California Los Angeles (UCLA), and Southern California Water Resources Program also noted that aerial deposition to the Bay was a potential source of mass loading for zinc, copper, and lead.[158]

Based on the SWRCB's 1994 Water Body Fact Sheet and the RWQCB, the waters of Santa Monica Bay have been assigned a Class C (impaired) rating. A Class C rating for Santa Monica Bay means that the water in the Bay is suitable for fish and aquatic habitat as well as secondary contact recreation (water related activity, such as boating, marine life study, beachcombing, sunbathing, and fishing). The Santa Monica Bay's biological community has been identified as being imbalanced, severely stressed, or known to contain toxic substances in concentrations that are hazardous to human health.[159] The contaminants of greatest concern in the Bay are chlorinated and polyaromatic hydrocarbons, organometalloids, viral pathogens, and trace metals (copper and zinc). Certain of these contaminants tend to bioaccumulate and/or are not degraded by natural biological processes; therefore, they can present risks to biota and human health at elevated concentrations. The Bay is generally considered to be nutrient poor.

The water and sediment in Santa Monica Bay has been monitored extensively by state and federal resource management agencies (such as RWQCB and SWRCB), by local agencies, by citizen volunteer monitoring groups sponsored by local environmental organizations (such as Heal the Bay and Santa Monica BayKeeper), as well as by consulting firms as part of environmental studies of adjacent water resources. Summaries of the sampling data from some of these environmental studies are provided in Volume I, Section 3 of the Water Resources Technical Report (see Appendix F-1).

In 1993, the Santa Monica Bay Restoration Project published an assessment of the storm drain sources of contaminants to Santa Monica Bay by UCLA Department of Civil and Environmental Engineering and Woodward-Clyde Consultants.[160] The study and following

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[158] *Stolzenback, Keith D., et al. Measuring and Modeling of Atmospheric Deposition on Santa Monica Bay and the Santa Monica Bay Watershed, September 2001.*

[159] *State Water Resources Control Board, Water Body Fact Sheet, May 18, 1994.*

[160] *Stenstrom and Strecker, UCLA Department of Civil and Environmental Engineering, and Woodward-Clyde Consultants, Assessment of the Storm Drain Sources of Contamination to Santa Monica Bay, 1993.*

update,[161] summarized in four volumes, concluded that significant pollution enters the Bay from urban runoff originating from existing residential, industrial, and commercial land use areas surrounding Santa Monica Bay.

Coliform bacteria (a human pathogen indicator) water quality objectives have exceeded state standards in Santa Monica Bay under existing conditions.[162] The State of California uses this type of data to assess water quality impairment and develop subsequent regulatory efforts (listing of water quality-limited waterbodies, i.e., 303(d) listings), as well as to investigate known sources. The exceedance of these water quality objectives indicates an increased risk that human pathogens are present, but does not confirm the presence of specific human pathogens. There are many sources of coliform bacteria.

Using qualitative and/or quantitative assessment techniques as appropriate, existing water quality of the Santa Monica Bay, which does not receive direct runoff from the Proposed Project, was assessed in terms of the potential for the Proposed Project to exacerbate existing potential water quality problems, and in terms of the Project Design Features included to control potential sources.

As mentioned in Subsection 2.1, the RWQCB has prepared a Dry-Weather Total Maximum Daily Load for Bacteria at Santa Monica Bay Beaches, which is currently being reviewed by EPA and SWRCB.[163] A source analysis of the elevated densities of bacterial indicators showed that at many of the Santa Monica Bay beaches dry-weather urban runoff conveyed by storm drains and creeks (which includes Ballona Creek and Estuary) are the cause of water quality impairment in terms of the water contact recreation (REC-1) beneficial use.

A compound of concern in sediments in the area is tributyltin (TBT). TBT has been introduced into the Bay from antifouling agents applied to boats. Although its use has been banned for several years, TBT levels in Santa Monica Bay have not decreased. No TBT will be generated by the Proposed Project.

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[161] *Wong, K.M., E.W. Strecker, and M.K. Stenstrom, "GIS to Estimate Stormwater Pollutant Mass Loadings," ASCE Journal of Environmental Engineering, Vol.123, No. 8, pp. 737-745, August 1997.*

[162] *Santa Monica Bay Restoration Commission. http://www.santamonicabay.org/site/problems/layout/water.jsp.*

[163] *California Regional Water Quality Control Board, Los Angeles Region, Draft Total Maximum Daily Load to Reduce Bacterial Indicator Densities during Dry Weather at Santa Monica Bay Beaches, 2002. This TMDL was considered effective as of July 15, 2003, when the RWQCB filed its Notice of Decision with the California Resources Agency.*

2.2.1.2 Ballona Channel

The Ballona Channel is located just north of the adjacent Playa Vista First Phase Project and the Proposed Project, and discharges directly into Santa Monica Bay. The Channel serves as the major outlet for a 122-square mile (78,000-acre) watershed upstream of the Ballona Wetlands, which includes the highly urbanized West Central Los Angeles Metropolitan Area, and a portion of the Santa Monica Mountains. The Ballona Channel receives urban runoff from the adjacent Playa Vista First Phase Project and the Proposed Project sites via the Freshwater Marsh and Ballona Wetlands.

The Los Angeles County Department of Public Works (LACDPW) regularly has sampled Ballona Channel upstream of the adjacent Playa Vista First Phase Project and the Proposed Project during both dry-weather and storm flow conditions. In addition to the LACDPW sampling, Ballona Channel also was sampled at discrete periods by Aquatic Bioassay and Consulting Laboratories, Inc. (ABCL); Camp Dresser and McKee Inc. (CDM); Chambers Group; and URS Greiner Woodward Clyde (URSGWC). Due to the saltwater wedge[164] and the varying conditions in the Channel, the evaluation of existing data can be divided into the freshwater and saltwater portions of the Channel. Because the drainage from the adjacent Playa Vista First Phase Project and the Proposed Project discharges downstream of the Channel's intersection with Culver Boulevard, well within the saltwater portion of the Channel which, for the purposes of this document, is within the Ballona Creek Estuary; therefore, only the saltwater portion of the Channel is discussed. This portion of the Channel between the Channel's intersection with Culver Boulevard and a point approximately 3,000 feet east of Lincoln Boulevard (near the confluence with Centinela Creek, the extent to which the Channel is tidally influenced) is known as the saltwater wedge.

Table 32 on page 416 and Table 33 on page 418 summarize selected constituents in the saltwater portions of the Ballona Channel. This selected list of constituents includes water quality constituents in the Ballona Channel that exceeded CTR criteria, constituents that are to be evaluated in the pollutant-loading model described in Subsection 3.1, and constituents listed in

[164] *The saltwater wedge, also referred to as the tidal prism, is the intersection of freshwater and saltwater near where the Ballona Channel empties into Santa Monica Bay. It is created in the channel by the daily tidal fluctuations in the Bay as the saltwater from the Bay advances and retreats in the Channel. The water column of the tidal prism is a mixture primarily of Santa Monica Bay and, to limited extent, Marina del Rey saltwater, with freshwater from upstream flows in the Ballona Channel. Typically, the denser saltwater intruding from the Bay will become overlain by less dense freshwater flowing down Ballona Channel with some mixing and diffusion. (Camp Dresser & McKee Inc. Ballona Creek Salinity Monitoring and Water Quality Sampling Results. August 14, 1996.)*

Table 32

SELECTED* WATER QUALITY CONSTITUENTS IN BALLONA CHANNEL DURING DRY-WEATHER

Constituent	Units	Chronic CTR Criteria [a,b]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations		
					Minimum	Maximum	Mean
Oil and Grease	mg/L	—	15	—	ND	57	8
Total Coliform	MPN/100ml	—	13	—	ND	16,000	3,567
Fecal Coliform	MPN/100ml	—	13	—	ND	1,300	216
Hardness	mg/L	—	6	—	2,600	6,300	4,253
TKN	mg/L	—	10	—	ND	1.8	0.7
Ammonia	mg/L	—	6	—	ND	0.53	0.16
Dissolved Oxygen	mg/L	—	22	—	27	110	59
Total Phosphorus	mg/L	—	16	—	ND	0.53	0.16
Total Suspended Solids	mg/L	—	6	—	27	110	59
Salinity	ppt	—	24	—	21.09	33.5	30
Dissolved Arsenic	µg/L	36	4	0	ND	2	1
Total Arsenic	µg/L	—	14	—	ND	ND	ND
Dissolved Cadmium	µg/L	9.3	4	0	ND	ND	ND
Total Cadmium	µg/L	—	14	—	ND	1.7	0.1
Dissolved Copper	µg/L	3.1	10	5	ND	120	32
Total Copper	µg/L	—	8	4	ND	120	19
Dissolved Lead	µg/L	8.1	10	0	ND	ND	ND
Total Lead	µg/L	—	8	—	ND	55	16
Dissolved Mercury	µg/L	—	10	—	ND	ND	ND
Total Mercury	µg/L	—	8	—	ND	0.35	0.05
Dissolved Nickel	µg/L	8.2	10	0	ND	ND	ND
Total Nickel	µg/L	—	8	—	ND	ND	ND
Dissolved Selenium	µg/L	71	4	2	ND	440	208
Total Selenium	µg/L	—	8	—	ND	460	102
Dissolved Silver	µg/L	—	4	—	ND	1.7	0.4
Total Silver	µg/L	—	8	—	ND	ND	ND
Dissolved Zinc	µg/L	81	10	4	ND	210	97
Total Zinc	µg/L	—	8	—	ND	170	46
PAHs	µg/L	—	2	—	ND	ND	ND
Naphthalene	µg/L	—	6	—	ND	3.1	1
PCB-1016	µg/L	0.03	8	0	ND	ND	ND
PCB-1221	µg/L	0.03	8	0	ND	ND	ND
PCB-1232	µg/L	0.03	8	0	ND	ND	ND
PCB-1242	µg/L	0.03	8	0	ND	ND	ND
PCB-1248	µg/L	0.03	8	0	ND	ND	ND
PCB-1260	µg/L	0.03	8	0	ND	ND	ND
PCB-1254	µg/L	0.03	9	0	ND	ND	ND
Aldrin [b]	µg/L	0.00014	8	0	ND	ND	ND
Chlordane	µg/L	0.004	8	0	ND	ND	ND
Dieldrin [b]	µg/L	0.0019	8	0	ND	ND	ND
Endrin [b]	µg/L	0.0023	8	0	ND	ND	ND
Toxaphene	µg/L	0.0002	8	0	ND	ND	ND
Heptachlor	µg/L	0.0036	8	0	ND	ND	ND
Heptachlor Epoxide [b]	µg/L	0.0036	8	0	ND	ND	ND

Table 32 (Continued)

SELECTED* WATER QUALITY CONSTITUENTS IN BALLONA CHANNEL DURING DRY-WEATHER

Constituent	Units	Chronic CTR Criteria [a,b]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations Minimum	Maximum	Mean
O,P'-DDT	μg/L	—	6	—	ND	ND	ND
P,P'-DDT	μg/L	0.001	8	0	ND	ND	ND

— = No Criteria *CTR = California Toxics Rule* *NA = Not Analyzed*
ND = Not Detected *μg/l = micrograms per liter* *mg/L = milligrams per liter*
ppt = parts per thousand
MPN/100 ml = Most Probable Number per 100 milliliters

* *"Selected" water quality constituents represent those water quality constituents most relevant to the analysis and discussion presented in this section. The data for all constituents sampled is contained in Volume I, Section 3, Water Resources Technical Report (Appendix F-1).*

[a] *For waters in which salinity is equal to or greater than 10 ppt and 95 percent or more of the time, the applicable criteria are the saltwater criteria.*

[b] *CTR criteria are for the protection of human health due to the consumption of aquatic organisms living in waters with carcinogenic compounds.*

Final CTR Criteria = May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California.

Aquatic Bioassay Consulting Laboratory, September 15, 1997. The Marine Environment of Marina del Rey Harbor, July 1996-June 1997.

Camp Dresser & McKee Inc., August 14, 1996. Ballona Creek Water and Sediment Quality Sediment Quality Report, 1995/1996, Wet Weather Season, Playa Vista, California.

Camp Dresser & McKee Inc., October 1998. Playa Vista Area A and Area B Wetlands Surface Water and Sediment Monitoring Report.

Chambers Group, Inc., March 1993. Comparison of the Re-establishment of Tidal Flow in the Ballona Wetlands Through the Ballona Channel or Through the Marina del Rey Entrance Channel.

Woodward-Clyde Consultants, November 1990. Final Technical Appendix to the Master EIR. Table 5-7.

Source: Camp Dresser & McKee Inc.

Table 33

SELECTED* WATER QUALITY CONSTITUENTS IN BALLONA CHANNEL DURING WET-WEATHER

Constituent	Units	Acute CTR Criteria [a]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations Minimum	Maximum	Mean
Oil and Grease	mg/L	—	13	—	ND	16	5.4
Total Coliform	MPN/100ml	—	1	—	ND	ND	ND
Fecal Coliform	MPN/100ml	—	1	—	ND	ND	ND
Hardness	mg/L	—	6	—	54	1800	487
Salinity	ppt	—	2	—	26.5	33.5	30
Total Suspended Solids	mg/L	—	2	—	89	120	105
Total Phosphorus	mg/L	—	13	—	0.18	2.9	1.0
TKN	mg/L	—	8	—	0.18	6.4	2.3
Total Arsenic	μg/L	—	7	—	ND	ND	ND
Dissolved Arsenic	μg/L	69	5	0	ND	ND	ND
Total Cadmium	μg/L	—	7	—	ND	ND	ND
Dissolved Cadmium	μg/L	42	5	0	ND	ND	ND
Total Copper	μg/L	—	7	—	ND	30	10
Dissolved Copper	μg/L	4.8	5	4	ND	13	10
Total Lead	μg/L	—	7	—	ND	ND	ND
Dissolved Lead	μg/L	210	5	0	ND	ND	ND
Total Mercury	μg/L	—	7	—	ND	ND	ND
Dissolved Mercury	μg/L	—	5	—	ND	ND	ND
Total Nickel	μg/L	—	7	—	ND	13	1.9
Dissolved Nickel	μg/L	74	5	0	ND	ND	ND
Total Selenium	μg/L	—	7	—	ND	ND	ND
Total Silver	μg/L	—	7	—	ND	ND	ND
Total Zinc	μg/L	—	8	—	0.015	123	49
Dissolved Zinc	μg/L	90	5	4	ND	13	10
Naphthalene [b]	μg/L	—	6	—	ND	ND	ND
Aldrin	μg/L	1.3	5	0	ND	ND	ND
Chlordane	μg/L	0.09	5	0	ND	ND	ND
Dieldrin	μg/L	0.71	5	0	ND	ND	ND
Endrin	μg/L	0.037	5	0	ND	ND	ND
Toxaphene	μg/L	0.21	5	0	ND	ND	ND
Heptachlor	μg/L	0.053	5	0	ND	ND	ND
Heptachlor Epoxide	μg/L	0.053	5	0	ND	ND	ND
O,P'-DDT	μg/L	—	5	—	ND	ND	ND
P,P'-DDT	μg/L	0.13	5	0	ND	ND	ND
PCB-1016 [c]	μg/L	0.03	5	0	ND	ND	ND
PCB-1221 [c]	μg/L	0.03	5	0	ND	ND	ND
PCB-1232 [c]	μg/L	0.03	5	0	ND	ND	ND
PCB-1242 [c]	μg/L	0.03	5	0	ND	ND	ND
PCB-1248 [c]	μg/L	0.03	5	0	ND	ND	ND

Table 33 (Continued)

SELECTED WATER QUALITY CONSTITUENTS IN BALLONA CHANNEL DURING WET-WEATHER

Constituent	Units	Acute CTR Criteria [a]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations Minimum	Maximum	Mean
PCB-1254 [c]	µg/L	0.03	5	0	ND	ND	ND
PCB-1260 [c]	mg/L	0.03	5	0	ND	ND	ND

— = No Criteria *CTR = California Toxics Rule* *NA = Not Analyzed*
ND = Not Detected *µg/l = micrograms per liter* *mg/l = milligrams per liter*
ppt = parts per thousand
MPN/100 ml = Most Probable Number per 100 milliliters

* *"Selected" water quality constituents represent thos water quality constituents most relevant to the analysis and discussion presented in this section. The data for all constituents sampled is contained in Volume I, Section 3, Water Resources Technical Report (Appendix F-1).*

[a] *For waters in which salinity is equal to or greater than 10 ppt and 95 percent or more of the time, the applicable criteria are the saltwater criteria.*

[b] *CTR criteria are for the protection of human health due to the consumption of aquatic organisms living in waters with carcinogenic compounds.*

[c] *CTR criteria are the chronic saltwater criteria for the protection of aquatic life. The CTR does not designate specific saltwater acute criteria for these constituents.*

Final CTR Criteria = May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California.

Aquatic Bioassay Consulting Laboratory, September 15, 1997. The Marine Environment of Marina del Rey Harbor, July 1996-June 1997.

Camp Dresser & McKee Inc., August 14, 1996. Ballona Creek Water and Sediment Quality Sediment Quality Report, 1995/1996, Wet Weather Season, Playa Vista, California.

Camp Dresser & McKee Inc., October 1998. Playa Vista Area A and Area B Wetlands Surface Water and Sediment Monitoring Report.

Chambers Group, Inc., March 1993. Comparison of the Re-establishment of Tidal Flow in the Ballona Wetlands Through the Ballona Channel or Through the Marina Del Rey Entrance Channel.

Woodward-Clyde Consultants, November 1990. Final Technical Appendix to the Master EIR. Table 5-7.

Source: Camp Dresser & McKee Inc.

the 303(d) program for the waterbodies of concern, as described in Subsection 3.1.1.4. All tables of existing data provided in Subsection 2.2 contain similarly selected constituents to help focus the discussion to those constituents of concern for each waterbody. Complete lists of the chemical constituents analyzed for the Ballona Channel are provided in Volume I, Section 3, of the Water Resources Technical Report (Appendix F-1).

Constituent levels in the saltwater portion of the Channel were comparable to concentrations in Santa Monica Bay and typical open-ocean concentrations for Southern California. Salinity measurements during both dry-weather and wet-weather indicate mean concentrations of 30 parts per thousand, and according to the CTR, saltwater criteria should be used for waters in which salinity is equal to or greater than 10 parts per thousand. Therefore, saltwater criteria were used to compare both wet and dry-weather measurements in the Ballona Channel.

During dry-weather sampling, the overall average dissolved oxygen and oil and grease concentrations were within the typical ocean range. Ammonia and phosphorus in the saltwater portion of the Channel were above the typical open-ocean ranges for these compounds. Pesticides and PCBs were not detected above laboratory detection limits. Dissolved copper, dissolved selenium, and dissolved zinc were detected above the chronic CTR water quality criteria during the dry-weather sampling period. Chronic CTR criteria were used for dry-weather flows because dry-weather frequently occurs for greater than 4 days, the averaging period to which the chronic CTR apply.

During wet-weather, dissolved copper and dissolved zinc were detected at levels exceeding acute CTR criteria. The acute CTR criteria were used for comparison to wet-weather due to the infrequent nature of storm events in southern California and the fact that most storm events last for less than 4 days, which is the averaging period for which chronic CTR criteria apply.

Sediment in the saltwater portion of the Ballona Channel was sampled by URSGWC in 1990,[165] Chambers/Soule in 1992,[166] ABCL in 1996/1997,[167] and CDM in 1996-1998. Constituents that exceeded guidance values (benchmarks, but not standards) are summarized in

[165] *Woodward-Clyde Consultants," Water Quality Impacts of the Proposed Playa Vista Development," November 1990.*

[166] *Chambers Group, Inc., Comparison of the Re-Establishment of Tidal Flow in the Ballona Wetlands Through the Ballona Channel or Through the Marina del Rey Entrance Channel. March 1993.*

[167] *Aquatic Bioassay and Consulting Laboratories, Inc. (ABCL), The Marine Environment of Marina del Rey Harbor July 1996-June 1997, September 15, 1997.*

Table 34 on page 422.[168] The term "benchmark" is used as an all-inclusive phrase to represent the applicable regulatory water quality standards and objectives, as well as from non-regulatory water quality objectives and guidelines. Suggested sediment criteria or benchmarks do not exist for nutrients and oil and grease. Oil and grease analytical results indicate highly variable levels of these constituents ranging from non-detect to 27,800 ppm. Total xylenes, lead, manganese, nickel, chlordane, p,p'-DDT, and p,p'-DDD were detected above probable effects level (PEL) guidance values. PEL is a non-regulatory guidance value, a benchmark for descriptive purposes, that represents the concentration of a compound above which adverse effects in organisms are frequently expected as observed during toxicity effects studies. These values are from reference tables compiled by the Coastal Protection & Restoration Division of the National Oceanic and Atmospheric Administration (NOAA).[169, 170] In the absence of California-established guidance criteria for sediments, these guidance values have been utilized as benchmarks for comparative purposes.

2.2.1.3 Ballona Wetlands

The Ballona Wetlands (the "Wetlands") receive urban runoff infrequently from the adjacent Playa Vista First Phase Project and the Proposed Project sites via the Freshwater Marsh. Freshwater reaches the Ballona Wetlands directly through precipitation and indirectly from discharges associated with land uses surrounding the Wetlands, including developments on the Westchester and Playa del Rey Bluffs and the Southern California Gas Company (SCGC) facility; runoff from Playa del Rey in the vicinity of Culver Boulevard, and from Culver Boulevard as it traverses the Wetlands; occasional overflows from the Pershing Drive Storm Drain; and infrequent overflows from the Freshwater Marsh during storm events greater than a 1-year design storm event. A design feature of the Freshwater Marsh also allows the flexibility to release additional freshwater to the Ballona Wetlands through a gated valve should it be necessary in conjunction with any future restoration of the salt marsh.

Dry-weather freshwater runoff into the Ballona Wetlands originates from off-site areas and results from such activities as excess and misapplied landscape irrigation onto pavement; car washing; street, driveway, and sidewalk cleaning; and emerging shallow groundwaters (e.g.,

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[168] *Camp Dresser & McKee Inc., Ballona Creek Salinity Monitoring and Water Quality Sampling Results, August 14, 1996, and Playa Vista Area A and Area B Wetlands Surface Water and Sediment Monitoring Report – Draft, October 27, 1998.*

[169] *Buchman, M. F., NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 1999, 12 pages.*

[170] *These reference tables are commonly referred to as the Screening Quick Reference Tables (SQuiRTs). The SQuiRTs include multiple screening values for sediment to reflect the range of possible adverse biological effects.*

Table 34

SELECTED* SEDIMENT QUALITY CONSTITUENTS IN BALLONA CHANNEL

Constituent	Units	NOAA Screening Quick Reference Table (SquiRT) Marine Sediment PELs	Total Number of Samples	Number of Samples Above Guidance Values	Observed Concentrations		
					Minimum	Maximum	Mean
Oil and Grease	mg/kg	—	11	—	ND	27,800	3,609
Tributyltin	mg/kg	—	7	—	ND	0.63	0.24
Hardness as $CaCO_3$	mg/kg	—	1	—	2,200	2,200	2,200
Total Hardness	mg/kg	—	1	—	33,000	33,000	33,000
Total Phosphorus	mg/kg	—	6	—	1.5	400	96
TKN	mg/kg	—	3	—	160	1100	504
Salinity	mg/kg	—	2	—	8,800	15,500	12,150
Total Xylenes	mg/kg	4	6	2	ND	33	9
Arsenic	mg/kg	41.6	11	0	ND	6.95	3.4
Cadmium	mg/kg	4.21	11	0	ND	1.58	0.55
Copper	mg/kg	108.2	11	0	8.1	42.3	25
Lead	mg/kg	112.18	11	3	ND	161	56
Manganese	mg/kg	260	7	1	ND	433	178
Mercury	mg/kg	0.696	11	0	ND	0.17	0.06
Nickel	mg/kg	42.8	11	1	ND	66.9	18
Selenium	mg/kg	1	6	0	ND	0.33	0.1
Silver	mg/kg	1.77	6	0	ND	0.663	0.11
Zinc	mg/kg	271	11	0	13	202	107
Aldrin	µg/kg	9.5	6	0	ND	ND	ND
Chlordane	µg/kg	4.76	7	4	ND	210	73
Dieldrin	µg/kg	4.3	6	0	ND	ND	ND
Endrin	µg/kg	—	6	—	ND	ND	ND
Toxaphene	µg/kg	—	6	—	ND	ND	ND
Heptachlor	µg/kg	0.3	6	0	ND	ND	ND
Heptachlor Epoxide	µg/kg	—	7	—	ND	ND	ND
O,P'-DDT	µg/kg	—	4	0	ND	ND	ND
P,P'-DDT	µg/kg	4.77	8	4	ND	160	39
P,P'-DDD	µg/kg	7.81	11	3	ND	190	34
Total DDT	µg/kg	51.7	1	0	17.8	17.8	18
PCB-1016	µg/kg	188.79	6	0	ND	ND	ND
PCB-1221	µg/kg	188.79	6	0	ND	ND	ND
PCB-1232	µg/kg	188.79	6	0	ND	ND	ND
PCB-1242	µg/kg	188.79	6	0	ND	ND	ND
PCB-1248	µg/kg	188.79	6	0	ND	ND	ND

Table 34

SELECTED* SEDIMENT QUALITY CONSTITUENTS IN BALLONA CHANNEL

Constituent	Units	NOAA Screening Quick Reference Table (SquiRT) Marine Sediment PELs	Total Number of Samples	Number of Samples Above Guidance Values	Observed Concentrations		
					Minimum	Maximum	Mean
PCB-1254	µg/kg	188.79	10	0	ND	20	2
PCB-1260	µg/kg	188.79	6	0	ND	ND	ND

— = No Guidance Value
NA = Not Analyzed
SW = Saltwater
mg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
PEL=- Probable Effects Level
ND = Not Detected
NOAA SQuiRT = National Oceanic and Atmospheric Administration Screening Quick Reference Tables

* *"Selected" water quality constituents represent those water quality constituents most relevant to the analysis and discussion presented in this section. The data for all constituents sampled is contained in Volume I, Section 3, Water Resources Technical Report (Appendix F-1).*

Aquatic Bioassay Consulting Laboratory, September 15, 1997. The Marine Environment of Marina del Rey Harbor July 1996 – June 1997.
Buchman, M. F., 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pages.
Camp Dresser & McKee Inc., August 14, 1996. Ballona Creek Water and Sediment Quality Sediment Quality Report, 1995/1996, Wet Weather Season, Playa Vista, California.
Camp Dresser & McKee Inc., October 1998. Playa Vista Area A and Area B Wetlands Surface Water and Sediment Monitoring Report.
Chambers Group, Inc., March 1993. Comparison of the Re-establishment of Tidal Flow in the Ballona Wetlands Through the Ballona Channel or Through the Marina Del Rey Entrance Channel.
Woodward-Clyde Consultants, November 1990. Final Technical Appendix to the Master EIR. Table 5-7.

Source: Camp Dresser & McKee Inc.

leakage of shallow groundwater into storm drain pipes). Other potential sources include accidental sewer overflows and illegal industrial and commercial off-site discharges. Limited tidal exchange between the Ballona Channel and the Ballona Wetlands could bring these sources into the Wetlands from the Channel.

These limited tidal exchanges also provide another source of surface water to the Wetlands. During and following storm events, water in the Wetlands is primarily dominated by wet-weather runoff, which is temporarily detained within the Wetlands, for a period depending on the height of stormwater flows within Ballona Channel. In smaller storm events the detention times could be quite low depending on tide levels.

Runoff pollutants are removed by naturally occurring processes (wetland function) as runoff passes through the Ballona Wetlands. Due to its location, the Ballona Wetlands function as a runoff detention basin that supports plant and animal life. In natural wetland systems, processes such as sedimentation, filtration, biodegradation, and plant uptake typically remove particulate and organic matter. However, the flow pathways in much of the Wetlands are channelized and therefore, for many smaller storms, the detention times and resulting treatment rates are likely not as large as would be expected in wetlands specifically constructed or managed to maximize detention times. Under dry-weather conditions, detention times are likely more significant, although difficult to estimate.

Table 35, Table 36, and Table 37 on pages 425 through 429 list selected water and sediment quality constituents in the Ballona Wetlands. All sample locations are shown on Figure 3-1 in Volume I, Section 3, of the Water Resources Technical Report (Appendix F-1). The water quality in the Ballona Wetlands had salinity concentrations similar to the Ballona Channel because the Channel and Wetlands are tidally connected (via flapgates).

Comparing wet- and dry-weather average concentrations in the Ballona Wetlands to those of the Ballona Channel, the dry-weather Ballona Wetlands concentrations were higher for total and dissolved arsenic and nickel, and the dry-weather Ballona Channel concentrations were higher for total and dissolved copper and zinc. Concentrations of total lead and selenium were higher in the Ballona Channel during dry-weather, but were higher in Ballona Wetlands during wet-weather. All other metals concentrations were similar in magnitude or were not detected. Wet-weather concentrations of dissolved copper exceeded acute CTR criteria in the sample from the effluent of the Ballona Wetlands to the Ballona Channel. During dry-weather, dissolved arsenic, copper, nickel, selenium, and alpha-BHC were higher than chronic CTR criteria. The dry-weather exceedances were in various locations throughout the Ballona Wetlands and were not specific to a particular sampling location or period. All data used for this analysis are provided in the Water Resources Technical Report (Appendix F-1).

Table 35

SELECTED* WATER QUALITY CONSTITUENTS IN BALLONA WETLANDS DURING DRY-WEATHER

Constituent	Units	Chronic CTR Criteria [a]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations		
					Minimum	Maximum	Mean
Oil & Grease	µg/L	—	5	—	ND	0.62	0.349
Total Coliform	MPN/100m	—	5	—	ND	ND	ND
Fecal Coliform	MPN/100m	—	5	—	ND	ND	ND
Hardness	mg/L	—	7	—	140	14,000	5,187
TKN	mg/L	—	6	—	1.1	3.4	2.53
Total Phosphorus	mg/L	—	6	—	0.044	1.6	0.53
Total Suspended Solids	mg/L	—	1	—	16	16	16
Salinity	ppt	—	5	—	31	79	42.8
Dissolved Arsenic	µg/L	36	8	1	ND	66	15.72
Total Arsenic	µg/L	—	7	—	2.1	59	15.18
Dissolved Cadmium	µg/L	9.3	8	0	0.1	0.11	0.04
Total Cadmium	µg/L	—	7	—	ND	0.49	0.11
Dissolved Copper	µg/L	3.1	8	10	5	20	9.02
Total Copper	µg/L	—	7	—	22.3	50.6	18.2
Dissolved Lead	µg/L	8.1	8	1	ND	2.91	0.57
Total Lead	µg/L	—	7	—	2.01	12	3.51
Dissolved Mercury	µg/L	—	8	—	ND	ND	ND
Total Mercury	µg/L	—	7	—	ND	ND	ND
Dissolved Nickel	µg/L	8.2	8	2	2.27	9	4.0
Total Nickel	µg/L	—	7	—	3.69	13	4.4
Dissolved Selenium	µg/L	71	8	1	ND	270	48.64
Total Selenium	µg/L	—	7	—	6.59	260	58.01
Dissolved Silver	µg/L	—	8	—	ND	0.12	0.02
Total Silver	µg/L	—	7	—	ND	0.31	0.04
Dissolved Zinc	µg/L	81	8	0	14	54	29.51
Total Zinc	µg/L	—	7	—	11	72.9	28.66
Acenaphthene [b]	µg/L	2700	4	0	ND	ND	ND
Acenaphthylene [b]	µg/L	—	4	—	ND	ND	ND
Anthracene [b]	µg/L	110000	4	0	ND	ND	ND
Benzo(a)anthracene [b]	µg/L	0.049	4	0	ND	ND	ND
Benzo(a)pyrene [b]	µg/L	0.049	4	0	ND	ND	ND
Benzo(b)fluoranthene [b]	µg/L	0.049	4	0	ND	ND	ND
Benzo(g,h,i)perylene [b]	µg/L	—	4	—	ND	ND	ND
Benzo(k)fluoranthene [b]	µg/L	0.049	4	0	ND	ND	ND
Chrysene [b]	µg/L	0.049	4	0	ND	ND	ND
Dibenzo(a,h)anthracene [b]	µg/L	0.049	4	0	ND	ND	ND
Fluoranthene [b]	µg/L	370	4	0	ND	ND	ND
Fluorene [b]	µg/L	14000	4	0	ND	ND	ND
Naphthalene [b]	µg/L	—	4	—	ND	ND	ND
Phenanthrene [b]	µg/L	—	4	—	ND	ND	ND
Pyrene [b]	µg/L	11000	4	0	ND	ND	ND
4,4'-DDT	µg/L	0.001	4	0	ND	ND	ND
Aldrin [c]	µg/L	1.3	4	0	ND	ND	ND
alpha-BHC [b]	µg/L	0.013	4	2	ND	0.045	0.02
Chlordane	µg/L	0.004	4	0	ND	ND	ND

Table 35 (Continued)

SELECTED WATER QUALITY CONSTITUENTS IN BALLONA WETLANDS DURING DRY-WEATHER

Constituent	Units	Chronic CTR Criteria [a]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations		
					Minimum	Maximum	Mean
Dieldrin	µg/L	0.0019	4	0	ND	ND	ND
Endosulfan I	µg/L	—	4	—	ND	ND	ND
Endosulfan II	µg/L	—	4	—	ND	ND	ND
Endrin	µg/L	0.0023	4	0	ND	ND	ND
Heptachlor Epoxide	µg/L	0.0036	4	0	ND	ND	ND
Heptachlor	µg/L	0.0036	4	0	ND	ND	ND
Aroclor-1016	µg/L	0.03	4	0	ND	ND	ND
Aroclor-1221	µg/L	0.03	4	0	ND	ND	ND
Aroclor-1232	µg/L	0.03	4	0	ND	ND	ND
Aroclor-1242	µg/L	0.03	4	0	ND	ND	ND
Aroclor-1248	µg/L	0.03	4	0	ND	ND	ND
Aroclor-1254	µg/L	0.03	4	0	ND	ND	ND
Aroclor-1260	µg/L	0.03	4	0	ND	ND	ND
Chloropyrifos	µg/L	—	4	—	ND	ND	ND

— = No Criteria *CTR = California Toxics Rule* *µg/L = micrograms per liter*
NA = Not Analyzed *N/A = Not Applicable* *mg/L = milligrams per liter*
ND = Not Detected *ppt = parts per thousand*
MPN/100 ml = Most Probable Number per 100 milliliters

[a] *For waters in which salinity is equal to or greater than 10 ppt and 95 percent or more of the time, the applicable criteria are the saltwater criteria.*
[b] *CTR Criteria are from human health organisms only criteria.*
[c] *CTR does not designate specific saltwater chronic criteria for these constituents.*

Final CTR Criteria = May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California.
Woodward-Clyde Consultants, November 1990. Final Technical Appendix to the Master EIR. Table 5-2.
Camp Dresser & McKee Inc., October 1998. Playa Vista Area A and Area B Wetlands Surface Water and Sediment Monitoring Report.
GeoSyntec Consultants, 2000. Data.

Source: Camp Dresser & McKee Inc.

Table 36

SELECTED* WATER QUALITY CONSTITUENTS IN BALLONA WETLANDS DURING WET-WEATHER

Constituent	Units	CTR Acute Criteria [a]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations Minimum	Maximum	Mean
Total Hardness	mg/L	—	2	—	346	1,980	1,163
Total Suspended Solids	mg/L	—	2	—	73	187	130
Dissolved Arsenic	µg/L	69	2	0	3.02	6.79	4.905
Total Arsenic	µg/L	—	2	—	4.73	7.06	5.895
Dissolved Copper	µg/L	4.8	2	1	3.25	7.19	5.22
Total Copper	mg/L	—	2	—	13.5	24.6	19.05
Total Lead	mg/L	—	2	—	12.9	17.6	15.25
Dissolved Nickel	mg/L	74	2	0	2.23	2.74	2.485
Total Nickel	mg/L	—	2	—	4.27	9.94	7.105
Dissolved Selenium	mg/L	290	2	0	4.78	23.3	14.04
Total Selenium	mg/L	—	2	—	2.43	21	11.715
Dissolved Zinc	mg/L	90	2	0	14.6	19.9	17.25
Total Zinc	mg/L	—	2	—	29.2	131	80.1

— = No Criteria *CTR = California Toxics Rule* *ppt = parts per thousand*
NA = Not Analyzed *µg/L = micrograms per liter* *mg/L = milligrams per liter*
ND = Not Detected
MPN/100 ml = Most Probable Number per 100 milliliters

* *"Selected" water quality constituents represent those water quality constituents most relevant to the analysis and discussion presented in this section. The data for all constituents sampled is contained in Volume I, Section 3, Water Resources Technical Report (Appendix F-1).*

[a] *For waters in which salinity is equal to or greater than 10 ppt and 95 percent or more of the time, the applicable criteria are the saltwater criteria.*

Final CTR Criteria = May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California.
GeoSyntec Consultants, 2000. Data.

Source: Camp Dresser & McKee Inc.

Table 37

SELECTED* SEDIMENT QUALITY CONSTITUENTS IN BALLONA WETLANDS

Constituent	Units	NOAA SQuiRT Marine Sediment PELs	Total Number of Samples	Number of Samples Above Guidance Values	Observed Concentrations		
					Minimum	Maximum	Mean
Oil and Grease	mg/kg	—	3	—	62	2100	1081
Salinity	mg/kg	—	5	—	ND	17000	8960
TKN	mg/kg	—	5	—	190	680	520
Total Phosphorus	mg/kg	—	5	—	240	380	280
Acenaphthene	mg/kg	88.9	2	0	ND	ND	ND
Acenaphthylene	mg/kg	127.87	2	0	ND	ND	ND
Anthracene	mg/kg	245	2	0	ND	ND	ND
Benz(a)anthracene	mg/kg	692.53	2	0	ND	ND	ND
Benzo(a)pyrene	mg/kg	763.22	2	0	ND	ND	ND
Benzo(b)fluoranthene[a]	mg/kg	1800	2	0	ND	ND	ND
Benzo(g,h,i)perylene	mg/kg	670	2	0	ND	ND	ND
Benzo(k)fluoranthene[a]	mg/kg	1800	2	0	ND	ND	ND
Chrysene	mg/kg	845.98	2	0	ND	ND	ND
Dibenz(a,h)anthracene	mg/kg	134.61	2	0	ND	ND	ND
Fluoranthene	mg/kg	1493.54	2	0	ND	ND	ND
Fluorene	mg/kg	144.35	2	0	ND	ND	ND
Indeno(1,2,3-c,d)pyrene[a]	mg/kg	600	2	0	ND	ND	ND
Naphthalene	mg/kg	390.64	2	0	ND	ND	ND
Phenanthrene	mg/kg	543.53	2	0	ND	ND	ND
Pyrene	mg/kg	1397.6	2	0	ND	ND	ND
Arsenic	mg/kg	8.2	10	0	ND	4.21	2.9
Barium[a]	mg/kg	48	3	2	47.3	147	112.4
Cadmium	mg/kg	1.2	10	0	ND	2.24	1.0
Copper	mg/kg	34	10	0	14.1	63	29.4
Lead	mg/kg	46.7	10	2	3.2	258	68
Mercury	mg/kg	0.15	10	0	ND	0.184	0.06
Nickel	mg/kg	20.9	10	0	7	29	18.3
Selenium[a]	mg/kg	—	10	—	ND	ND	ND
Silver	mg/kg	1	10	0	ND	1.21	0.28
Zinc	mg/kg	150	10	2	40	359	145
Aldrin[a]	µg/kg	9.5	2	0	ND	ND	ND
Dieldrin	µg/kg	4.3	2	0	ND	ND	ND
Endosulfan I	µg/kg	—	2	—	ND	ND	ND
Endosulfan II	µg/kg	—	2	—	ND	ND	ND
Endrin	µg/kg	—	2	—	ND	ND	ND
Heptachlor Epoxide	µg/kg	—	2	—	ND	ND	ND
Heptachlor[a]	µg/kg	0.3	2	0	ND	ND	ND
PCB-1016	µg/kg	188.79	2	0	ND	ND	ND
PCB-1221	µg/kg	188.79	2	0	ND	ND	ND
PCB-1232	µg/kg	188.79	2	0	ND	ND	ND

Table 37 (Continued)

SELECTED SEDIMENT QUALITY CONSTITUENTS IN BALLONA WETLANDS

Constituent	Units	NOAA SQuiRT Marine Sediment PELs	Total Number of Samples	Number of Samples Above Guidance Values	Observed Concentrations		
					Minimum	Maximum	Mean
PCB-1242	µg/kg	188.79	2	0	ND	ND	ND
PCB-1248	µg/kg	188.79	2	0	ND	ND	ND
PCB-1262	µg/kg	188.79	2	0	ND	ND	ND
Toxaphene	µg/kg	—	2	—	ND	ND	ND
P,P'-DDT	µg/kg	4.77	3	1	ND	6.9	2.3
PCB-1254	µg/kg	188.79	3	0	ND	ND	ND
PCB-1260	µg/kg	188.79	3	0	ND	92	31
Chlordane	µg/kg	4.79	3	1	ND	84	28

— = No Guidance Value *µg/kg = micrograms per kilogram* *NA = Not Analyzed*
mg/kg = milligrams per kilogram *ND = Not Detected* *SW = Saltwater*
PEL = Probable Effects Level
NOAA SQuiRT = National Oceanic and Atmospheric Administration Screening Quick Reference Tables.

* *"Selected" water quality constituents represent those water quality constituents most relevant to the analysis and discussion presented in this section. The data for all constituents sampled is contained in Volume I, Section 3, Water Resources Technical Report (Appendix F-1).*

[a] *Apparent Effects Threshold (AET) is listed instead of PEL because PEL is not listed for this constituent.*

Woodward-Clyde Consultants, November 1990. Final Technical Appendix to the Master EIR.
Buchman, M.F., 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pages. 1990, November. Woodward-Clyde Consultants, Final Technical Appendix to the Master EIR. Table 5-2.
Camp Dresser & McKee Inc., October 1998. Playa Vista Area A and Area B Wetlands Surface Water and Sediment Monitoring Report.
GeoSyntec Consultants, 2000. Data.

Source: Camp Dresser & McKee Inc.

Sediment in the drainage channels of the Ballona Wetlands was sampled in 1990, 1998, and 2000. Barium, lead, zinc, p,p'-DDT, and chlordane were detected above PEL guidance values. Mercury was detected in sediment but not in surface water samples. In addition, selenium was detected in surface water samples but not in sediment samples. Overall, the existing water and sediment quality data in the Ballona Wetlands are relatively free of contamination from potentially toxic organic contaminants (pesticides, PCBs, VOCs, SVOCs), but contain certain metals detected at levels above benchmark values in both the water and sediment. Exceedances were not consistent for all samples. Sampling results suggest past and continuing influence of urban runoff, as evidenced by the detection of lead and zinc concentrations in excess of sediment benchmarks.

2.2.1.4 Freshwater Marsh

The Freshwater Marsh receives urban runoff directly from the adjacent Playa Vista First Phase Project and the Proposed Project sites in addition to off-site properties (e.g., bluff and light industrial/residential areas north of Jefferson Boulevard). It is designed to have the capacity to process runoff from low flows up to a 1-year design storm event (at buildout) and has the flexibility to release freshwater to the Ballona Wetlands through a gated valve, should it be necessary in conjunction with any future restoration of the salt marsh. Substantial portions of the Freshwater Marsh were constructed in 2001-2002 as part of the adjacent Playa Vista First Phase Project. Only the southern portion of the Freshwater Marsh (approximately 8 acres) currently remains to be constructed.

Existing dry-weather flows within the adjacent Playa Vista First Phase Project and the Proposed Project sites are minimal due to the largely undeveloped nature of the site and the erosion control plans and BMPs implemented as part of the adjacent Playa Vista First Phase Project. There is also a minimal amount of dry-weather flow from treated groundwater dewatering from the adjacent Playa Vista First Phase Project. The quality of dry-weather runoff is influenced by the source of water, as well as, the pollutants the flow picks up as it is conveyed through the drainage system. Runoff in urban areas may contain pesticides, garden fertilizers, oil/grease, street litter, and waste.[171] Runoff pollutants in the Freshwater Marsh are removed by naturally occurring processes (such as sedimentation, filtration, biodegradation, and plant uptake, which typically remove particulate and organic matter) as runoff passes through the Marsh. The Freshwater Marsh, with its longer detention times, is expected to perform this function better than the Ballona Wetlands.

Water in the Freshwater Marsh was sampled near its inlets and outlets during its construction. Three sampling events occurred during dry-weather conditions (April 2002,[172] June 2002,[173] and April 2003[174]). As shown in Table 38 on pages 431 and 432, there were no exceedances of freshwater chronic CTR[175] criteria during dry-weather conditions in the samples

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[171] *Santa Monica Bay Project and Southern California Association of Governments, State of the Bay, Scientific Assessment, November 1988, page 3-35.*

[172] *Camp Dresser & McKee Inc., 2002. Tables reporting sampling results from April 25, 2002.*

[173] *Camp Dresser & McKee Inc., 2002. Tables reporting sampling results from June 28, 2002.*

[174] *Camp Dresser & McKee Inc., 2003. Tables reporting sampling results from April 2, 2003.*

[175] *The CTR criteria are water quality standards legally applicable to selected waters with human health or aquatic life designations, such as the Ballona Channel and the Ballona Wetlands; however, in reference to the Freshwater Wetlands System components, the CTR criteria are used as numerical water quality reference levels for comparative purposes only.*

Table 38

SELECTED* WATER QUALITY CONSTITUENTS IN FRESHWATER MARSH DURING DRY-WEATHER

Constituent	Units	Chronic CTR Criteria [a]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations		
					Minimum	Maximum	Mean
Fecal Coliforms	MPN/100 ml	—	3	—	42	8	4.67
Total Coliforms	MPN/100 ml	—	3	—	13	23	17
Total Suspended Solids	mg/l	—	46	—	ND	39	21.33
Salinity	g/l	—	46	—	ND	2	0.92
Oil and Grease	mg/l	—	46	—	ND	0.44	0.19
TKN	mg/l	—	3	—	0.37	0.72	0.59
Total Phosphorus	mg/l	—	3	—	0.15	0.64	0.41
Hardness	mg/l	—	6	—	156	800	453
Acenaphthene [b]	μg/l	2,700	3	0	ND	ND	ND
Acenaphthylene	μg/l	—	3	—	ND	ND	ND
Anthracene [b]	μg/l	110,000	3	0	ND	ND	ND
Benzo(a)anthracene [b]	μg/l	0.049	3	0	ND	ND	ND
Benzo(a)pyrene [b]	μg/l	0.049	3	0	ND	ND	ND
Benzo(b)fluoranthene [b]	μg/l	0.049	3	0	ND	ND	ND
Benzo(g,h,i)perylene [b]	μg/l	—	3	—	ND	ND	ND
Benzo(k)fluoranthene [b]	μg/l	0.049	3	0	ND	ND	ND
Chrysene [b]	μg/l	0.049	3	0	ND	ND	ND
Dibenzo(a,h)anthracene [b]	μg/l	0.049	3	0	ND	ND	ND
Fluoranthene [b]	μg/l	370	3	0	ND	ND	ND
Fluorene [b]	μg/l	14,000	3	0	ND	ND	ND
Indeno(1,2,3-c.d) pyrene	μg/l	0.049	1	0	ND	ND	ND
Naphthalene	μg/l	—	1	—	ND	ND	ND
Phenanthrene	μg/l	—	3	—	ND	ND	ND
Pyrene [b]	μg/l	11,000	3	0	ND	ND	ND
Dissolved Arsenic	μg/l	150	46	0	6	8.4	7.07
Total Arsenic	μg/l	—	9	—	6.1	11	8.5
Dissolved Cadmium	μg/l	6.2	46	0	ND	0.2	0.09
Total Cadmium	μg/l	—	9	—	ND	0.2	0.13
Dissolved Copper	μg/l	29	46	0	43.2	6.7	5.03
Total Copper	μg/l	—	9	—	3.5	16	9.37
Dissolved Lead	μg/l	11	46	0	ND	2.9	0.70
Total Lead	μg/l	—	9	—	ND	1.8	0.56
Dissolved Mercury	μg/l	—	46	—	ND	ND	ND
Total Mercury	μg/l	—	9	—	ND	ND	ND
Dissolved Nickel	μg/l	170	46	0	1.9	3.8	2.88
Total Nickel	μg/l	—	9	—	2.04	5.6	3.76
Dissolved Selenium	μg/l	—	46	—	ND	ND	ND
Total Selenium	μg/l	5	9	0	ND	ND	ND
Dissolved Silver	μg/l	—	46	—	ND	ND	ND
Total Silver	μg/l	—	9	—	ND	0.2	0.02
Dissolved Zinc	μg/l	380	46	0	1.2	28	12.25
Total Zinc	μg/l	—	9	—	1.7	16	9.78
P,P'-DDT	μg/l	0.001	3	0	ND	ND	ND
Aldrin [c]	μg/l	3	3	0	ND	ND	ND
Dieldrin	μg/l	0.056	3	0	ND	ND	ND
Endosulfan I	μg/l	0.056	3	0	ND	ND	ND

Table 38 (Continued)

SELECTED WATER QUALITY CONSTITUENTS IN FRESHWATER MARSH DURING DRY-WEATHER

Constituent	Units	Chronic CTR Criteria [a]	Total Number of Samples	Number of Samples Exceeding Criteria	Observed Concentrations		
					Minimum	Maximum	Mean
Endosulfan II	μg/l	0.056	3	0	ND	ND	ND
Endrin	μg/l	0.036	3	0	ND	ND	ND
Heptachlor Epoxide	μg/l	0.52	3	0	ND	ND	ND
Heptachlor	μg/l	0.52	3	0	ND	ND	ND
PCB-1016	μg/l	0.014	3	0	ND	ND	ND
PCB-1221	μg/l	0.014	3	0	ND	ND	ND
PCB-1232	μg/l	0.014	3	0	ND	ND	ND
PCB-1242	μg/l	0.014	3	0	ND	ND	ND
PCB-1248	μg/l	0.014	3	0	ND	ND	ND
PCB-1254	μg/l	0.014	3	0	ND	ND	ND
PCB-1260	μg/l	0.014	3	0	ND	ND	ND

— = No Criteria *CTR = California Toxics Rule* *NA = Not Analyzed*
ND = Not Detected *μg/l = micrograms per liter* *mg/l = milligrams per liter*
MPN/100 ml = Most Probable Number per 100 milliliters

Final CTR Criteria = May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California.

Camp Dresser & McKee Inc., April 25 and June 28, 2002. Freshwater Marsh Water Quality Sampling, Dry Weather, Playa Vista, California.

Camp Dresser & McKee Inc., April 2, 2003. Freshwater Marsh Water Quality Sampling, Dry Weather, Playa Vista, California.

* *"Selected" water quality constituents represent those water quality constituents most relevant to the analysis and discussion presented in this section. The data for all constituents sampled is contained in Volume I, Section 3, Water Resources Technical Report (Appendix F-1).*

[a] *CTR Criteria was calculated using the mean hardness for all freshwater dry weather samples collected in the Freshwater Marsh. Since the mean hardness was 453 mg/l (greater than the maximum set by the CTR), a hardness of 400 mg/l was used.*

[b] *CTR criteria are for the protection of human health due to the consumption of aquatic organisms living in waters with carcinogenic compounds. CTR does not designate specific freshwater chronic criteria for these constituents.*

[c] *CTR criteria shown are the freshwater acute criteria for the protection of aquatic life. CTR does not designate specific freshwater chronic criteria for these constituents.*

Source: Camp Dresser & McKee Inc.

taken during these sampling events. In Table 38, freshwater chronic CTR criteria were used for comparison because the Freshwater Marsh is not a saltwater habitat and the biology of the waterbody is dominated by freshwater aquatic life. In addition, there is a distinct separation between the Freshwater Marsh and the downstream saltwater marsh (i.e., Ballona Wetlands) in the form of the physical berm separating the two that serves as the hydrologic control mediating the exchange between them. Therefore, freshwater criteria are appropriate.

All data used for this analysis are provided in the Water Resources Technical Report (Appendix F-1).

2.2.1.5 Point Source Pollutant Loadings

The groundwater beneath the adjacent Playa Vista First Phase Project and the Proposed Project and their vicinity has been contaminated from previous industrial operations in the area and surrounding off-site locations (see Subsection 2.2.2, Groundwater Quality, below). The only continuous point source discharge within the adjacent Playa Vista First Phase Project and the Proposed Project was from the former groundwater treatment facility (GWTF) operating at the former Howard Hughes Plant Site, in the eastern portion of the adjacent Playa Vista First Phase Project. Following a 60-day start-up period, groundwater remediation began on a continuous basis in August 1994.[176] The system extracted contaminated groundwater and removed volatile organic compounds using air stripping. Treated water, which was monitored weekly to monthly for quality, was discharged to the Centinela Creek under a RWQCB NPDES permit that included limits on discharge concentrations.

In June 2000, operation of the groundwater extraction system was suspended with RWQCB approval, due to grading and construction of the adjacent Playa Vista First Phase Project, and the GWTF was temporarily decommissioned. Since September 2000, a new and more efficient groundwater treatment system, designed to treat a wider range of contaminants, was installed for remediation-related activities and for construction dewatering for construction of the adjacent Playa Vista First Phase Project. This facility is located on the north side of Building 2 within the adjacent Playa Vista First Phase Project, east of the Proposed Project site, and operates under NPDES Permit #CAG914001. Currently, one other temporary portable GWTF serves the adjacent Playa Vista First Phase Project. The facility is located within the western portion of the adjacent Playa Vista First Phase Project site, east of Lincoln Boulevard, and south of Jefferson Boulevard, near Runway Road. This facility is presently in operation for treatment of construction dewatering and operates under NPDES Permit #CAG994002. As construction of the adjacent Playa Vista First Phase Project progresses, additional treatment facilities will be added as deemed necessary, and with the approval of the RWQCB, for specific construction dewatering and remediation efforts. A groundwater treatment program for the adjacent Playa Vista First Phase Project and the Proposed Project will be implemented, as necessary, in accordance with RWQCB requirements in conjunction with ongoing implementation of Cleanup and Abatement Order (CAO) No. 98-125. As an alternative to

[176] *Broten, Scott, Project Manager, SECOR International Inc., Telephone Communication, March 4, 1996.*

treatment on site and discharge of construction dewatering under an existing NPDES permit, an Industrial Waste Discharge Permit (W-502105) has been obtained from the City of Los Angeles, Bureau of Sanitation, which allows construction dewatering water to be discharged to the sanitary sewer. The existing extraction wells will be abandoned or relocated in accordance with RWQCB requirements. For a discussion of this remediation program, refer to Section IV.I, Safety/Risk of Upset, Subsection 2.2.3. Along with on- and off-site urban runoff, the discharge of treated groundwater is one of the potential water sources for the Riparian Corridor and Freshwater Marsh.

As part of the adjacent Playa Vista First Phase Project's SWPPP and Erosion Control Plan, a temporary detention basin (located south of Runway Road and west of Building 45) has been constructed in the Proposed Project site. The detention basin provides temporary storm drainage for the adjacent Playa Vista First Phase areas currently under construction that will ultimately discharge into the Riparian Corridor, as well as portions of the eastern portion of the adjacent Playa Vista First Phase Project site, which would ultimately discharge to the Central Storm Drain. The basin will be removed when construction of these areas is complete and the portion of the Riparian Corridor adjacent to the Playa Vista First Phase residential areas is constructed.

2.2.2 Groundwater Quality

The aquifer units underlying the adjacent Playa Vista First Phase Project and the Proposed Project are the Bellflower Aquitard (from near the surface to 35 feet below ground surface (bgs)), the Ballona Aquifer (approximately 35 to 50 feet bgs), and the Silverado Aquifer (from 100 to 200 feet bgs). The hydrogeology and stratigraphy of the groundwater system beneath the adjacent Playa Vista First Phase Project and the Proposed Project sites are discussed in detail in Section IV.C(1), Hydrology. This subsection describes the existing groundwater quality beneath the Proposed Project area and vicinity, including salinity levels and pollutant concentrations in the groundwater.

2.2.2.1 Salinity

Groundwater samples from monitoring wells in the Silverado Aquifer[177] (deeper aquifer) indicate high chloride concentrations and a high level of total dissolved solids (TDS) concentrations ranging from 800 to 2,000 mg/L, well above the recommended level of 1,000 mg/L for drinking water. TDS is a general measure of salinity, and these concentrations are indicative of the degradation of groundwater from seawater intrusion.

[177] *Aquifer – a body of rock sediment that is sufficiently permeable to conduct ground water and to yield economically significant quantities of water to wells and springs.*

Groundwater quality within the shallower Ballona Aquifer system is also considered degraded as a consequence of past overproduction of shallow groundwater and/or seawater inland penetration. Based on groundwater sampling in three wells during the third quarter of 1999, the TDS concentrations within the Ballona Aquifer system underlying the adjacent Playa Vista First Phase Project and the Proposed Project ranged from 500 mg/L to 4,200 mg/L.[178, 179] These values are higher than the drinking water standards in the Basin Plan (500 mg/L), and are likely due to the proximity to the ocean.[180] Currently, no wells on or near the sites of the adjacent Playa Vista First Phase Project and the Proposed Project extract groundwater from the Ballona Aquifer for domestic uses or irrigation.

2.2.2.2 Other Constituents In Groundwater

Contamination within the adjacent Playa Vista First Phase Project and Proposed Project sites is a result of past industrial activities. A reduction in the levels of contamination within the area is a result of the ongoing soil and groundwater remediation activities. The ongoing remediation is another factor affecting groundwater quality.

The Bellflower Aquitard and Ballona and Silverado Aquifers were sampled for priority pollutants,[181] metals, volatile and extractable organic compounds, pesticides, and PCBs on several occasions between 1988 and 2000 and are currently monitored to establish concentration trends. During these events, numerous wells were sampled in the Proposed Project area. No pesticides or PCBs were detected in any samples.[182, 183] Solvent and total petroleum hydrocarbons (TPH) contamination was identified during the 1987 through 2000 groundwater sampling in the adjacent Playa Vista First Phase Project and the Proposed Project sites. As discussed in Section IV.I, Safety/Risk of Upset, there are six study areas within the Proposed Project site and three areas within the adjacent Playa Vista First Phase Project site that were identified as

[178] *Range in numbers is due to location in relation to the Santa Monica Bay. These TDS values represent the results of the last round of sampling that tested for TDS within the First and Second Phase Projects. As of the Third Quarter 1999 sampling event, the RWQCB agreed that TDS levels from the historical sampling data were consistent, and at this time sufficient for the RWQCB, and that no further sampling was required.*

[179] *Camp Dresser & McKee Inc., "Third Quarter 1999 Groundwater Monitoring and Progress Report," November 12, 1999.*

[180] *The Ballona Creek watershed does not have a site-specific TDS standard listed in the Basin Plan. However, the Ballona Creek is designated as having a potential municipal water supply beneficial use.*

[181] *Priority Pollutants are toxic compounds for which Cal EPA establishes numeric criteria in order to define thresholds for pollutant levels in waterbodies.*

[182] *LeRoy Crandall and Associates, Groundwater Monitoring Well Installation and Sampling, Water Quality Study, Playa Vista Project, August 21, 1990, page 10.*

[183] *Camp Dresser & McKee, Inc., Second Quarter 2000 Groundwater Monitoring and Progress Report April-June 2000, July 17, 2000, Section 5.*

potential sources of impacted groundwater that could potentially affect the Proposed Project site. Two of the six areas of concern within the Proposed Project site are the former Temporary Drum Storage Area and the former Salvage Yard Area (see Figure 57 on page 684 in Section IV.I, Safety/Risk of Upset, for a map of these areas of potential environmental concern). Monitoring wells were installed in these two areas as part of the quarterly groundwater sampling network for the Proposed Project site.[184] A discussion of the findings with respect to groundwater quality can be found in Subsection 2.2.3.2.1 of Section IV.I, Safety/Risk of Upset, of this EIR.

Groundwater under the former Salvage Yard Area has been sampled quarterly since the first quarter of 1999. During the initial sampling, groundwater was analyzed for priority pollutants, including PCBs, pesticides, VOCs, TPH, and CAM 17 metals. Because PCBs and pesticides were not detected, subsequent groundwater samples collected during the second and third quarters of 1999 were analyzed for VOCs, CAM 17 metals, and TPH. Starting with the fourth quarter of 1999, groundwater samples have been collected quarterly and analyzed for VOCs and TPH. Between the first quarter of 1999 and second quarter of 2003, groundwater samples had detectable concentrations[185] of PCE (0.8 to 3.1 μg/L), TCE (2.0 to 42 μg/L), 1,1,1-TCA (0.6 to 3.2 μg/L), 1,1-DCE (0.6 to 1.5 μg/L), 1,1-DCA (0.5 to 27 μg/L), cis-1,2-DCE (0.8 to 21 μg/L), trans-1,2-DCE (0.5 to 3.9 μg/L), toluene (vinyl chloride (2.4 to 33 μg/L), and TPH-cc (220 to 690 μg/L).[186] Toluene was detected at a concentration of 2.1 μg/L in the groundwater sample collected from the deep monitoring well (Silverado Aquifer) during the fourth quarter 1999; TPH-cc was detected in this same well at a concentration of 690 μg/L during the second quarter 2000. Neither compound has been detected in this well since those times. The highest concentrations of total metals were for barium (0.11 mg/L) and zinc (29 mg/L). The highest concentrations of dissolved metals were also for barium (7 mg/L) and zinc (2 mg/L).

Groundwater beneath the former Temporary Drum Storage Area was sampled in the first quarter of 1999 through the second quarter of 2003 for VOCs. Groundwater in this area was also sampled for PCBs and pesticides in the first quarter of 1999; for TPH between the first quarter of 1999 and the third quarter of 2001; and for total/dissolved CAM 17 metals during the second and third quarters of 1999. PCBs and pesticides were not detected during the initial sampling event. The highest concentrations of total metals were for barium (0.1 mg/L) and zinc (0.01 mg/L). The highest concentrations of dissolved metals were also for barium (0.33 mg/L) and zinc (0.04 mg/L). Some sampling events only included the analysis of dissolved metals. TPH was

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[184] *Camp Dresser & McKee, Inc., "Final Groundwater Sampling and Analysis Plan, Playa Vista Site," June 30, 1999.*

[185] *In accordance with the Cleanup and Abatement Order No. 98-125, Playa Vista will investigate and, if necessary, remediate the groundwater to RWQCB-approved clean-up levels.*

[186] *Camp Dresser & McKee, Inc. Second Quarter 2003 Groundwater Monitoring and Progress Report, Section 10, Tables 9,10, and 11, August 15, 2003.*

not detected. With respect to VOCs, groundwater samples collected between March 1999 and the second quarter of 2003 had detectable concentrations of TCE (0.51 to 4.3 μg/L), 1,1-DCE (one-time detection of 0.6 μg/L in the third quarter of 1999), 1,1,1-TCA (one-time detection of 0.65 μg/L in the fourth quarter of 1999), and cis-1,2-DCE (0.64 to 7.8 μg/L).[187]

During the 2002 soil and groundwater investigation performed by CDM, groundwater monitoring wells were installed in other areas of potential environmental concern within the Proposed Project site, including the former Remote Test Site, the former Firing Range Area, and the former Aircraft Service Area. Although monitoring wells were not installed at the former Purged Fuel Storage Area, groundwater beneath this area was investigated during a soil and groundwater investigation performed by CDM in early 2002 (see Section IV.I, Safety/Risk of Upset, for results).[188]

Starting with the third quarter of 2002, groundwater beneath the former Remote Test Site, the former Firing Range Area, and the former Aircraft Service Area has been sampled quarterly and analyzed for VOCs. Groundwater samples beneath the former Remote Test Site had detectable concentrations of 1,1-DCA (5.1 to 8.3 μg/L), 1,1-DCE (6.3 to 9.6 μg/L), cis-1,2-DCE (34 to 55 μg/L), trans-1,2-DCE (1.6 to 2.3 μg/L), PCE (0.88 to 1.8 μg/L) and TCE (2.4 to 4.3 μg/L). Groundwater beneath the former Firing Range Area had detectable concentrations of 1,1-DCA (0.59 to 41 μg/L), 1,1-DCE (one-time detection of 9.7 μg/L in the third quarter 2002), cis-1,2-DCE (1.2 to 82 μg/L), trans-1,2-DCE (7.3 to 31 μg/L), PCE (0.66 to 0.69 μg/L), TCE (0.62 to 5.9 μg/L), and vinyl chloride (0.79 to 280 μg/L). Other VOCs, including benzene, toluene, ethylbenzene, and xylenes, have also been detected at least once in groundwater beneath the former Firing Range Area, but at low concentrations (i.e., less than 10 μg/L). Groundwater samples beneath the former Aircraft Service Area had detectable concentrations of 1,1-DCA (8.2 to 15 μg/L), cis-1,2-DCE (12 to 22 μg/L), trans-1,2-DCE (1.1 to 1.7 μg/L), and vinyl chloride (0.95 to 1.1 μg/L). [189]

During the 2002 soil and groundwater investigation, groundwater samples were analyzed primarily for VOCs and metals, although other constituents (i.e., PCBs and TPH-cc) were analyzed in a few selected samples.[190] Additional groundwater sampling was performed in early 2003 to supplement and refine the delineation of VOC-impacted groundwater within the

[187] *In accordance with the Cleanup and Abatement Order No. 98-125, Playa Vista will investigate and, if necessary, remediate the groundwater to RWQCB-approved clean-up levels.*

[188] *Camp Dresser & McKee, Inc., Soil and Groundwater Investigation Report, Phase 2 Portion of the Area D Project Area, Playa Vista Site, May 15, 2002.*

[189] *Camp Dresser & McKee, Inc., Second Quarter 2003 Groundwater Monitoring and Progress Report, Section 10, Tables 9,10, and 11, August 15, 2003.*

[190] *Camp Dresser & McKee, Inc., Soil and Groundwater Investigation Report, Phase 2 Portion of the Area D Project Area, Playa Vista Site, May 15, 2002.*

Bellflower Aquitard and Ballona Aquifer.[191] Based on the data collected during the 2002 and 2003 investigations, VOCs detected most frequently and at the highest concentration in the groundwater samples were cis-1,2-DCE, 1,1-DCA, TCE, and vinyl chloride. Cis-1,2-DCE concentrations were detected as high as 280 μg/L in the upper Bellflower Aquitard; 1,1-DCA was observed at concentrations up to 68 μg/L; TCE was detected at concentrations up to 200 μg/L; and vinyl chloride at concentrations up to 6 μg/L. In the lower Bellflower Aquitard and Ballona Aquifer, cis-1,2-DCE was detected at concentrations up to 930 μg/L; 1,1-DCA at concentrations of 70 μg/L; and vinyl chloride was detected at up to 66 μg/L. The highest cis-1,2-DCE and 1,1-DCA concentrations were detected in the Ballona Aquifer sample collected down gradient of the former Firing Range Area and the eastern portion of the former Salvage Yard Area. The highest vinyl chloride concentration was detected in the sample collected from the well located in the former Firing Range Area.

Except for one sample, all metals concentrations in the groundwater samples were below California's drinking water standard, which demonstrates that groundwater within the Proposed Project site has not been impacted by metals. Arsenic was detected in one sample, located in the former Salvage Yard Area, at a concentration of 52 μg/L, which is just slightly higher than the drinking water standard of 50 μg/L. Because this concentration is just slightly higher than the drinking water standard, which is very conservative, the detection was not considered to be of significance or environmental concern.

Since March 1999, wells located near Building 11 (within the adjacent Playa Vista First Phase Project area) have been gauged and purged of light non-aqueous phase liquid (LNAPL – a fuel hydrocarbon). At most, 2 feet of LNAPL was observed in the wells, which were manually removed from the wells on a monthly basis until July 1999, when no measurable LNAPL thickness was observed in the wells.[192] An LNAPL sheen has been observed in a few wells since November 1999; however, during the second quarter of 2003, no sheen was observed in the monitored wells.[193]

Prior to its decommissioning in June 2000, the GWTF discharged treated water to Centinela Creek under a RWQCB NPDES permit. The NPDES permit placed strict limits on the concentrations of pollutants that were acceptable for discharge and required the treated water to be monitored weekly to monthly for quality. Table 39 on pages 439 and 440 summarizes the

[191] *Camp Dresser & McKee, Inc., Soil and Groundwater Investigation Report – Phase II Addendum, Phase 2 Portion of Area D Project Area, Playa Vista Site, August 6, 2003.*

[192] *Camp Dresser & McKee, Inc., First Quarter 2000 Groundwater Monitoring and Progress Report, April 14, 2000, Section 5.*

[193] *Camp Dresser & McKee, Inc., Second Quarter 2003 Groundwater Monitoring and Progress Report, August 15, 2003.*

Table 39

GROUNDWATER REMEDIATION FACILITY DISCHARGE WATER QUALITY AND CONSTRUCTION DEWATERING DISCHARGE WATER QUALITY

			Remediation		Construction Dewatering	
Parameter	Units	EPA Method	NPDES Permit Limitation Monthly/Daily [a]	System Effluent Concentration [b]	NPDES Permit Limitation Monthly/Daily [c]	System Effluent Concentration [d]
pH	PH	150.1	6.0 – 9.0	7.05 – 7.68	6.0 – 9.0	7.37 – 8.24
Oil and Grease	mg/L	413.2	NA	ND<2.0	10/15	ND<1.0
Temperature	oF	Field	<100	73.8	<100	NA
Turbidity	NTU	180.1	50/150	ND<1.0	50/150	ND<1.0-3.5
Total Suspended Solids	mg/L	160.2	50/150	ND<10	50/150	ND<10 - 11
BOD5 20oC	mg/L	405.1	20/30	ND<2.0	20/30	ND<2.0
Sulfides (Total)	mg/L	376.2	1.0	ND< 0.1	1.0	ND<0.1
MBAS	mg/L	425.1	0.5	ND<0.10 – 0.22	0.5	0.27 – 1.1 [e]
Settleable Solids	mL/L	160.5	0.1/0.3	ND<0.1	0.1/0.3	ND<0.1
Residual Chlorine	mg/L	330.5	NA	NA	0.1	ND<0.1
Benzene	μg/L	8020	1.0	ND<0.5	1.0	ND<0.5
Toluene	μg/L	8020	150	ND<0.5	150	ND<0.5 – 0.77
Ethylbenzene	μg/L	8020	700	ND<0.5	700	ND<0.5
Total Xylenes	μg/L	8020	1,750	ND<2.0	1,750	ND<2.0 – 3.5
Ethylene Dibromide	μg/L	504	0.05	ND<0.02	0.05	ND<0.02
Carbon Tetrachloride	μg/L	8260B	NA	ND<0.5	0.5	ND<0.05
Antimony	μg/L	6020	NA	ND<2.0	NA	ND<2.0 – 3.5
Arsenic	μg/L	6020	NA	4.8	50	ND<1.0 – 52 [e]
Cadmium	μg/L	6020	NA	ND<1.0	10	ND<1.0
Chromium	μg/L	6020	NA	ND<1.0	50	ND<1.0 – 5.0
Chromium +6	μg/L	7196	NA	NA	NA	ND<8
Copper	μg/L	6020	NA	3.3	1000	ND<1.0 – 7.3
Lead	μg/L	7421	50	ND<1.0	50	ND<2.0
Mercury	μg/L	6020	NA	ND<0.2	2.0	ND<0.2
Nickel	μg/L	6020	NA	5.7	NA	ND<1.0 – 12
Selenium	μg/L	6020	NA	5.6	10	ND<1.0 – 3.5
Silver	μg/L	6020	NA	ND<1.0	50	ND<2.0
Zinc	μg/L	6020	NA	12	NA	ND<10 – 26
TPH as Gasoline	μg/L	8015M	100	ND<50	100	ND<50
1,4-Dichlorobenzene	μg/L	8260B	NA	ND<0.5	5.0	ND<0.5
1,1-Dichloroethane	μg/L	8260B	NA	ND<0.5	5.0	ND<0.5
1,2-Dichloroethane	μg/L	8260B	NA	ND<0.5	0.5	ND< 0.5
1,1-Dichloroethene	μg/L	8260B	NA	ND< 0.5	6.0	ND<0.5
1,1,1-Trichloroethane	μg/L	8260B	NA	NA	NA	ND<0.5 – 0.69
Chloroform	μg/L	8260B	NA	NA	NA	ND<0.5 – 1.1
Dichloromethane	μg/L	8260B	NA	NA	NA	ND<2
Trichloroethylene	μg/L	8260B	NA	ND<0.5	5	ND<0.5
Tetrachloroethylene	μg/L	8260B	NA	ND<0.5	5	ND<0.5
Vinyl Chloride	μg/L	8260B	NA	ND<0.5	0.5	ND<0.5

Table 39 (Continued)

GROUNDWATER REMEDIATION FACILITY DISCHARGE WATER QUALITY AND CONSTRUCTION DEWATERING DISCHARGE WATER QUALITY

			Remediation		Construction Dewatering	
Parameter	**Units**	**EPA Method**	**NPDES Permit Limitation Monthly/Daily [a]**	**System Effluent Concentration [b]**	**NPDES Permit Limitation Monthly/Daily [c]**	**System Effluent Concentration [d]**
Methyl-tert-butyl-ether	µg/L	8260	35	ND<0.5	35	ND<0.5 – 4.0
Phenols	mg/L	420.1	1.0	ND<0.1	1.0	ND<0.1
Chlorinated Phenols	µg/L	8270	NA	NA	1.0	ND [f]

NA = not applicable
mg/L = milligrams per liter *µg/L = micrograms per liter*
D< = not detected at method detection limits
J = Estimated concentrations – detected at a concentration below laboratory reporting limit
NPDES = National Pollutant Discharge Elimination System
EPA Method = United States Environmental Protection Agency specifications for sampling and laboratory testing

[a] *RWQCB NPDES Permit #CAG834001.*
[b] *Based on monitoring results from 2002 Annual Report, February 2003.*
[c] *RWQCB NPDES Permit #CAG994002.*
[d] *Based on monitoring results from 2002 Annual Report, February 2003.*
[e] *One time exceedance; water was re-treated and tested three times for compliance prior to discharge.*
[f] *Laboratory reporting limits vary by compound.*

Source: Camp Dresser & McKee Inc.

permitted and detected effluent concentrations from remediation activities and construction dewatering. As of March 2000, the total volume of groundwater treated and discharged was approximately 94 million gallons.[194] Prior to discharge, the treated groundwater was sampled and analyzed to ensure it met the effluent limit concentrations specified in the permit. Whenever treated groundwater contained pollutants at concentrations exceeding the permit requirements, the water was not discharged until the source of the exceedance was identified and corrective action implemented.

See Subsection 2.2.3.2.1 in Section IV.I, Safety/Risk of Upset, for a discussion of the assessment and remediation of soil and groundwater contamination associated with the former Howard Hughes Company Plant activity areas within the Proposed Project site.

[194] *Camp Dresser & McKee, Inc., First Quarter 2000 Groundwater Monitoring and Progress Report, April 14, 2000, Section 5.*

3.0 IMPACT ANALYSIS

The potential impacts to water quality due to the construction activities and final buildout conditions of the Proposed Project are addressed in this subsection. Impacts to surface water quality (Subsection 3.1) are addressed separately from the impacts to groundwater quality (Subsection 3.2). Each subsection outlines the methodology used for assessing impacts, the significance thresholds used as a measure of potential significant impacts to water quality, the Project Design Features specifically designed for water quality improvements, and then an assessment of the potential impacts to water quality.

3.1 Methodology

3.1.1 Surface Water Quality

Impacts to the surface water quality of the primary waterbodies of concern in the vicinity of the Proposed Project are discussed below. The assessment of the Freshwater Marsh has considered that the Marsh includes several distinct components, including the primary management areas with enhanced natural treatment capacity and the main body. The primary management areas were specifically designed to serve as the primary natural treatment areas of the Freshwater Marsh. The analyses of potential effects of the Proposed Project have focused on the quality of the water that would enter the main body of the Marsh after the primary management area. The primary waterbodies of concern for this project include those that receive direct runoff from the project areas, the Freshwater Wetlands System (Riparian Corridor/Freshwater Marsh), the Ballona Wetlands, and the Ballona Channel. Potential impacts to these waterbodies will be quantitatively assessed using the results of a pollutant loading model. The modeled parameters include: TSS, total phosphorus, total Kjeldahl nitrogen (TKN), oil and grease, and total and dissolved copper, lead, and zinc. These parameters were chosen for two primary reasons: (1) the parameters represent typical pollutants found in urban runoff (and would thus be representative of the water quality from the Proposed Project); and (2) sufficient data were available for these parameters to facilitate land use-based modeling of stormwater runoff and effluent quality predictions from stormwater BMPs; thus the modeled pollutants are expected to be a reliable indicator of water quality. Certain metals were not selected for the model as they are not likely to be present in urban runoff at levels of concern. In order to provide a more complete and meaningful analysis of water quality impacts associated with the Proposed Project and to evaluate the adequacy of the Freshwater Wetlands System to accommodate both adjacent Playa Vista First Phase Project and the Proposed Project flows, the pollutant loads from the pre-First Phase conditions have been compared to the pollutant loads estimated to occur at the completion of the adjacent Playa Vista First Phase Project and at the completion of the Proposed Project (buildout) through the use of a pollutant loading model. Table 40, Table 41, and Table 42 on pages 442, 443, and 445, respectively summarize the land use acreages used in the pollutant loading model for the Proposed Project, adjacent Playa Vista

Table 40

LAND USE BY DRAINAGE SYSTEM PRE-FIRST PHASE
(acres)

Drainage System	Industrial	Commercial/ Residential	Commercial [a]	Major Roadways [b]	Open Water [c]	High Density Residential	Low Density Residential	Open Space	Total [d]
Playa Vista Tributary									
Centinela Ditch									
Proposed Project			16		1			55	72
First Phase			81		5			120	206
Off-site			88	2			154	48	292
Jefferson Storm Drain [e]									
Proposed Project								38	38
First Phase								94	94
Off-site	65		12	37		9	93	47	263
Lincoln Storm Drain South									
First Phase									
Off-site			4	5		7	74	1	91
Freshwater Marsh [f] (First Phase)								32	32
Total [d]	65	0	201	44	6	16	321	435	1,088
Ballona Wetlands Tributary									
Ballona Wetlands			10	16	6	11	160	264	467
Total [d]	0	0	10	16	6	11	160	264	467
Total Acreage of Tributary Areas	65	0	211	60	12	27	481	699	1,555

[a] *The 16 and 81 acres within the Proposed Project and First Phase Project areas, respectively, that are tributary to the Centinela Ditch Drainage System, are the former Hughes Aircraft Company plant buildings used for commercial purposes.*
[b] *Major Roadways include Jefferson Blvd., Lincoln Blvd., Culver Blvd., and Centinela Ave.*
[c] *Open Water acreages represent the Centinela Ditch.*
[d] *Acreages are adjusted to account for rounding.*
[e] *In pre-First Phase, the Jefferson Storm Drain outlet is located near the Culver/Jefferson intersection and receives a portion of the runoff from the area near the Culver/Jefferson Boulevard intersection, west of Lincoln Boulevard, and then discharges directly to the Ballona Wetlands.*
[f] *In pre-First Phase, the Freshwater Marsh has not been constructed.*

Source: Camp Dresser & McKee Inc.

Table 41

LAND USE BY DRAINAGE SYSTEM WITH PLAYA VISTA FIRST PHASE (acres)

Drainage System	Industrial	Commercial/ Residential	Commercial [a]	Major Roadways [b]	Open Water [c]	High Density Residential	Low Density Residential	Open Space	Total [d]
Playa Vista Tributary									
Riparian Corridor									
Proposed Project			16		1			55	72
First Phase			87		14	30		26	157
Off-site			87				154	47	289
Central Storm Drain									
Proposed Project								37	37
First Phase			38			58		13	109
Off-site				8					8
Jefferson Storm Drain									
Proposed Project								1	1
First Phase			15			18		2	35
Off-site	65		12	41		9	93	1	221
Lincoln Storm Drain South									
First Phase									
Off-site			4	6		7	74		91
Freshwater Marsh									
First Phase					10			22	32
Total [d]	**65**	**0**	**259**	**56**	**25**	**122**	**321**	**204**	**1,052**

Table 41 (Continued)

LAND USE BY DRAINAGE SYSTEM WITH PLAYA VISTA FIRST PHASE (acres)

Drainage System	Industrial	Commercial/ Residential	Commercial [a]	Major Roadways [b]	Open Water [c]	High Density Residential	Low Density Residential	Open Space	Total [d]
Ballona Wetlands Tributary									
Ballona Wetlands [f]			10	20 [e]	5	11	161	296 [f]	503
Total [d]	**0**	**0**	**10**	**20** [e]	**5**	**11**	**161**	**296**	**503**
Total Acreage of Tributary Areas	**65**	**0**	**269**	**76**	**30**	**133**	**482**	**500**	**1,555**

[a] *The 16 acres within the Proposed Project area and 81 of the 87 acres within the First Phase Project area are the former Hughes Aircraft Company plant buildings used for commercial purposes.*

[b] *Major Roadways include Jefferson Blvd., Lincoln Blvd., Culver Blvd., and Centinela Ave.*

[c] *Open Water acreages represent the Centinela Ditch.*

[d] *Acreages are adjusted to account for rounding.*

[e] *Increase in acreage from Table 40 is due to the widening of Lincoln Boulevard.*

[f] *Increase in acreage from Table 40 is due to a portion of the runoff from the area near the Culver/Jefferson Boulevard intersection, west of Lincoln Boulevard, which discharges to the Jefferson Storm Drain prior to discharging to the Ballona Wetlands in pre-First Phase.*

Source: Camp Dresser & McKee Inc.

Table 42

**LAND USE BY DRAINAGE SYSTEM
WITH PLAYA VISTA FIRST PHASE AND PROPOSED PROJECT (acres)**

Drainage System	Industrial	Commercial/ Residential	Commercial	Major Roadways [a]	Open Water	High Density Residential	Low Density Residential	Open Space	Total [b]
Playa Vista Tributary									
Riparian Corridor									
Proposed Project		8			4	17		14	43
First Phase			87		14	30		26	157
Off-site			87	1			154	47	289
Central Storm Drain									
Proposed Project		15				47		4	66
First Phase			38			58		13	109
Off-site				8					8
Jefferson Storm Drain									
Proposed Project						1			1
First Phase			15			18		2	35
Off-site	65		12	41		9	93	1	221
Lincoln Storm Drain South									
First Phase									
Off-site			4	6		7	74		91
Freshwater Marsh									
First Phase					10			22	32
Total [b]	**65**	**23**	**243**	**56**	**28**	**187**	**321**	**129**	**1,052**
Ballona Wetlands Tributary									
Ballona Wetlands [d]			10	20 [c]	5	11	161	296 [d]	503
Total [b]	**0**	**0**	**10**	**20 [c]**	**5**	**11**	**161**	**296**	**503**
Total Acreage of Tributary Areas	**65**	**23**	**253**	**76**	**33**	**198**	**482**	**425**	**1,555**

[a] *Major Roadways include Jefferson Blvd., Lincoln Blvd., Culver Blvd., and Centinela Ave.*

[b] *Acreages are adjusted to account for rounding.*

[c] *Increase in acreage from Table 40 is due to the widening of Lincoln Boulevard.*

[d] *Increase in acreage from Table 40 is due a portion of the runoff from the area near the Culver/Jefferson Boulevard intersection, west of Lincoln Boulevard, which discharges to the Jefferson Storm Drain prior to discharging to the Ballona Wetlands in pre-First Phase.*

Source: Camp Dresser & McKee Inc.

First Phase Project, and off-site tributary areas under pre-First Phase, with Playa Vista First Phase, and with Playa Vista First Phase and Proposed Project conditions. Table 43 on page 448 compares the overall land uses amongst the three scenarios analyzed. Qualitative impact assessments of the primary waterbodies of concern and of the final receiving waters, the Santa Monica Bay, will also be included in this subsection. Key elements of the water quality impacts analysis include:

1. assessing how the Proposed Project design meets or exceeds applicable local stormwater treatment system and source control requirements;
2. providing a detailed analysis of the project goal to achieve a no net-increase, compared to pre-First Phase conditions, in pollution from parameters of concern;
3. comparing predicted effluent quality of Proposed Project stormwater discharges to numerical water quality benchmarks and narrative water quality criteria and objectives;
4. assessing how the project addresses parameters that are considered water quality limited in the receiving waters (i.e., impaired waterbodies);
5. evaluating dry-weather (nuisance) water quality; and
6. estimating whether substantial erosion, sedimentation, or channel instability would result from the Proposed Project.

By the nature of these elements of analysis, some are quantitative (numerical) and some are qualitative (narrative). Numerically based impacts have been assessed primarily using the pollutant-loading model. Narratively based impacts have been assessed by qualitatively discussing Project Design Features, and the properties of the water quality parameters and pollutants of concern.

The following paragraphs briefly describe the impact assessment methodology for the Proposed Project. For a detailed description of the methodology refer to Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1).

3.1.1.1 Local Design Requirements (MS4 Permit)

As part of the Los Angeles County Municipal Stormwater NPDES Program (MS4 Permit), the County's "Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP)" details the requirements for new development and significant redevelopment BMPs. The SUSMP requires that new developments (such as the Proposed Project) employ a variety of measures, including, as applicable, treatment and source controls to reduce the discharge of

Table 43

TOTAL LAND USES TRIBUTARY TO BALLONA WETLANDS FOR EVALUATED LAND USE SCENARIOS (acres)

	Total Acreage of Tributary Areas								
Land Use Scenario	Industrial	Commercial/ Residential	Commercial	Major Roadways [a]	Open Water	High Density Residential	Low Density Residential	Open Space	Total [b]
Pre-First Phase	65	0	211	60	12	27	481	699	1,555
With Playa Vista First Phase	65	0	269	76	30	134	482	499	1,555
With Playa Vista First Phase and Proposed Project	65	23	253	76	33	198	482	425	1,555

[a] *Major Roadways include Jefferson Blvd., Lincoln Blvd., Culver Blvd., and Centinela Ave.*
[b] *Acreages are adjusted to account for rounding.*

Source: Camp Dresser & McKee Inc.

pollutants from stormwater conveyance systems. In addition, the MS4 Permit requires proof of ongoing treatment control BMP maintenance (as described in the SUSMP), including a signed statement from the developer accepting responsibility for BMP maintenance until the time of property transfer, at which time a signed agreement from a public entity, or property recipient, assuming responsibility for the maintenance would be required. For purposes of this impact analysis, the Project Design Features, including BMP maintenance agreements of the Proposed Project are compared to the SUSMP requirements. By showing that the Proposed Project would meet the SUSMP requirements, the standards of Section 402(p) of the CWA would also be met.

3.1.1.2 Antidegradation Policy

The State's Antidegradation Policy restricts degradation of surface and ground waters of the State. Based on the water quality performance of the Propose Project, if pollutant loads or concentrations from the project are such that beneficial uses in the receiving waters are maintained either through decreased loads or decreased concentrations of pollutants or both, then the Antidegradation Policy would be met, as there would be no degradation in the receiving waters compared with pre-project conditions. To this end, the pollutants that are typical of urban runoff were predicted for the Proposed Project and compared to predicted pre-First Phase concentrations and loads of the regulated receiving waterbodies (Ballona Wetlands and the Ballona Creek Estuary).

3.1.1.3 Comparison of Predicted Effluent Quality to Water Quality Benchmarks

Water quality benchmarks are used in this EIR to assess the water quality of the Project and the surrounding waterbodies. The term "benchmark" is used as a catchall phrase to represent the applicable regulatory water quality standards and objectives, as well as non-regulatory water quality objectives and guidelines. In some cases, water quality standards for a waterbody are used as water quality benchmarks for a different waterbody because applicable water quality standards are not available. For example, the COP water quality standard for total suspended solids, which is only a regulatory standard for ocean waters, was used as a water quality benchmark for the Proposed Project because there is no applicable numerical water quality standard for total suspended solids. There are narrative water quality objectives for total suspended solids (TSS) and numerical water quality objectives for turbidity listed in the Basin Plan. Theses objectives, which apply to all inland surface waters, including wetlands, are discussed and addressed below in Subsection 3.4.2.2.

The modeled parameters used for the comparison include: TSS, total phosphorus, total Kjeldahl nitrogen (TKN), oil and grease, and total and dissolved copper, lead, and zinc. To assess potential impacts of metals, the CTR criteria for the protection of aquatic life are used for comparison to predicted metals concentrations.[195] The acute CTR criteria are considered the most relevant criteria for comparison to modeled stormwater quality due to the infrequent nature of storm events in southern California and the fact that most storm events last for less than 4 days, which is the averaging period for which the chronic CTR apply (note that the maximum storm recorded at the Los Angeles International Airport rain gage from 1949-1997 is 4.2 days; average is 12 hours).[196]

The EPA Nutrient Guidelines are used to assess how the total phosphorus and TKN concentrations predicted in the stormwater runoff from the Proposed Project compare to the nutrient levels that are protective of aquatic life and recreational uses designated for the Proposed Project's receiving waterbodies.[197] To assess potential impacts of oil and grease and TSS, the COP discharge limitations are compared to predicted oil and grease and TSS concentrations.[198] The Nutrient Guidelines and the COP discharge limitations are selected as numerical water quality reference levels for comparative purposes only, to assess potential impacts of the modeled water quality parameters. Refer to Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1) for the discussion and derivation of the numerical water quality reference levels.

To assess potential impacts with respect to applicable non-numerical water quality objectives, narrative objectives in the Basin Plan were compared to Project Design Features and proposed source control programs of the Proposed Project. Pursuant to Section 13050 of the CWC, stormwater runoff from the Proposed Project must not create pollution, contamination or nuisance. Since the water quality objectives in the Basin Plan are intended to protect designated beneficial uses (which includes the human contact recreation (REC1) designated use for the Ballona Wetlands and Ballona Creek Estuary), the potential for pollution or contamination, as defined in the CWC, has been addressed by comparing the Basin Plan objectives to Project Design Features. In addition, several of the narrative objectives in the Basin Plan specifically address water quality parameters that are used to indicate "nuisance" conditions, such as biostimulatory substances, color, exotic vegetation, floating material, oil and grease, solid, suspended, or settleable materials, and taste and odor. Therefore, the comparison of Basin Plan objectives also addresses the potential significant impact caused by creating a condition of nuisance.

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195 *The CTR criteria are water quality standards legally applicable to selected waters with human health or aquatic life designations, such as the Ballona Channel and the Ballona Wetlands; however, in reference to the Freshwater Wetlands System components, the CTR criteria are used as numerical water quality reference levels for comparative purposes only.*

196 *Strecker, E. and Howell, J., 1998. Playa Vista Stormwater Rainfall Analysis. Memo to Playa Vista EIR Team.*

197 *USEPA, 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion III. EPA 822-B-00-016.*

198 *SWRCB, 2001. California Ocean Plan: Water Quality Control Plan Ocean Waters of California.*

3.1.1.4 Assessment of Impaired Waterbody Identified Parameters

The Proposed Project discharges directly to the Ballona Creek Estuary and Ballona Wetlands (via the Freshwater Marsh, but infrequently and only during storm events). Both waterbodies are listed under Section 303(d) by the State of California as being impaired (i.e., unsupportive of at least one current or potential designated beneficial use). To assess the potential impacts of the Proposed Project relevant to water quality-limiting pollutants, constituents associated with new urban development were identified. Some constituents (such as copper, lead and zinc) were quantitatively assessed while others (such as trash and pesticides), due to a lack of sufficient urban runoff data, were addressed qualitatively.

3.1.1.5 Dry-Weather Water Quality

Stormwater drainage systems in Southern California have received increasing attention regarding the impacts of dry-weather flows and several local and regional jurisdictions have chosen to divert portions of their dry-weather flows to sanitary systems for treatment. Dry-weather flows are generally regarded as nuisance flows due to their potential effect on human health.[199] This analysis qualitatively assesses the potential effects of these dry-weather flows from the Proposed Project based upon data collected to date and potential options for their management. This analysis will address the nuisance portion of Section 13050 of the CWC with respect to dry-weather periods, and the receiving water limitations in the MS4 Permit (which states that non-stormwater discharges from the MS4 shall not cause or contribute to a condition of nuisance), as well as the proposed and potential future dry-weather TMDLs for bacteria at the Santa Monica Bay Beaches and the Ballona Creek Estuary, respectively. In addition, the CTR water quality criteria will be discussed with respect to potential dry-weather flows from the Proposed Project site.

3.1.1.6 Erosion, Sedimentation, and Channel Stability

Urban development is considered a hydromodification activity as it is a potential cause of in-stream channel erosion and habitat destruction. By design, the Freshwater Wetlands System reduces total urban runoff volume and peak flow rates to the Ballona Wetlands. Therefore, the two channels with the most potential to be impacted by discharge of stormwater would be the Centinela Ditch (to be fully replaced by the Riparian Corridor), a man-made and partially unlined facility, and the estuary portion of the Ballona Channel, which is composed of grouted riprap slopes and an earthen bottom downstream of Centinela Boulevard. Potential impacts are assessed quantitatively in Section IV.C.(1), Hydrology, and qualitatively in this section by discussing the potential of the Proposed Project to meet the requirements of the applicable MS4

[199] *See Section 3.2.1 for definition of "nuisance."*

Permit (in particular, SUSMP Standards), and Basin Plan, while not creating a condition of nuisance as defined in Section 13050 of the CWC.

3.1.2 Groundwater Quality

Short-term groundwater quality impacts could potentially occur during construction of the Proposed Project as a result of soil or shallow groundwater being exposed to construction materials, wastes, and spilled materials or as a result of construction dewatering. These potential impacts are qualitatively assessed.

Long-term (operational) groundwater quality impacts associated with the Proposed Project could potentially occur due to permanent dewatering of underground parking structures and/or groundwater remediation activities. These potential impacts are qualitatively assessed.

The potential for the Proposed Project to result in groundwater contamination, modification of existing contaminant movement, or expansion of the contaminated area is analyzed in Section IV.I, Safety/Risk of Upset.

3.2 Significance Thresholds

3.2.1 Surface Water Quality

The Draft Los Angeles CEQA Thresholds Guide (p. D.2-4) states that a project would normally have a significant impact on surface water quality if discharges associated with the Proposed Project would:

- Create "pollution," "contamination" or "nuisance" as defined in Section 13050 of the California Water Code. These definitions are:
  - Pollution means an alteration of the quality of the waters of the state to a degree, which unreasonably affects either of the following: (1) the waters for beneficial uses;[200] or (2) facilities which serve these beneficial uses. Pollution may include Contamination.

[200] *Section 13050 provides the following definition for beneficial uses – "'Beneficial uses' of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves." Beneficial uses have been designated by the RWQCB for the Ballona Wetlands and the Ballona Channel, but not for the Freshwater Wetlands System.*

- Contamination means an impairment of the quality of the waters of the state by waste[201] to a degree which creates a hazard to the public health through poisoning or through the spread of disease. Contamination includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

- Nuisance means anything which meets all of the following requirements: (1) is injurious to health, or is indecent or offensive to the senses or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) affects at the same time an entire community of neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and (3) occurs during, or as a result of, the treatment or disposal of wastes.

- Cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan (Basin Plan) for the receiving waterbody.

These thresholds are applicable to the Proposed Project and were used to determine if the Project would have significant surface water quality impacts.

3.2.2 Groundwater Quality

The Draft Los Angeles CEQA Thresholds Guide (p. D.4-4) states that a project would normally result in a significant impact on groundwater quality if it would:

- Affect the rate or change the direction of movement of existing contaminants;

- Expand the area affected by contaminants;

- Result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion); or

- Cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act.

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[201] *Section 13050 provides the following definition for waste – "'Waste' includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."*

These thresholds are applicable to the Proposed Project and as such are used to determine if the Project would have significant groundwater quality impacts.

3.3 Project Design Features

3.3.1 Surface Water Quality

The design of the Proposed Project incorporates a number of pollutant source control and water quality features. Source controls include such features as underground parking (approximately 75 percent of the buildings within the Proposed Project would be designed with subterranean/underground parking), covered trash and recycling facilities, a street and catch basin cleaning program, xeriscape and native landscaping to reduce water use, a fertilizer and pesticide management program, prohibition of certain building materials such as roofing/gutter materials that are high in copper and zinc, and a tenant/resident education program. Additionally, the Proposed Project will include the use of roof drain biofiltration systems for all buildings, additional water quality inlets (BMP catch basins) for catch basins on the Central Storm Drain, and a bioswale within a park to receive and filter stormwater runoff from the Proposed Project prior to entering the Riparian Corridor. Major water quality features within the adjacent Playa Vista First Phase Project and the Proposed Project that contribute to pollutant removal through treatment of collected storm runoff include the biofiltration aspects of the Freshwater Wetlands System, water quality inlets (BMP catch basins), and other measures described in more detail below. The water quality management features have been designed to achieve specific water quality goals and benefits at buildout of Playa Vista, including the adjacent Playa Vista First Phase Project and the Proposed Project, as compared to pre-Playa Vista conditions. The Proposed Project has been designed to achieve, in conjunction with the adjacent Playa Vista First Phase Project, no net increase in pollution to receiving waters at Project buildout, compared to pre-First Phase conditions, as well as to meet or exceed water quality design standards for BMPs. Figure 33 on page 455 provides an overview of the planned BMPs for the Proposed Project. See Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1) for information detailing the percent of flows to each BMP and the effluent concentrations assumed for these BMPs in the pollutant loading model.

3.3.1.1 Freshwater Wetlands System

The Freshwater Wetlands System (comprised of the Riparian Corridor and Freshwater Marsh) is a Project Design Feature, the majority of which was approved under the adjacent Playa Vista First Phase Project (the central portion of the Riparian Corridor is proposed as part of the Proposed Project) serving as a comprehensive system intended to manage and accommodate the hydrology (stormwater flows) and water quality requirements of the adjacent Playa Vista First Phase Project and the Proposed Project as well as off-site tributary areas, while providing habitat enhancement in the area. When granting their approvals for the Freshwater Wetlands System,

Figure 33 Best Management Practices (BMPs)

the USACE, SWRCB, RWQCB, and CCC acknowledged the primary functions of the Freshwater Wetlands System as:

- Cleansing urban runoff from the adjacent Playa Vista First Phase Project and the Proposed Project as well as hundreds of acres outside of the adjacent Playa Vista First Phase Project and the Proposed Project areas;
- Providing flood control protection for future buildout of that portion of the adjacent Playa Vista First Phase Project and the Proposed Project located south of Ballona Channel; and
- Providing new and enhanced freshwater habitat.[202]

The agencies' approvals (404 Permit, 401 Certification, CCC Certification, and CDP) recognized the degraded nature of the pre-existing habitat in the area and the fact that urban runoff from existing development has been a contributor to that degradation, and also recognized the potential of the Freshwater Wetlands System to treat the urban runoff and increase habitat values while providing necessary flood control facilities for the adjacent Playa Vista First Phase Project and the Proposed Project. The effect of the Freshwater Wetlands System was to better manage (i.e., reduce) the amount of freshwater flowing to the Ballona Wetlands salt marsh, and to enhance the quality of dry-weather and stormwater runoff into the Ballona Channel and Santa Monica Bay such that pollutant loadings discharged to the Wetlands, Channel and ultimately the Bay are reduced after full buildout of the adjacent Playa Vista First Phase Project and the Proposed Project when compared to pre-First Phase conditions without the Freshwater Wetlands System. These water quality benefits to the Ballona Wetlands, Ballona Channel, and Santa Monica Bay were specifically contemplated and intended in the design of the Freshwater Wetlands System and the overall Playa Vista Project. In addition, the Freshwater Wetlands System is also designed to provide significant freshwater wetland and riparian habitat values, with the water supply and water quality aspects of the System ensuring that the system is supplied with enough water of sufficient quality to sustain the habitat.

Since large portions of the Freshwater Wetlands System have already been constructed or are under construction as part of the adjacent Playa Vista First Phase Project, the First Phase has provided "excess mitigation" from a hydrology and water quality perspective. With the subsequent phased construction of the Proposed Project, the Freshwater Wetlands System would still provide "over-treatment" of the runoff from the adjacent Playa Vista First Phase Project and the Proposed Project (i.e., the nature and extent of surface water quality treatment offered by the Freshwater Wetlands System would exceed the amount necessary to adequately serve the

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[202] *U.S. Army Corps of Engineers Environmental Assessment 404(b)(1) Evaluation Public Interest Review, Permit Application No. 90-426-EV, at5-6 (1992).*

adjacent Playa Vista First Phase Project and the Proposed Project within their drainage systems) due to its volume of runoff capture vs. SUSMP requirements, as well as the fact that it treats significant off-site surface water to both the adjacent Playa Vista First Phase Project and the Proposed Project areas. In order to provide a more complete and meaningful analysis of water quality impacts associated with the Proposed Project and to evaluate the adequacy of the Freshwater Wetlands System to accommodate both adjacent Playa Vista First Phase Project and the Proposed Project flows, the pollutant loads from the pre-First Phase conditions have been compared to the pollutant loads estimated to occur at the completion of the adjacent Playa Vista First Phase Project and at the completion of the Proposed Project (buildout) through the use of a pollutant loading model.

The full Freshwater Wetlands System will consist of a Riparian Corridor and three primary management (enhanced natural treatment) areas at the openings of three outlet areas (Riparian Corridor/Lincoln Storm Drain South, Jefferson Storm Drain, and Central Storm Drain), as well as the larger Freshwater Marsh itself. Runoff quality would be passively improved as runoff flows through the Riparian Corridor, the primary management areas, and then the Freshwater Marsh by a number of natural physical and bio-chemical processes. The size of the system would allow dry-weather and most stormwater runoff to flow through at low velocities, thereby permitting the sedimentation and other removal processes of particulate matter and dissolved constituents through adsorption occurring mostly in the primary management areas and then in the rest of the Marsh. The natural systems in the wetland, including plantings of native vegetation, would slow velocities and facilitate the natural processes of adsorption, filtration, plant uptake, and biological degradation of dissolved constituents.

The natural functions of the Freshwater Wetlands System and the related hydrologic controls it allows, will decrease significantly pollutant loading to the adjacent Ballona Wetlands. The system manages freshwater input to the Ballona Wetlands by allowing the runoff from the adjacent Playa Vista First Phase Project and the Proposed Project and off-site areas, which flow through the adjacent Playa Vista First Phase Project and the Proposed Project sites under low-flow and up to approximately one-year design storm conditions (approximately 92 percent of the total flows anticipated to occur annually), to be diverted directly to the Ballona Channel.[203, 204] Freshwater flows greater than one-year-storm conditions (approximately 8 percent of the total annual flows) would experience similar or smaller (depending on the magnitude of the storm) contaminant removals in the Freshwater Wetlands System prior to being introduced to the Ballona Wetlands. Therefore, pollutant loads to the Ballona Wetlands will be reduced substantially by both actual redirection of stormwater away from the Ballona Wetlands, as well

[203] *Woodward-Clyde, Playa Vista Stormwater Rainfall Analysis, Memorandum, November 3, 1998.*

[204] *The Freshwater Marsh is designed to accommodate/divert approximately 92 percent of the total annual flows; however, through the use of adjustable weirs and other design features, it can be operated in a manner that diverts a lesser amount of flows should there be a desire to route more water to the Ballona Wetlands.*

as by improved water quality of those flows that do reach the Wetlands from the Freshwater Marsh.

3.3.1.2 Other Measures to Reduce Pollutant Loadings

Similar to the provisions of the adjacent Playa Vista First Phase Project, the Proposed Project includes the installation of water quality inlets, enhanced street/catch basin cleaning, a tenant/resident education program, household hazardous waste collection, storm drain signage, landscape irrigation controls, covered trash and recycling facilities, underground parking (in most areas) and vehicle use impact reduction measures, to reduce pollutant loadings. In addition, the Proposed Project includes the use of roof drain biofiltration systems to receive and filter runoff from all buildings within the Project site. Another pollutant reduction measure to be implemented as part of the Proposed Project is a vegetated swale within a park adjacent to the Riparian Corridor. This vegetated swale will receive and filter stormwater runoff from the Proposed Project prior to entering the Riparian Corridor.

The water quality control measures proposed as part of the Project are consistent with the types of water quality management measures recommended in the plan for California's Non-Point Source (NPS) Pollution Control Program developed by the SWRCB and the CCC.[205] Of NPS Program's six (6) management measure categories, the following are relevant to the Proposed Project: Urban; Hydromodification Activities (e.g., channelization); and Wetlands and Riparian Areas. For details on the plan's management measure categories, see Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1). Consistent with the recommended Urban Management Measures, the Proposed Project incorporates water quality control measures that include watershed protection and site development design features (i.e., BMPs and source controls, etc.). The Proposed Project also includes construction-related water quality control measures, treatment of runoff from existing development (off-site catch basins), and public education measures.

The construction of the Riparian Corridor incorporates erosion control measures into the grading (i.e., gentle slopes) and landscaping (i.e., vegetated channel and banks) that are consistent with the recommended management measures of the NPS Program for hydromodification. Via diversion of most storm flows to the Ballona Channel, the Freshwater Marsh reduces existing hydromodification impacts on the Ballona Wetlands due to past urbanization.

The Riparian Corridor, in the adjacent Playa Vista First Phase Project and the Proposed Project, is consistent with the NPS Program's recommended wetlands/riparian protection and

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[205] *http:\\ceres.ca.gov\coastalcomm\nps\npsndx.html.*

restoration management measures for Wetlands and Riparian Areas. Also, the proposed use of vegetated treatment systems such as vegetated swales is consistent with the vegetated treatment systems management measure.

The Proposed Project would be responsive to the Ballona Creek and Wetlands trash total maximum daily loads (TMDL), through the implementation of Project Design Features and BMPs, such as enhanced street/catch basin cleaning, an education program, storm drain signage, vegetated swales, trash racks and controls within the Freshwater Wetlands System. These Project Design Features and BMPs, which in several cases also include treatment of off-site runoff, are designed to prevent trash from being discharged into the Ballona Channel and Ballona Wetlands. The Freshwater Marsh is designed to capture in excess of the 1-year storm event. In addition, with the catch basin inserts and the three primary management areas of the Marsh, and implementation of scheduled maintenance, the Freshwater Wetlands System, as a whole, is designed to remove particles much smaller than 5 millimeters without clogging.

3.3.2 Groundwater Quality

A number of surface water quality Project Design Features have been designed to reduce the potential for pollutants associated with both construction (such as construction BMPs) and operation (such as the Freshwater Wetlands System). To the extent that there is any incidental groundwater recharge from runoff flowing over or detained in pervious surfaces on the Proposed Project, the potential for groundwater quality impacts would be reduced as a result of the measures designed to reduce pollutants in surface runoff. There is the potential to concentrate sediment in the bottom of the Freshwater Wetlands System, which could be transmitted through infiltration into the groundwater. However, the Freshwater Wetlands System has been designed to reduce pollutants, and thus sediments, in surface water. The anaerobic conditions and associated bacterial populations that are expected in the wetland soils of the Riparian Corridor and the Freshwater Marsh will reduce many metals to insoluble forms that are less toxic and less bioavailable. As part of the Freshwater Wetlands System's Operations, Maintenance and Monitoring Manual (O&M Manual), monitoring and maintenance (e.g., vegetation and sediment removal) would be performed as prescribed in the O&M Manual (see Appendix F-2 for details) to ensure that quality of the sediment accumulated remains below levels of concerns associated with metals, pesticides, and other toxic chemical as they relate to potential bioaccumulatory and toxicity impacts. In addition, the aquifers (Ballona and Silverado) underlying the site are separated from the surface with an aquitard (Bellflower). The Bellflower Aquitard acts like a barrier, slowing the hydraulic communication between the surface and the Ballona and Silverado Aquifers, thus limiting the impact of these deeper water producing units. To further limit migration of pollutant through infiltration, the Riparian Corridor portion of the Freshwater Wetlands System has been designed with a clay liner to limit flow from the surface water to the groundwater.

No land uses (e.g., industrial land uses) are planned that could legally contribute to groundwater contamination within the Proposed Project site. The design, construction and operation of any land uses that might include storage of fuel in underground tanks (such as retail gas stations), would be regulated by current state law that provides for methods which monitor and minimize the potential for leakage.

Not all structures within the Proposed Project site would be above the groundwater table. Some structures may extend into the groundwater table (e.g., two-level subterranean parking garages), and those structures would require permanent dewatering systems. The proposed permanent dewatering systems, which include dewatering for the methane safety system and dewatering of structures below the groundwater table, is a "contingent" system that would operate only if/as groundwater elevations occur at the level of the dewatering pipes. In case groundwater is present or in future rises to an elevation above the elevation of the groundwater pipes, the system is designed to convey the water to a sump where it is removed by automatic pumps. Generally, the dewatering system does not include dewatering by pumping from deep wells or any specific well points (see Appendix D-6). However, some dewatering may be necessary in connection with periodic methane system maintenance. Any necessary groundwater dewatering would be conducted in accordance with the NPDES or other applicable regulatory requirements.

3.4 Project Impacts

3.4.1 Surface Water Quality

Because the Habitat Creation/Restoration Component would not involve the construction of impervious surfaces, the land use of the area for the Habitat Creation/Restoration Component would not change, and minimal amounts of surface water runoff would be generated, compared with existing conditions. In addition, implementation of the Habitat Creation/Restoration Component would involve the construction of a major stormwater management facility, the completion of the Riparian Corridor, which was designed to serve the Proposed Project by conveying increases in peak runoff rates or volumes caused by the construction of portions of the Urban Development Component as well as provide water quality benefits through natural processes (e.g., sedimentation, biofiltration, bacterial reduction and decomposition, and plant uptake) for such runoff from the Urban Development Component. Because the Habitat Creation/Restoration Component will not have adverse impacts on surface water quality, the impacts discussion for the Proposed Project in this section focuses on surface water quality impacts of the Urban Development Component.

For the purposes of this analysis, the following regulatory standards are considered, as appropriate:

1. NPDES Stormwater Permit Requirements including:

   - The control and management of discharges from storm drains of pollutants to surface water, as required by Section 402(p) of the CWA. This is accomplished through SUSMP requirements (in the MS4 Permit) for new development projects, including structural or treatment control BMP maintenance agreements.

   - Construction Permit.

   - Dewatering Permit.

2. Basin Plan including:

   - Water quality objectives.

   - Beneficial uses.

   - Other policies as appropriate.

3. Current and proposed future TMDLs of 303(d)-listed pollutants.

4. Water quality criteria in the California Toxics Rule (CTR).

5. Water quality standards in the California Ocean Plan (COP).

6. The state and federal Antidegradation Policies.

7. The state Nonpoint Source Program Strategy and Implementation Plan (NPS Plan).

8. Performance Criteria made applicable to the Proposed Project through the USACE 404 Permit Process.

The Performance Criteria represent site-specific "regulatory standards" (as that term is used in the Draft Los Angeles CEQA Thresholds Guide) that, if met, indicate that the Proposed Project will not cause a significant adverse impact in light of what was recognized and authorized by the regulatory agencies to be the functions of the Freshwater Wetlands System. All of the applicable standards specifically outlined or included by reference in the applicable NPDES Permit (MS4 Permit) and the Basin Plan (including pollution, contamination, and nuisance as defined in Section 13050 of the CWC) provide a comprehensive regulatory system designed to address the current and potential future water quality issues in the County of Los Angeles. If the performance of the Proposed Project satisfies the above-cited plans, policies and procedures, both of the significance thresholds as defined in the Draft Los Angeles CEQA Thresholds Guide will be met.

3.4.1.1 Construction Impacts

Activities associated with construction of the proposed uses would generate pollutants which, if not controlled, could be discharged to receiving waters at levels which result in potentially adverse water quality impacts. Erosion-induced sediment is the pollutant most frequently associated with construction activities. Other pollutants of concern during construction include nutrients, trace metals, toxic chemicals and miscellaneous wastes. These pollutants originate from a variety of construction activities and are described below.

Sediment. Soil erosion is defined as the removal and loss of soil by the actions of water, gravity, and/or wind. Rainfall and resulting runoff can loosen, pick up, and carry soil particles to receiving waters. As rainfall and runoff increase, soil particles can become detached, rills and gullies can cut into the soil surface, and soil can be transported to receiving waters. Construction activities, including clearing and grading, result in exposed soils. Sediments also can be introduced into stormwater systems by tracking from vehicles as they exit the construction area and enter paved areas. Erosion and sedimentation caused by construction activities may adversely impact receiving waterbodies and affect recreational uses, fisheries and aesthetic qualities of waterways. Excessive sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, and reproduction. Sediment can transport pollutants attached to it including nutrients, trace metals, and hydrocarbons. Erosion and sediment control practices are required by the General Construction Permit issued by the SWRCB to reduce the amount of sediment leaving the Project's construction sites. As compliance with the General Construction Permit requires that runoff not cause or contribute to exceedances of applicable water quality standards (including those from the Basin Plan), compliance with the General Construction Permit would amount to compliance with Basin Plan objectives as well.

Nutrients. Products containing nitrogen, phosphorus and potassium are plant nutrients that would be used for fertilizing new landscape installed during development of the Project. Rainfall can transport these potential pollutants to receiving waters. Heavy use of commercial fertilizers can result in the discharge of nutrients to waterbodies resulting in excessive algal growth, and potentially accelerated rates of eutrophication. Some soils are naturally high in phosphorus, which when eroded can contribute to elevated levels in receiving waters. Erosion and sediment control measures (e.g., sand bagging and plastic sheeting of stockpiles) would minimize the discharge of nutrients. Also, only slow-release fertilizers applied directly to the soil would be used to establish vegetation and they would not be applied during or within 72 hours of a forecasted rain event. The Freshwater Marsh will be monitored per the O&M Manual for signs of eutrophication, such as low dissolved oxygen and excessive nutrient concentrations, to ensure the Marsh retains its designed level of habitat quality in accordance with the Performance Criteria.

Potential Contaminants Associated with Construction Materials. Galvanized metal, painted surfaces and preserved wood are surfaces exposed to stormwater as a result of construction activities. These coatings and treatments may contain metals, as well other potential contaminants such as creosote. These potential contaminants may enter receiving waters as surfaces corrode, flake, dissolve, decay or leach through contact with rainfall. Acidic constituents in rain may accelerate these processes. Soils also contains natural levels of trace metals such as arsenic, copper, and zinc.

Pesticides. Herbicides, insecticides and rodenticides are used commonly at construction sites. The unnecessary or improper application of these pesticides may result in receiving water contamination and pollution through drift, or transport of soil particles by wind and rainfall. Also, pesticides may inadvertently be released to the environment if not properly labeled, handled, or stored.

Toxic Chemicals Associated with Spills and Illegal Dumping of Construction Materials. As with pesticides, the storage, handling, and use of other chemicals, such as fuels, paints, solvents, and petroleum products, associated with construction activities could cause water quality impacts if spilled or released into or near surface waters.

Miscellaneous Wastes. Miscellaneous wastes include wash from concrete mixers, solid wastes resulting from vegetation removed during land clearing, wood and paper materials derived from packaging of building products, food containers such as paper, aluminum and metal cans, and sanitary wastes. The discharge of these wastes can lead to unsightly and polluted waterways. Concrete wash water can be toxic and requires proper control.

In conjunction with the adjacent Playa Vista First Phase Project, a Stormwater Pollution Prevention Plan (SWPPP)[206] was formulated to provide a comprehensive water quality control program for the adjacent Playa Vista First Phase Project construction activities to comply with the requirements of the General Construction Permit. As part of the Proposed Project, the existing SWPPP will be modified and updated to address Proposed Project construction. The SWPPP defines temporary BMPs to be implemented in accordance with the General Construction Permit. BMPs deployed during construction include the following categories:

- Drainage Control
- Waste Management Practices
- Tracking Controls (from vehicles)
- Vehicle and Equipment Cleaning, Fueling, and Maintenance Controls

[206] *SWRCB, Consolidated Storm Water Pollution Prevention Plan (SWPPP) Playa Vista Project, July 30, 2001 (as amended).*

- Sediment Controls
- Soil Stabilization (erosion control)
- Management of Pesticides and Fertilizers
- Material Delivery and Storage Controls
- Paving Operations Controls
- Training
- Spill Prevention and Control Procedures
- Contaminated Soil Management
- Measures to Comply with Waste Disposal, Sanitary Sewer, and Septic Regulations
- Concrete and Construction Materials Management
- Wind Erosion Control
- Ponded Water Management

The Proposed Project land uses and topography are similar to the adjacent Playa Vista First Phase Project. Therefore, the Proposed Project construction activities would be similar to those of the adjacent Playa Vista First Phase Project, for which the existing SWPPP has served effectively in addressing potential short-term water impacts. Implementation of the existing SWPPP, as amended for the Proposed Project, would adequately address potential water quality impacts associated with general construction activities. Therefore, implementation of construction BMPs required as part of the SWPPP, would control the potential pollution of stormwater such that construction activities would not create pollution, contamination or nuisance as defined in Section 13050 of the CWC or cause regulatory standards to be violated as defined in the applicable NPDES Permit (MS4 Permit) or Basin Plan for the receiving waterbody. Therefore, a less-than-significant impact would occur from construction activities.

3.4.1.2 Operational Impacts

Completion and operation of the proposed land uses would increase the amount of impervious surface area within the Proposed Project area and increase the amount of urban pollutants that are entrained in the surface runoff. If any such increases in runoff and/or pollutant sources are not adequately addressed through a surface runoff management system, the waterbodies that receive the runoff could be impacted. The significance thresholds, as defined above, include both project-specific and waterbody-specific requirements and objectives. Project-specific requirements and objectives include narrative water quality standards and guidelines, including the Basin Plan objectives, SUSMP design requirements, and the Performance Criteria. Waterbody-specific requirements and objectives include numerical and narrative water quality standards and guidelines (benchmarks) and no substantial increases in 303(d)-listed pollutants. Therefore, in the following assessment of the impacts of the Proposed Project with respect to the significance thresholds, an assessment of the project-specific requirements and objectives will be made, followed by the waterbody-specific requirements and objectives. After the discussion of each waterbody, a statement will be made regarding the potential of the Proposed Project to cause a significant impact on that waterbody with respect to the significance thresholds.

3.4.1.2.1 Municipal Stormwater NPDES Permit (MS4 Permit)

In order to assess whether the Proposed Project would meet or violate MS4 Permit requirements, the nature, design, and features of the proposed Storm Water Management Program were compared to the requirements of the SUSMP program. (See Subsection 2.1.1.3 for a description of the SUSMP Program.) This comparison includes the sizing of water quality facilities to the SUSMP Standards, which details the local standards for stormwater quality BMP design sizing as well as required source controls.

Treatment Sizing Requirements

The planned BMPs (e.g., Freshwater Wetlands System, water quality inlets) have been designed to treat storms larger than the 0.75-inch requirement for both the First Phase and Proposed Project on-site areas and for the existing development (off-site areas). The Freshwater Wetlands System has been designed to treat about one inch of runoff (volume and flow rate) from its contributing watershed of over 1,000 acres. In addition, the Freshwater Marsh has been designed to prevent flooding and stream channel erosion caused by storm events equal to or less than the 50-year return interval. Also, some features of the Proposed Project (such as the adjustable weir and low-flow diversion outlet structures in the Freshwater Marsh, which will control peak runoff rates while providing substantial control of stormwater pollutants of concern during dry-weather and average-size storm events) were planned and designed in response to the general SUSMP requirements. During the planning phase of the Proposed Project, natural areas and areas with significant slope were not considered for development; instead these areas have been designated as the Habitat Creation/Restoration Component. Commitments to a Public Education Program (including storm drain stenciling and signage, and ongoing BMP maintenance) were conceived during the early planning stages of the Proposed Project, as these are specific requirements of the City of Los Angeles' MS4 Permit and the SUSMP. All other SUSMP design requirements, including those for individual priority project categories have been included in the development plan for the Proposed Project.

Peak Runoff Discharge Rates and Channel Stability

In addition to the BMP sizing requirements, the SUSMP addresses peak stormwater runoff discharge rates and protection of slopes. As discussed in Subsection 3.1.4 of Section IV.C.(1), Hydrology, the Proposed Project is not expected to increase peak runoff discharge rates to the Riparian Corridor or the Ballona Channel to an extent that would cause increased potential for downstream erosion. In fact the Freshwater Wetlands System was designed and built to handle the Proposed Project flow rates. However, a brief discussion is provided here to further emphasize that the Proposed Project would not contribute to channel instability, and as such would not create a nuisance as defined in Section 13050 of the CWC or cause a regulatory standard to be violated as defined in the applicable NPDES Permit (MS4 Permit).

Increased impervious areas associated with urban development can cause changes in stream morphology (e.g., changes in the form and structure of biological organisms). While uncontrolled urbanization typically does increase the energy in receiving waters, the status and attributes of the receiving water must be taken into account when assessing the nature, extent, and significance of such an increase.

All runoff from the adjacent Playa Vista First Phase and Proposed Project site eventually is discharged to the estuary portion of the Ballona Channel, which is composed of grouted riprap-side slopes and an earthen bottom. The earthen bottom is subject to potential scour if discharge velocities increase substantially with project implementation. However, impacts are unlikely considering that runoff from larger events would overflow into the Ballona Wetlands. During smaller events, the runoff that enters the Freshwater Marsh would be detained for up to 72 hours before discharging, reducing the energy in the Ballona Channel during stress times when flows and velocities in the Channel generally are near maximum values. The existing Ballona Wetlands do not discharge to the Channel when the Channel is full due to the one-way flap gates. The potential impact of peak runoff to the Ballona Channel would not cause a regulatory standard to be violated as defined in the applicable NPDES stormwater permit or create pollution, contamination and nuisance, as defined in Section 13050 of the CWC; therefore, a less-than-significant impact to the Channel would occur.

The other channels that would receive runoff include the Riparian Corridor, a man-made vegetated channel, and the existing channels that are presently located in the Ballona Wetlands. All of these channels have, or will have very low slopes and, therefore, relatively low velocities, even during flood events. The Proposed Project includes additional diversion of stormwater to the Ballona Channel, which historically flowed directly to the Ballona Wetlands. Runoff volumes to the Ballona Wetlands from project areas would be reduced by nearly 90 percent as compared to pre-First Phase with the completion of the Proposed Project (i.e., including the adjacent Playa Vista First Phase Project and the Proposed Project and associated Freshwater Wetlands System that diverts freshwater flows from discharge into the Ballona Wetlands).

This reduction of runoff volumes, which offsets some portion of the increases that have occurred over the last approximately 50 years due to other development, would reduce runoff energy in the channels within the Ballona Wetlands over existing conditions. Spillover from the Freshwater Marsh to the Ballona Wetlands during larger storm events (i.e., greater than a 1-year design storm) is not expected to erode the receiving area of the Wetlands. The spillover weir for the Freshwater Marsh is constructed of articulate block (i.e., "armor-lock") and includes a spilling basin for energy dissipation of the overflow before entering the Ballona Wetlands.

During large storms, water would accumulate in the Wetlands and velocities are expected to be low within the Wetlands channels. The potential impact to the stability of the Ballona Wetlands would not cause a regulatory standard to be violated as defined in the applicable NPDES stormwater permit or create pollution, contamination and nuisance, as defined in Section 13050 of the CWC; therefore, a less-than-significant impact would occur.

BMP Maintenance

The SUSMP, as well as the MS4 Permit, requires proof that permanent structural BMPs will be maintained, including a signed statement from the developer accepting responsibility for BMP maintenance until the time of property transfer. At that time, a signed agreement from a public entity, or property recipient who would assume responsibility for the maintenance would be required. The "Ballona Freshwater Wetlands System Operations, Maintenance, and Monitoring Manual" provides a detailed maintenance and monitoring schedule for the Freshwater Wetlands System including a declaration of the entities responsible for funding and conducting the maintenance and monitoring.[207] In addition, the Proposed Project includes on-site operation and maintenance programs designed to minimize environmental impacts including: a tenant/resident education program, a street and catch basin cleaning program, a fertilizer and pesticide management system, and an internal shuttle system.

Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1) provides a more detailed evaluation of the many requirements of the SUSMP that must be developed and implemented for new development and redevelopment projects, including a comparison to the corresponding Playa Vista measures that would be implemented to meet those requirements. The results of a comparison (see Table 3-22 in Volume I, Section 3, of the Water Resources Technical Report (Appendix F-1) of the Proposed Project's Stormwater Management features with the existing MS4 Permit – SUSMP requirements, demonstrates that the Proposed Project as described meets or exceeds all requirements developed by the County of Los Angeles and approved by the RWQCB as being protective of receiving water quality and meeting the waste discharge requirements of the MS4 Permit. As such, implementation of the Proposed Project would not cause regulatory standards to be violated, as defined in the applicable NPDES Permit (MS4 Permit) for the receiving waterbody; hence, the Proposed Project impacts would be less than significant.

3.4.1.2.2 Basin Plan Water Quality Objectives

While the potential impacts caused by some pollutants of concern listed in the Basin Plan will be addressed in the waterbody-specific impacts subsections below, there are additional

[207] *Surface Water Resources, Inc., The Ballona Freshwater Wetlands System Operations, Maintenance and Monitoring Manual. Prepared for Playa Capital Company, 2001.*

parameters that are not waterbody-specific and are qualitatively discussed to adequately assess potential impacts of the Proposed Project. Dry-weather flows are often considered nuisance flows and several of the water quality parameters listed in the Basin Plan, such as biostimulatory substances, floatable materials (including oil and grease), color, taste and odor, can contribute to or can be associated with nuisance conditions. The following paragraphs discuss how the Proposed Project would meet the water quality objectives of the Basin Plan. For a detailed assessment of Basin Plan water quality objectives in comparison to Project Design Features, refer to Table 3-58 of Volume 1, Section 3, of the Water Resources Technical Report (Appendix F-1). An assessment of dry-weather flows, which is also addressed in the Basin Plan, can be found below in Subsection 3.4.1.2.3.

In general, increased runoff velocities could potentially cause bank erosion and channel scouring resulting in an increase in suspended or settleable solids in the receiving waters, which could lead to a condition of nuisance as defined in the Basin Plan. However, since no substantial increases in runoff velocities are expected as a result of the Proposed Project (see Table 25 on page 376 in Section IV.C.(1), Hydrology), the Proposed Project will not cause suspended or settleable materials in the receiving waters to be in concentrations that would constitute a nuisance or adversely affect beneficial uses. Therefore, the Proposed Project would not cause regulatory standards to be violated as defined in the Basin Plan for the receiving waterbody; hence, the Proposed Project would have a less-than-significant impact.

Bioaccumulation, Chemical Constituents, Pesticides, and Toxicity

The 303(d)-listed water quality parameters for the receiving waters of Project runoff that have a tendency to bioaccumulate include arsenic, cadmium, silver, lead, PCBs, PAHs, DDT, and chlordane. Most of these metals and chemicals are likely due to historical sources, as several of them bind tightly to soils and sediment and either do not degrade (e.g, metals) or degrade slowly (e.g., DDT, PCBs, etc.). Some of these chemicals have been banned by federal law (i.e., DDT, PCB) and are no longer in common use. However, others (e.g., PAHs) may reflect more recent impacts associated with urban activities (e.g., vehicle use and maintenance). Public education efforts would focus on informing residents and businesses of some of the potential toxic and bioaccumulative pollutants that they may have in their possession and how to properly store, use, and dispose of these materials to minimize environmental impacts. Also, the proposed treatment control BMPs, with regular maintenance, should minimize the transport of any unknown sources of contaminated soils and sediment to receiving waterbodies.

Selenium, another potentially toxic and bioaccumulative pollutant that may be present in discharges to receiving waters, is proposed to be listed in the 2002 303(d) list as causing impairment to the Ballona Creek upstream of the Proposed Project. Selenium is a naturally occurring metalloid that is an essential element for vertebrates at low concentrations and toxic at elevated concentrations. The tendency of selenium to bioaccumulate in living organisms has led to adverse impacts on fish and birds in several wetlands in the western United States.[208] The CTR criteria for total selenium in freshwater is 20 µg/L for acute exposure and 5 µg/L for chronic exposure. While selenium is not listed or proposed to be listed for Project receiving waters, it may pose a risk to biota in the Freshwater Wetlands System if persistent selenium loadings occur. However urban runoff (dry- or wet-weather) is not considered a significant source of selenium,[209] and only 3 out of 25 samples collected by the Los Angeles County Department of Public Works (1997-1999) [210] in the Ballona Creek just upstream of the estuary exceeded the chronic CTR criteria (no acute criteria exceedances), and these three samples only occurred during stormwater runoff events. Potential dry-weather issues associated with selenium are discussed in Section 3.4.1.2.3. During wet-weather, possible low levels of selenium are not expected to cause impairment to receiving waters because the anaerobic wetland soils of the Riparian Corridor and the Freshwater Marsh are expected to reduce soluble selenium to immobile forms, permanently setting apart stormwater selenium in the bottom sediments. Due to the relatively low levels of selenium expected to reach the Freshwater Wetlands System, the selenium in the soils are not expected to reach levels of concern in the near or distant future. However as a precaution and as part of the HMMP, the soils and vegetation in the Freshwater Wetlands System will be periodically analyzed for bioaccumulation of toxicants, including selenium. If concentrations of toxicants approach levels of concern in soils or biota, remedial actions such as dredging and vegetation removal will be performed. The frequency of these activities will be dictated by observed sediment accumulation rates, as well as periodic sediment quality analyses (see the Freshwater Wetlands System O&M Manual, Appendix F-2).

Although pesticides can be highly persistent in the environment (because many bind tightly to soils and sediment), the monitoring of Los Angeles County's stormwater has resulted in the determination that most pesticides are at undetectable levels and, when they are detectable, the concentrations minimally exceed detection levels. Notable concentrations of pesticides have not been detected in soils or surface water at the Proposed Project site. The Proposed Project has committed to minimizing the use of pesticides and herbicides through the use of both source and structural controls. Pesticides would only be applied when needed in public landscaped areas (the vast majority of on-site landscaping) by qualified landscape professionals and these chemicals would be carefully stored in appropriate facilities when not in use. Paving and landscaping would serve to contain potential historical sources of pesticides. Public education efforts would focus on: (1) informing the public of the dangers of poor sediment control on their

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[208] *United States Department of the Interior, National Irrigation Water Quality Program Information Report No. 3: Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment: Selenium, 1998. Participating agencies include Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Geological Survey, and Bureau of Indian Affairs.*

[209] *RWQCB, Santa Ana Region, Total Maximum Daily Load for Toxic Pollutants for San Diego Creek and Newport Bay, California, June 14, 2002 (Technical Support Documents, Part D-Selenium, Section III, Page 13).*

[210] *RWQCB, Los Angeles Region, Ballona Creek 303d Fact Sheet. March 29, 2002. [Online] www.swrcb.ca.gov/tmdl/docs/segments/region4/ballona303d_factsheet_nomun.doc.*

properties; (2) methods to minimize off-site runoff and reduce erosion; and (3) encouraging proper disposal of banned pesticides, if in existence.

The anaerobic conditions and associated bacterial populations that are expected in the wetland soils of the Riparian Corridor and the Freshwater Marsh will reduce many metals to insoluble forms that are less toxic and less bioavailable. Also, trace metals will be sampled several times per year in the water and annually in the sediment of the Freshwater Wetlands System to ensure trace metals concentrations do not exceed levels of concern (e.g., CTR criteria or probable effects levels [PELs] for water and sediment respectively).

The Freshwater Wetlands System O&M Manual specifies bioaccumulation/toxicity analysis and monitoring on vegetation and sediment removed during maintenance operations, which will occur as needed, at least every 10 to 20 years in the Freshwater Marsh and Riparian Corridor and possibly annually in the primary management areas. Calculations based upon estimated TSS removals indicate that the frequency of maintenance might be as low as once every 100 years in the primary management areas; however, a 10- to 20-year frequency was conservatively estimated to account for unanticipated sediment loadings caused by infrequently large storm events or other unpredictable causes. Vegetation and sediment removal frequencies will depend on sediment accumulation rates and results of annual sediment quality analyses conducted as part of the USACEs Five-Year Monitoring Program and the SWRCB Water Quality Certification Program. Samples of sediment and plant materials for bioaccumulation analysis will be submitted to a state certified laboratory for soluble Threshold Limit Concentration and Total Threshold Limit Concentration analyses. Results of the bioaccumulation tests, as well as the other sediment quality monitoring results, will be used to determine proper disposal methods of the removed materials and any further measures required in the Freshwater Wetlands System to retain habitat quality objectives.

As discussed above, through extensive source and treatment control BMPs, as well as frequent monitoring and maintenance planned for the Freshwater Wetlands System, the potential bioaccumulatory and toxicity impacts associated with metals, pesticides, and other toxic chemicals are not expected to create pollution, contamination, or nuisance as defined in Section 13050 of the CWC. As such, implementation of the Proposed Project would not cause regulatory standards to be violated; hence, the Proposed Project impacts would be less than significant with respect to bioaccumulation and toxicity.

Biochemical Oxygen Demand and Biostimulatory Substances

Biodegradable organic materials, such as human and animal waste and vegetative matter, are the primary substances that could cause increases in biochemical oxygen demand (BOD) and potential decreases in dissolved oxygen in the receiving waters. Public education efforts and enforcement of City ordinances would encourage picking up and properly disposing of pet wastes. Catch basin inserts and trash racks would be the primary treatment controls for removing organic debris from stormwater runoff. The Freshwater Marsh is expected to have the ability to decrease BOD through phytoassimilation (plant uptake) of organic materials. Biostimulatory substances may increase BOD, so some measures presented above (e.g., education programs, careful landscape maintenance, structural BMPs) apply to this category as well. Biostimulatory substances include fertilizers and other sources of nutrients, which stimulate growth of aquatic organisms such as algae. The modeling of nitrogen and phosphorus indicated that there would not be any significant impact to receiving waters with respect to these nutrients. In addition, only slow-release fertilizers that are applied directly to the soil would be used to establish vegetation and they would not be applied during or within 72 hours of a forecasted rain event. Erosion and sediment control measures that are implemented with the project would minimize the export of nutrients from the Proposed Project site.

As discussed above, through the use of on-site BMPs, the Freshwater Wetlands System, and public education, BOD and biostimulatory substances are not expected to create pollution, contamination, or nuisance as defined in Section 13050 of the CWC. As discussed below under the separate receiving waterbodies, nitrogen and phosphorus were not predicted by the pollutant loading model to exceed water quality benchmarks, and therefore are not expected to cause narrative regulatory standards to be violated as defined in the Basin Plan for the receiving waterbody; hence, the Proposed Project impacts would be less than significant with regard to BOD and biostimulatory substances.

Color and Odor

Color and odor associated with water can result from decomposition of organic matter or the reduction of inorganic compounds, such as sulfate. Color in water from man-made sources typically results from commercial or industrial discharges. The Proposed Project site would consist primarily of high-density residential development with some commercial areas. Industrial sources of pollutants would not be present on the Proposed Project site. Commercial areas would consist primarily of retail outlets, which are not expected to be a significant source of water quality constituents that would impart color or odor to dry or wet-weather flows originating from the Proposed Project site. Source controls such as street sweeping and waste management services are expected to reduce the amount of plant material, which during decomposition could cause coloration from the release of dissolved or colloidal substances, from reaching the stormwater management system. The structural BMPs of the Proposed Project are designed to remove and/or assimilate suspended and dissolved organic matter, reducing the potential for discoloration in discharges to receiving waters.

The production of hydrogen sulfide, an offensive smelling gas caused by the reduction of sulfates by anaerobic bacteria, is likely to occur or continue to occur in the reduced sediments of the Riparian Corridor, the Freshwater Marsh, and the Ballona Wetlands. However, hydrogen sulfide production is not expected to increase beyond current production rates because there will not be a significant source of sulfates from the Proposed Project. The movement of air due to the close proximity to the ocean will dissipate any hydrogen sulfide gas produced.

Therefore, substances that cause odor or discoloration of water are not expected to create pollution or nuisance as defined in Section 13050 of the CWC or to cause regulatory standards to be violated as defined in the Basin Plan for the receiving waterbody. Hence, the Proposed Project impacts would be less than significant with regard to color and odor of receiving waters.

Sediments and Turbidity

Erosion and sediment controls will be the primary source control measures to limit the export of suspended or settleable material (e.g., sediment) from the Proposed Project site. All construction activities occurring after Project buildout (with the adjacent Playa Vista First Phase Project and Proposed Project) will be closely monitored to ensure effective erosion and sediment control BMPs are used. Other source controls include the use of native vegetation in much of the landscaping in order to minimize the potential for erosion. By reducing the amount of exposed soils (erosional surfaces), the development of the Proposed Project will reduce erosion. Structural BMPs specifically designed to achieve high levels of particulate removal (and associated pollutants) will be implemented to provide treatment of stormwater and dry-weather flows. The combination of source and structural controls targeted at reducing the entrainment and transport of suspended or settleable material is expected to maintain concentrations of these constituents well below Basin Plan water quality objectives.

The entire Freshwater Wetlands System, particularly the primary management areas of the Freshwater Marsh, is specifically designed to capture sediments. Sedimentation rates will be annually monitored in the Marsh and the Riparian Corridor as part of the O&M Manual. If accumulated sediments begin significantly reducing the storage volume in these areas or, as mentioned previously, begin excessively segregating pollutants, sediment removal activities will be performed. Based on estimates of total suspended sediment loads to the Freshwater Marsh after completion of the adjacent Playa Vista First Phase Project and Proposed Project, the rate of sedimentation in the primary management areas should be reduced by approximately 6 percent on average. The reduction in sedimentation is due to on-site treatment controls (i.e., vegetated swales, roof-drain planter boxes, additional catch basin inserts, etc.) included in the Proposed Project (refer to Volume 1, Section 3 of the Water Resources Technical Report, Appendix F-1, for details). Therefore with regard to captured sediment, the Proposed Project is expected to reduce sedimentation rates in the Riparian Corridor and the Freshwater Marsh as compared to the First Phase Project.

Through control of suspended and settleable materials such as sediment, as well as the control of biostimulatory substances, as discussed above, the Proposed Project will not contribute to biological growth and increased turbidity. The Proposed Project impacts would be less than significant with regard to turbidity, erosion, or suspended or settleable material.

3.4.1.2.3 Assessment of Dry-Weather Flows

An important issue when assessing potential impacts to receiving waters, especially in arid climates (such as the Proposed Project), is dry-weather flows associated with urban activities. Sources of dry-weather flows, potentially associated with the Proposed Project, include flows from on-site urban activities (e.g., irrigation runoff, car washing, pavement washing, air conditioning condensate, etc.) and perennial flows within the Riparian Corridor, both of which may transport sediment, nutrients, vehicular pollutants, and/or animal waste products from the Proposed Project areas to receiving waters. Dry-weather flows will also enter the Proposed Project area from off-site land uses, including the Westchester Bluffs. The quantity of runoff associated with dry-weather flows from the Proposed Project area is expected to be negligible as the Proposed Project includes the use of vegetation with low water requirements in approximately 50 percent of the community landscaped areas (similar to what was approved as a mitigation measure for the adjacent Playa Vista First Phase Project), a careful irrigation program that emphasizes no excess irrigation, and a public education program to inform residents of the potential receiving waters impacts of excessive dry-weather runoff.

Perennial flows within the Riparian Corridor are part of the intent and design of the Corridor and will include off-site generated dry-weather flows as well as other sources to maintain the vegetation in the system. Other sources of dry-weather flows may include illicit sewer connections to the storm drain system, which could contribute to the input of human pathogens to receiving waters. However, since the Proposed Project will be a new development with a new storm and sewer system, illicit sewer connections are unlikely. The dry-weather input of human pathogens associated with animal waste are expected to be reduced by encouraging residents to pick up after their pets and to not feed wild birds. Therefore, the potential for the Proposed Project to violate future dry-weather TMDLs for fecal coliform or other human pathogens in the Ballona Creek Estuary and/or Santa Monica Bay would be less than significant.

Limited dry-weather monitoring data are available for assessing ambient dry-weather concentrations and loads to receiving waters after build-out of the Proposed Project. As indicated in Table 38 on pages 431 and 432, dry-weather water quality samples were collected on April 25 and June 28, 2002, and on April 2, 2003 in the Lincoln and Jefferson storm drains immediately upstream of the Freshwater Marsh. The analyses of the April 2002 samples included an extensive list of parameters, including conventional parameters such as pH, total suspended and settleable solids, and turbidity, as well as total metals, total petroleum hydrocarbons, and volatile organics. The June 2002 sampling event was intended to fill data gaps of the April sampling event. During this event, samples were analyzed for total and dissolved metals, salinity, and hardness so that a comparison to CTR criteria could be made. (Note the CTR criteria for metals are both hardness and salinity dependent). The analysis of the April 2003 sample included an even more extensive list of parameters than the other two sampling events, including bacteria, general minerals, hydrocarbons, metals, nutrients, PCBs, pesticides, semi-volatile organic carbon, toxicity, and volatile organic carbon. Out of all of the trace elements analyzed during the three dry-weather sampling events, only a handful of metals were detected above analytical detection limits, and as shown in Table 38 on pages 431 and 432 none of the detected values exceeded the chronic freshwater CTR criteria. Also, the samples analyzed for coliform bacteria (fecal and total) were well below the Basin Plan water quality objectives. While these data are not completely representative of the dry-weather runoff from the First Phase and Proposed Project areas, they do represent at least a portion of the ambient, perennial flows that will be supplying the Freshwater Marsh with a continual source of fresh water; the primary sources of which will be from off-site urban runoff and groundwater-supplemented flows.

For purposes of assessing the potential for metals contained in dry weather flows to impact downstream receiving waters, the available water quality data from the downstream end of the Freshwater Marsh were compared with the chronic saltwater criteria from the CTR. The following is a comparison of the CTR criteria[211] (in μg/l = micrograms per liter) with the observed dry-weather dissolved metals concentrations of discharges to the Ballona Channel from the Freshwater Marsh:

Constituent	Chronic CTR Criteria[212]	Outlet from Freshwater Marsh (μg/l)[213]
Arsenic	36	6
Cadmum	9.3	Not Detected
Copper	3.1	3.2
Lead	8.1	Not Detected
Mercury	0.04	Not Detected
Nickel	8.2	1.9
Silver	1.9	Not Detected
Zinc	81	1.2

[211] *The CTR criteria apply to receiving waters – not directly to discharges to those receiving waters. Thus, the CTR is not directly applicable to the influent to the Ballona Channel from the Freshwater Marsh. A comparison of the CTR to influent concentrations is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving water.*

[212] *Final Saltwater CTR Criteria – May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards.*

[213] *Camp Dresser & McKee Inc., April 2, 2003. Freshwater Marsh Water Quality Sampling, Dry Weather, Playa Vista, California. Based on actual sampling. The April 2003 sampling did not include the 8 acres of the Freshwater Marsh yet to be constructed.*

This comparison presents a conservative case because: (1) there are 8 acres of the Freshwater Marsh yet to be constructed, which will add significant treatment volumet to the existing Marsh; (2) construction of the Riparian Corridor has not yet begun and when completed will add significant treatment areas; and (3) the existing vegetation in the Freshwater Marsh is emergent and will continue to mature with time, increasing biological activities, enhancing flow distributions, etc., that should improve performance over time. These factors indicate that the removal efficiency of metals will be greater in the future than it is today. In addition, it is expected that the dissolved metals concentrations will diminish as dry weather flows enter the Ballona Channel and/or the Ballona Wetlands, as the brackish and organically rich environment at those locations will have a tendency to drive metals from a dissolved state into the fraction associated with particulates and organic matter in the water. Thus, the fact that the copper concentration is 0.1 part per billion above the chronic CTR criterion is not considered significant.

As discussed above in Subsection 3.4.1.2.2, Basin Plan Water Quality Objectives, the potentially toxic properties of selenium can be of concern in wetlands. Existing dry-weather monitoring data indicate that dry-weather runoff, particularly from urban areas, is not a significant source of selenium. Therefore since urban runoff in general and dry-weather runoff in particular are not likely sources of selenium, the primary potential sources of selenium near the Proposed Project include groundwater-supplemented flows, upland weathering of minerals, and atmospheric deposition. As shown in Table 39 on page 439, the maximum selenium concentration in groundwater near the project site is 5.6 μg/L and dry-weather water quality samples in the Freshwater Marsh (Table 38 on pages 431 and 432) have not contained detectable concentrations of selenium. As such, during dry weather, selenium is not expected to be a significant biological concern in the Freshwater Marsh or its receiving waters as a result of the Proposed Project. Therefore the potential biological impacts of selenium associated with dry-weather flows are anticipated to be less than significant as a result of the Proposed Project.

According to the Basin Plan, receiving waters designated with warm freshwater habitats (WARM) should not be altered by more than 5° F above the natural temperature and at no time should the waters exceed 80° F as a result of urban runoff. Currently, none of the water bodies receiving discharges from the Proposed Project are designated WARM. However, the narrative temperature objective for wetlands in the Basin Plan applies to the Ballona Wetlands and the Thermal Plan[214] applies to the Ballona Creek Estuary. The Basin Plan narrative objectives for wetlands states that wetlands shall be protected to prevent significant adverse effects on natural temperature and, according to the Thermal Plan, discharges to estuaries must not exceed 20° F above the natural receiving water temperature or cause the receiving waters to increase by more than 4° F above the natural temperature. The Ballona Wetlands will only receive discharges from the Freshwater Marsh during storm events greater than or equal to the 1-year storm; during

[214] *SWRCB, Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California, 1998.*

such events there would likely be significant cloud cover. Therefore, the Ballona Creek Estuary is the only receiving water that would be potentially impacted by elevated runoff temperatures. Runoff from the Proposed Project caused by excessive irrigation, car washing, pavement washing, and air conditioning condensate may absorb heat during sheet flow across pavement and deliver heated effluent to receiving waters. Also, shallow summer time flows in the Riparian Corridor and the primary management areas of the Freshwater Marsh may be warmed by solar radiation before discharging to receiving waters. Due to the relative size of the Proposed Project compared to the Ballona Creek Watershed (only about 1 percent of the watershed area), and the fact that the estuary portion of the Ballona Creek has diurnal tidal exchange, the runoff from the Proposed Project is not anticipated to cause increases in receiving water temperatures. Also, on-site BMPs are designed to reduce runoff volumes, as well as minimize the contact time of dry-weather sheet flow with impervious surfaces by quickly routing such flows to vegetated areas (e.g., roof-drain planter boxes and bioswales) and the subsurface storm drain system. With the establishment of riparian trees and vegetation in the Riparian Corridor and the primary management areas of the Freshwater Marsh, as required by the HMMP, temperature increases caused by solar radiation are expected to be lessened. In addition the mixing of deeper, cooler water in the main body of the Freshwater Marsh is expected to reduce water temperatures prior to discharging to the Ballona Creek Estuary. Therefore, the potential increase in receiving water temperatures is expected to be negligible as a result of the Proposed Project.

Based on a conservative assumption that the Proposed Project includes development typical of the existing urbanized areas in the Ballona Creek Watershed (i.e., highly connected impervious areas and few stormwater source controls), the estimated dry-weather runoff to the Freshwater Marsh would be approximately 0.5 to 1 cubic feet per second (cfs).[215] Low flows such as this would be detained in the Freshwater Marsh between 26 to 53 days in the summer and between 11 and 22 days in the winter before they would be slowly released to the Ballona Channel. With this extended detention time, substantial water quality improvements are expected, but this extended detention may contribute to increases in the production of mosquito larvae in the Freshwater Wetlands System. As part of the Operations, Maintenance and Monitoring Plan[216], the Freshwater Marsh will be monitored frequently (i.e., weekly inspections; monthly sampling) during the mosquito breeding season (May through October) for signs of increased mosquito populations or habitat, such as sightings of living larvae or adult mosquitoes, impedances to flow, high nutrient concentrations, or low dissolved oxygen. If during inspections, signs of increased mosquito habitat are noted, immediate remedial activities will be

[215] *This value was derived from an estimate of the Ballona Creek base flows to the Santa Monica Bay that are not attributable to rainfall, groundwater flow, or point source discharges. Source: Appendix E Part I of Draft Total Maximum Daily Load to Reduce Bacterial Indicator Densities at Santa Monica Bay Beaches during Wet Weather, RWQCB June 21, 2002. Refer to Volume I, Section 3 of the Technical Report (Appendix F-1) for details on how the value was derived.*

[216] *Surface Water Resources, Inc., The Ballona Freshwater Wetland System Operations, Maintenance, and Monitoring Manual, 2001.*

coordinated with the Los Angeles County West Vector Control District and/or USACE. The O&M Manual requires remedial activities that include: (1) removing vegetation, algal mats, or other objects that may be impeding flow and reducing access of predatory fish; (2) draining, filling, or treating isolated depressions containing stagnant water; (3) applying *Bacillus thuringiensis* bacterium (Bti) or alternative pesticide approved by the California Department of Health Services; and (4) introducing mosquito fish (*Gambusia affinis*) or other predatory species approved by the Los Angeles County West Vector Control District and the California Department of Fish and Game.

Based on minimal dry-weather runoff anticipated from the Proposed Project, the absence of exceedances of water quality criteria for trace elements including selenium in the existing dry-weather runoff, negligible expected increases in receiving water temperatures, extended residence time in the Freshwater Marsh (see discussion above), and the mosquito abatement procedures approved by the Los Angeles County West Vector Control District, USACE, and the California Department of Fish and Game, the Proposed Project would not create pollution, contamination, or nuisance as defined in Section 13050 of the CWC. As such, implementation of the Proposed Project would not cause regulatory standards to be violated as defined in the Basin Plan for the receiving waterbody; hence, the Proposed Project impacts would be less than significant with regard to dry-weather flows.

3.4.1.2.4 Santa Monica Bay

Santa Monica Bay receives urban runoff directly from the Ballona Channel. Development of the Proposed Project could potentially increase total annual pollutant loads to the Bay. To avoid this potential impact, the Proposed Project would incorporate a number of both source control and treatment control BMPs. A substantial proportion of stormwater pollutants that otherwise would be generated and conveyed from the Proposed Project site as well as from the adjacent Playa Vista First Phase Project would be reduced by on-site source, design and treatment control stormwater BMPs. Pollutants that cannot be further reduced at the source or retained on-site, and pollutants originating from off-site land uses tributary to the site, would be managed to acceptable levels by the natural processes of pollutant removal in the planned Freshwater Wetlands System.

Following completion of the Proposed Project and the incorporation of the proposed water quality features (i.e., Riparian Corridor and Freshwater Marsh), the predicted annual pollutant concentrations to the Santa Monica Bay via the Ballona Channel from Project runoff and upland areas that flow through the Project site either are unchanged or decrease for all modeled constituents. With the adjacent Playa Vista First Phase Project and the Proposed Project, pollutant loads to the Ballona Channel are predicted to decrease notably (7 to 42 percent) compared to the predicted loads under pre-First Phase Project conditions. One of the primary factors in this decrease is the significant treatment of existing development runoff that the

Freshwater Wetlands System provides, along with on-site stormwater treatment. As discussed below in Subsection 3.4.1.2., the Proposed Project would not cause regulatory standards to be violated in the Ballona Channel and therefore Proposed Project runoff would not cause regulatory standards (COP portion of the Basin Plan) to be violated in the Santa Monica Bay; hence, the Proposed Project impacts would be less than significant.

As shown in Table 31 on page 406, the Santa Monica Bay has 16 water quality parameters listed on the 303(d) list. Among the water quality parameters for the metals modeled for this EIR (copper, lead, and zinc) all of which are predicted to be well below the CTR criteria with implementation of the Proposed Project. The other metals listed include cadmium, mercury, nickel, and silver, which are proposed by the SWRCB for delisting. These metals are usually associated with specific industrial and commercial processes, vehicular pollutants, or improper disposal of items containing them (refer to Volume I, Section 3 of the Water Resources Technical Report, Appendix F-1, for detailed information on potential sources of these metals). Other toxic chemicals included on the 303(d) list for Santa Monica Bay include pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). These chemicals as well as the metals mentioned above may contribute to the fish consumption advisory and sediment toxicity parameters included on Santa Monica Bay's 303(d) list. Businesses utilizing materials and/or generating wastes containing any of these 303(d)-listed pollutants would be subject to strict materials handling and disposal requirements. Education and outreach efforts would focus on informing the public and businesses of consumer products containing these pollutants, how to properly dispose of them, and where to find, and why they should use, less toxic alternatives. Roadside BMPs and the Freshwater Wetlands System are expected to control motor vehicle-related pollutants. As mentioned above in the general discussion of dry-weather flows, the Proposed Project is unlikely to contribute to high coliform counts (a 303(d) listed parameter for the Santa Monica Bay Beaches with draft Dry-weather and Wet-weather TMDLs currently being reviewed by the SWRCB) in the Santa Monica Bay because a new sewer system, which would be unlikely to have leaks, would be installed on-site. The public would be encouraged through public outreach to pick up after their pets and to minimize dry-weather runoff from their properties, as dry-weather runoff is often associated with higher levels of bacteria. Additional discussion on this topic is provided in Subsection 3.4.1.2.5, Ballona Channel, as the Channel also has a draft TMDL for total coliform.

With the planned source control and treatment control BMPs as well as the fact that the stormwater runoff from the Proposed Project would only contribute a very minor fraction of the total runoff to the Santa Monica Bay (less than 0.4 percent),[217] the Proposed Project is not expected to cause or contribute to exceedances of regulatory standards applicable to Santa

[217] *Stenstrom, M.L. and E.W. Strecker, "Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay, Volume 1, Annual Pollutant Loadings to Santa Monica Bay from Stormwater Runoff" UCLA School of Engineering and Applied Science, 1993, UCLA ENG 93-62.*

Monica Bay (such as CTR criteria) and would not create pollution, contamination, or nuisance conditions as defined in Section 13050 of the CWC in Santa Monica Bay. Hence, the Proposed Project impacts would be less than significant.

3.4.1.2.5 Ballona Channel

Ballona Creek is the largest tributary stream in the Santa Monica Bay watershed with approximately 176 of its 212-square mile area being urban development. The major tributaries to the Ballona Creek include Centinela Creek, Sepulveda Canyon Channel, Benedict Canyon Channel, and numerous storm drains that extend well into Beverly Hills. At the outfall of the Freshwater Marsh and the Ballona Wetlands, Ballona Creek is a grouted riprap-sided, earthen bottom channel with estuarine tidal exchange and dry-weather and stormwater inflows. On average, 92 percent of the discharges from the Freshwater Marsh (this is equivalent to runoff from a 1-year design storm event or less) will drain directly to the Ballona Channel with the remaining 8 percent (runoff from storms greater than a 1-year design storm event) flowing through the Ballona Wetlands prior to draining to the Channel. Discharges from the Ballona Wetlands enter the Ballona Channel before discharging to Santa Monica Bay.

The predicted annual loads and concentrations to Ballona Channel from the upstream tributary areas as well as the adjacent Playa Vista First Phase Project and the Proposed Project are shown in Table 44 on page 479. As indicated in the table, the loads and concentrations associated with the runoff from the adjacent Playa Vista First Phase Project and the Proposed Project would achieve a no-net increase from pre-First Phase conditions.

In addition to the loads predictions, there is a substantial decrease in predicted concentrations in the total influent to the Ballona Channel after the Proposed Project (buildout of the adjacent Playa Vista First Phase Project and Proposed Project) as compared to the pre-First Phase conditions. The substantial decrease in total suspended solids (TSS) concentrations is attributable to the pollutant removal achieved through the natural wetlands cleansing process of the Freshwater Wetlands System, as this system was specifically intended and designed for stormwater runoff from the adjacent Playa Vista First Phase Project and Proposed Project, as well as to enhance the water quality of existing urban runoff. In the modeling analysis, it was conservatively assumed that the Ballona Wetlands in its degraded condition would provide only marginal water quality benefits compared to the constructed Freshwater Wetlands System specifically designed for this purpose. Refer to Section 3.2.4.3.1, Model Methodology, of Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1) for the assumptions used to predict pollutant removal performance of the Freshwater Wetlands System and the Ballona Wetlands.

Table 44

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE BALLONA CHANNEL FROM Freshwater Marsh and Ballona Wetlands

	Predicted Average Loads[a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase[b]	67,887	395	2,321	2,592	25.5	10.6	15.4	7.1	63.3	26.1	27,497
With Playa Vista First Phase Project	36,920	287	1,885	1,794	14.4	9.6	8.8	4.9	49.3	18.8	31,447
With Proposed Project[c]	38,413	302	1,9772	1,893	15.1	10.1	9.3	5.2	51.8	19.7	33,211
Percent Change from Pre-First Phase to Proposed Project	-43%	-24%	-15%	-27%	41%	-4%	40%	26%	18%	25%	+21%

	Predicted Average Concentrations[a]										
	(mg/L)				(μg/L)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase[b]	39.5	0.23	1.4	1.5	14.8	6.5	90.0	4.1	36.9	15.2	27,497
With Playa Vista First Phase Project	18.8	0.15	1.0	0.9	7.3	4.9	4.5	2.5	25.1	9.6	31,447
With Proposed Project[c]	18.5	0.15	1.0	0.9	7.3	4.9	4.5	2.5	25.0	9.5	33,211
Percent Change from Pre-First Phase to Proposed Project	-53%	-37%	-29%	-40%	51%	21%	50%	39%	32%	38%	+21%

lbs/yr = pounds per year
μg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per lite
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding.*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3, of the Water Resources Technical Report (Appendix F-1).*
[c] *Proposed Project at buildout which would also include the adjacent Playa Vista First Phase Project.*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants.

The project goal of no-net increase in concentrations and total loads to the Ballona Channel is made possible due to significant natural pollutant removal provided by the Freshwater Wetlands System of off-site drainages, including the Jefferson Storm Drain, the Lincoln Storm Drain South, and the Westchester Bluffs.[218] As mentioned in Subsection 3.1.1.2, if the Project

[218] *Wetlands are recognized as effectively improving stormwater quality. See, e.g., ASCE/EPA National BMP Database www.bmpdatabase.org.*

can demonstrate that beneficial uses in receiving waters are maintained (through either "no increase" or decreases) in concentrations or total pollutant loads, it will have met the requirements of the State's Antidegradation Policy. Therefore, the Proposed Project would not contribute to violations of applicable and related regulatory standards as defined in the Basin Plan for the receiving waterbody; hence, the Proposed Project impacts would be less than significant.

Table 45 on page 481 provides a breakdown of the estimated average concentrations that contribute to the influent into the Ballona Channel with the Playa Vista First Phase and the Proposed Project. As shown in Table 45, the concentrations of the influent from the Ballona Wetlands have higher concentrations of total suspended solids (TSS), total phosphorus (TP), total Kjeldahl nitrogen (TKN), and total and dissolved copper (TCu and DCu, respectively) and total and dissolved zinc (TZn and DZn zinc, respectively) than the influent from the Freshwater Marsh. These higher concentrations are due to the fact that the Ballona Wetlands primarily receive stormwater runoff from off-site tributary areas that do not receive treatment, as well as low treatment levels projected for the Ballona Wetlands. The slightly higher concentrations of total and dissolved lead (TPb and DPb, respectively) in the Freshwater Marsh effluent compared to the Ballona Wetlands correspond to the relatively smaller amount of runoff generated (and associated pollutants) from off-site Ballona Wetlands tributary areas (which is approximately 25 percent of the Ballona Channel influent volume) compared to the Freshwater Marsh tributary area and the concentration limits applied in the model to the effluent of the Freshwater Marsh.

Table 46 on page 482 provides a breakdown of the metals concentrations that contribute to the influent quality of the Ballona Channel from the Proposed Project compared to acute CTR criteria. It is important to note that these predicted influent concentrations do not take into account the ambient water quality of the Ballona Channel or the substantial amount of stormwater runoff that occurs upstream of the Channel segment adjacent to Playa Vista (e.g., the Proposed Project area is less than 1 percent of the total Ballona Creek Watershed). However, to account for the tendency of dissolved metals to bind with organic matter (metals complexion) during the initial mixing of freshwater with the estuarine waters of the Ballona Channel, an effective dissolved metals concentration was estimated using the observed dissolved and particulate fractionation values from the County of Los Angeles' mass-emissions data for Ballona Creek.[219] These effective concentrations more accurately represent the likely contribution of dissolved metals to the saline receiving waters of the Proposed Project because

[219] *Los Angeles County Department of Public Works, 1994-2000 Integrated Receiving Waters Impact Report (http://ladpw.org/wmd/npdes/9400_wq_summaries.zip). The use of the L.A. County data for estimating changes to dissolved metals fractionation is considered a conservative use of site-specific data, as water quality monitoring in the San Francisco Bay Estuary indicates that dissolved copper, lead, and zinc are rarely measured at concentrations greater than 50 percent of the total metals concentrations (San Francisco Estuary Institute, SFEI, 1997. Regional Monitoring Program for Trace Substances, 1997 Annual Report).*

Table 45

REPRESENTATIVE STORMWATER CONCENTRATIONS TO THE BALLONA CHANNEL FROM FRESHWATER MARSH AND BALLONA WETLANDS WITH THE PLAYA VISTA FIRST PHASE PROJECT AND PROPOSED PROJECT

	Predicted Average Concentrations									
	(mg/L)				(µg/L)					
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn
Effective Freshwater Marsh invluent to Ballona Channel (92% of total effluent)[a]	11.3	0.13	0.84	0.90	6.0	2.9	4.6	2.7	20.9	6.9
Ballona Wetlands	39.5	0.18	1.30	0.95	10.9	5.5	4.2	2.1	36.9	15.5
Ballona Channel Total Influent Concentrations	**18.5**	**0.15**	**0.95**	**0.9**	**7.3**	**4.9**	**4.5**	**2.5**	**25.0**	**9.5**

mg/L = milligrams per liter | *µg/L = micrograms per liter* | *TSS = Total Suspended Solids*
TP = Total Phosphorus | *TKN = Total Kjeldahl Nitrogen* | *O&G = Oil and Grease*
TCu = Total Copper | *DCu = Dissolved Copper* | *TPb = Total Lead*
DPb = Dissolved Lead | *TZn = Total Zinc* | *DZn = Dissolved Zinc*

[a] *The effective influent concentrations from the Freshwater Marsh represent the predicted concentrations after being adjusted to account for observed dissolved and particulate metals fractionation in estuarine waters. For a more detailed explanation, see Volume III, Appendix G, of the Water Resources Technical Report (Appendix F-1).*

Source: GeoSyntec Consultants

metals tend to bind more readily with organic complexes in saltwater systems than in freshwater systems.[220, 221] Refer to Volume III, Appendix G, of the Water Resources Technical Report (Appendix F-1) for information and additional supporting references for the behavior of metals in saline waters. As shown in Table 46 on page 482, the predicted effective dissolved metals concentrations to the Ballona Channel from the Freshwater Wetlands System meet the acute CTR criteria. Comparison of chronic CTR criteria, which is based on a 4-day averaging period rather than an instantaneous maximum, to predicted metals concentrations is not considered appropriate for assessing potential impacts of stormwater runoff at the Proposed Project due to the short storm durations usually encountered in southern California (i.e., average storm duration is less than 12 hours). Nevertheless the metals concentrations are still predicted to meet the chronic CTR criteria (DCu: 3.1 µg/L, DPb: 8.1 µg/L, DZn: 81 µg/L).

[220] *Bruland, K.W., J.R. Donat, and D.A. Hutchins, 1991. "Interactive Influences of Bioactive Trace Metals on Biological Production in Oceanic Waters," Limnological Oceanography, 36:1555-1577.*

[221] *Lores, E.M., and J.R. Pennock, 1998. "The Effect of Salinity on Binding of Cd, Cr, Cu, and Zn to Dissolved Organic Matter," Chemosphere, 39(5), 861-874.*

Table 46

REPRESENTATIVE STORMWATER DISSOLVED METALS CONCENTRATIONS OF DISCHARGES TO THE BALLONA CHANNEL FROM THE FRESHWATER MARSH COMPARED TO CTR CRITERIA*

Parameter	Acute CTR (µg/L) [a]	Predicted Effective Concentration (µg/L) [b]
Dissolved Copper (DCu)	4.8	2.9
Dissolved Lead (DPb)	210	2.7
Dissolved Zinc (DZn)	90	6.9

µg/L = micrograms per liter *CTR = California Toxics Rule*

* *The CTR criteria apply to receiving waters – not directly to discharges to those receiving waters. Thus, the CTR is not directly applicable to the influent to the Channel. A comparison of the CTR to influent concentrations is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

[a] *Final Saltwater CTR Criteria – May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards.*

[b] *The effective influent concentrations from the Freshwater Marsh represent the predicted concentrations after being adjusted to account fo observed dissolved and particulate metals fractionation in estuarine waters. For a more detailed explanation, see Volume III, Appendix G, of the Water Resources Technical Report (Appendix F-1).*

Source: GeoSyntec Consultants

Table 47 on page 483 shows the comparison of the predicted influent to the Ballona Channel to water quality benchmarks for TKN, total phosphorus, total suspended solids, and oil and grease. All of the predicted concentrations are below water quality benchmarks. Therefore, the Proposed Project would not adversely affect beneficial uses or cause a condition of nuisance associated with suspended materials, oil and grease, or biostimulatory substances as defined in the Basin Plan, in the receiving waterbody. Hence, the Proposed Project impacts associated with these water quality parameters would be less than significant, in these respects.

As shown in Table 31 on page 406, the 303(d)-listed parameters for the Ballona Creek Estuary portion of the Ballona Channel includes pesticides, lead, zinc, PAHs, PCBs, high coliform count, sediment toxicity, and shellfish harvesting advisory. The modeling of lead and zinc in Table 44 on page 479 and Table 45 on page 481 show that the listed metals are not predicted to exceed regulatory standards and would not be substantially increased beyond existing conditions. As discussed under the Santa Monica Bay assessment, PAHs and PCBs, as well as the sediment toxicity and shellfish harvesting advisory that are likely associated with metals and these toxic chemicals, are not expected to be adversely impacted by the Proposed Project due to implementation of source and treatment-control BMPs. High coliform counts are commonly introduced into stormwater runoff through exposure to animal and human wastes. Animal wastes deposited on streets or within drainage channels can be washed into storm drains.

Table 47

REPRESENTATIVE STORMWATER CONCENTRATIONS TO THE BALLONA CHANNEL FROM THE FRESHWATER MARSH COMPARED TO WATER QUALITY BENCHMARKS *

Parameter	Water Quality Benchmark	Predicted Concentration
Total Phosphorus (TP), (mg/L) [a]	0.20	0.16
Total Kjeldahl Nitrogen (TKN), (mg/L) [a]	1.5	0.9
Total Suspended Solids (TSS), (mg/L) [b]	60	17.7
Oil and Grease (O&G), (mg/L) [b]	25	0.9

mg/L = milligrams per liter

* *The Water Quality benchmarks apply to receiving waters – not directly to discharges to those receiving waters. Thus the water quality benchmarks are not directly applicable to the Channel. A comparison of the water quality benchmarks is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

[a] *U.S. EPA, 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion III. EPA 822-B-00-016.*

[b] *SWRCB, 2001. California Ocean Plan: Water Quality Control Plan Ocean Waters of California.*

Source: GeoSyntec Consultants

Human waste can be introduced into the storm drain system through illegal wastewater connections or through leaks from existing wastewater pipelines. Since the Proposed Project would be a new development, the wastewater collection system would be new, thus making leaks to the storm drain unlikely and minimizing the opportunity for illegal cross-connections. Public education encouraging compliance with animal defecation laws ("pick up after your pet") is expected to reduce animal waste washed into the storm drains. In addition to these source control measures, the Riparian Corridor and the shallow primary management areas of the Freshwater Marsh are expected to reduce fecal coliform counts, as exposure to sunlight has been shown to greatly reduce coliform densities.[222]

One of the 303(d)-listed parameters is trash. A trash TMDL for the Ballona Creek and Ballona Wetland, which includes the Ballona Creek Estuary, has been approved. The Proposed Project includes stormwater BMPs that would be expected to result in a near zero release of any trash through the storm drain system. Residents and visitors would be educated through the use of signage and other programs regarding proper trash disposal. Frequent street sweeping would effectively remove trash from street surfaces. In addition, the Proposed Project includes

[222] *Burkhardt III, W., K. R. Calci, W. D. Watkins, S. R. Rippy, and S. J. Chirtel, 2000. Inactivation of Indicator Microorganisms in Estuarine Waters. Wat. Res. Vol. 34, No. 8, pp. 2207-2214.*

installation of trash racks at the inlets to the Riparian Corridor, full capture trash screens,[223] which meet TMDL requirements, at the inlets to the Freshwater Marsh, and managed indoor trash collection and storage areas for residents and managed trash collection areas for commercial businesses.

Based on the evaluation of the changes in loads and concentrations in Project discharges to the Ballona Channel, the comparison of modeled constituents to water quality benchmarks, and the assessment of 303(d)-listed parameters (including trash TMDL), the Proposed Project would not cause regulatory standards to be violated as defined or referenced in the applicable NPDES Permit (MS4 Permit) or Basin Plan. In addition, by meeting these regulatory standards and the fact that the Proposed Project is less than 1 percent of the Ballona Creek tributary area, the Proposed Project is not expected to create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code in the Ballona Channel. Therefore, a less-than-significant impact to the Ballona Channel is expected to occur as a result of the Proposed Project in these respects.

3.4.1.2.6 Ballona Wetlands

Prior to the construction of the Freshwater Marsh, all of the stormwater runoff from the Playa Vista Project area and adjacent off-site areas drained to the Ballona Wetlands prior to discharging to the Ballona Channel. Over the years, this input of urban stormwater contributed to the current degraded state of the Ballona Wetlands. To estimate the water quality impacts of the Proposed Project on Ballona Wetlands, the predicted average pollutant loads and concentrations after the Proposed Project are compared to the predicted average pollutant loads and concentrations during pre-First Phase and after the Playa Vista First Phase Project. Predicted annual average pollutant concentrations from the Proposed Project were also compared to water quality benchmarks. For the purposes of this analysis, since the Freshwater Marsh was not constructed prior to the adjacent Playa Vista First Phase Project, the loads to the Freshwater Marsh under pre-First Phase conditions are estimated using the runoff discharging to the eastern portion of the Ballona Wetlands.

The total reductions in loads and concentrations after the completion of the adjacent Playa Vista First Phase Project and the Proposed Project compared to pre-First Phase levels meets the Playa Vista buildout project goal of improved water quality. Nearly all of the runoff entering the Ballona Wetlands after project buildout (Playa Vista First Phase and Proposed Project) would be from untreated off-site areas that are not tributary to the adjacent Playa Vista

[223] *A full capture device is any device or system that traps all particles retained by a 5 millimeter mesh screen and has a design treatment capacity of not less than the peak flow resulting from a 1-year, 1-hour, storm (determined to be 0.6 inches per hour for the Los Angeles River Watershed, and assumed to be similar for the Ballona Creek Watershed).*

First Phase Project or Proposed Project areas. As indicated on Table 48 on page 486, the loads and concentrations after Proposed Project would achieve a no-net increase from pre-First Phase conditions. Since the Proposed Project would not increase loads or concentrations relative to the pre-First Phase conditions, the State and Federal Antidegradation Policies would be met. Also, the decrease in concentrations demonstrates that the Project would not create pollution or nuisance with respect to the modeled parameters as defined in Section 13050 of the California Water Code; hence, the Proposed Project impacts would be less than significant.

The reduction in loads and concentrations after the Proposed Project is related to the large amount of runoff that discharged directly to the Ballona Wetlands prior to construction of the Freshwater Marsh. Currently, this runoff flows to the Freshwater Marsh where water quality is improved prior to discharge to the Ballona Channel. This diverted runoff accounts for nearly 90 percent of the total runoff volume that once flowed untreated to the Ballona Wetlands. Overflows to the Ballona Wetlands[224] will receive some stormwater quality management in the Freshwater Marsh, contributing to additional reduction in the pollutant loads and concentrations discharging to the Ballona Wetlands.

Table 49 on page 487 shows the predicted pollutant influent concentrations to the Ballona Wetlands from each of the primary contributing source areas. (See Appendix F-1 for the average concentrations that relate to the pre-First Phase and with Playa Vista First Phase Project.) As indicated in Table 49, the influent concentrations of the runoff entering the Ballona Wetlands from the Freshwater Marsh (which includes contributions from the adjacent Playa Vista First Phase Project and the Proposed Project) are less than the influent concentrations from off-site areas for all constituents except lead, due to the size and type of land uses (more commercial and industrial) associated with the off-site tributary area of the Freshwater Marsh). The predicted influent concentrations indicate an improvement in water quality of the Ballona Wetlands due to the initial mixing that would be caused by Freshwater Marsh overflow to the Ballona Wetlands. Historically, the Ballona Wetlands has been a brackish marsh that supports a variety of saltwater tolerant species of flora and fauna. Now that less freshwater will enter the Ballona Wetlands due to the diversion of runoff to the Freshwater Marsh, habitat alterations due to urban runoff impacts should be reduced.

The pollutant concentrations in the total influent to the Ballona Wetlands compared to the water quality benchmarks, are shown in Table 50 on page 488 and Table 51 on page 489. All of the predicted concentrations are well below the water quality benchmarks and the predicted acute CTR criteria. As with the Ballona Channel, the dissolved metals concentrations predicted in the

[224] *Overflows to the Ballona Wetlands from the Freshwater Marsh is the runoff from a greater than 1-year design storm event that flows over the weir. This amount of runoff is equivalent to 8 percent of the annual average runoff.*

Table 48

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE BALLONA WETLANDS FROM THE FRESHWATER MARSH

	Predicted Average Loads[a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	Tcu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase[b]	71,883	241	1,459	1,671	15.9	8.6	9.7	4.4	124.9	44.7	13,329
With Playa Vista First Phase Project	1,417	17	105	113	0.8	0.6	0.6	0.3	2.6	0.9	2,008
With Proposed Project[c]	1,516	18	112	121	.08	0.6	.06	.04	2.8	1.0	2,149
Percent Change from Pre-First Phase to Proposed Project	-98%	-93%	-92%	-93%	-95%	-93%	-94%	92%	-98%	-98%	-84%
	Predicted Average Concentrations[a]										
	(mg/L)				(μg/L)						Volume
	TSS	TP	TKN	O&G	Tcu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase[b]	86.4	0.29	1.75	2.01	19.1	10.3	11.6	5.3	150.1	53.7	13,329
With Playa Vista First Phase Project	11.3	0.13	0.84	0.90	6.0	4.7	4.6	2.7	20.9	7.5	2,008
With Proposed Project[c]	11.3	0.13	0.84	0.90	6.0	4.7	4.6	2.7	20.9	7.5	2,149
Percent Change from Pre-First Phase to Proposed Project	-87%	54%	52%	-55%	-69%	-55%	60%	50%	-86%	86%	-84%

lbs/yr = pounds per year
μg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding*

[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1).*

[c] *Which also includes adjacent Playa Vista First Phase Project (i.e., buildout of Playa Vista).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

discharge to the Ballona Wetlands from the Freshwater Marsh were adjusted to account for metals complexion in the saline waters of the Ballona Wetlands (see Volume III, Appendix G, of the Water Resources Technical Report, Appendix F-1, for additional information). Note that effective effluent concentrations show in Table 50 on page 488 also meet the chronic CTR criteria. Therefore, the Proposed Project would not cause regulatory standards associated with these water quality constituents to be violated; hence, the Proposed Project impacts would be less than significant in these respects.

Table 49

REPRESENTATIVE STORMWATER CONCENTRATIONS TO THE BALLONA WETLANDS WITH PLAYA VISTA FIRST PHASE PROJECT AND PROPOSED PROJECT

	Predicted Average Concentrations									
	(mg/L)				(µg/L)					
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn
Off-Site Stormwater Runoff Direct to Ballona Wetlands	112.6	0.20	1.5	1.0	12.6	5.8	4.1	1.9	76.7	45.7
Effective Freshwater Marsh Overflow to Ballona Wetlands [a]	11.3	0.13	0.8	0.9	6.0	2.9	4.6	2.7	20.9	6.9
Ballona Wetlands Total Influent	**87.0**	**0.18**	**1.3**	**1.0**	**10.9**	**5.5**	**4.2**	**2.1**	**62.6**	**36.0**

mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead
µg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc

[a] *The effective influent concentrations from the Freshwater Marsh represent the predicted concentrations after being adjusted to account for observed dissolved and particulate metals fractionation in estuarine waters. For a more detailed explanation, see Volume III, Appendix G, of the Water Resources Technical Report (Appendix F-1).*

Source: GeoSyntec Consultants

As shown in Table 31 on page 406, the 303(d) list for the Ballona Wetlands includes arsenic, trash, exotic vegetation, habitat alterations, hydromodifications, and reduced tidal flushing. Low levels of arsenic have been detected in stormwater runoff from monitoring conducted by Los Angeles County. Potential sources of arsenic include native soils, wood preservatives (chromated copper arsenate (CCA)), lead-acid batteries for automobiles, and municipal wastewater.[225] The Proposed Project would use public education and outreach as the primary source control measure for arsenic. Contractors and the general public will be encouraged not to use CCA preserved wood products and will be provided with information on how to properly dispose of used automobile batteries.

A trash TMDL for the Ballona Creek and Wetland, which includes the Ballona Wetlands, has been approved. The Proposed Project includes stormwater BMPs that would be expected to result in a near zero release of any trash through the storm drain system. Residents and visitors would be educated through the use of signage and other programs regarding proper trash disposal. Frequent street sweeping would effectively remove trash from street surfaces. In addition, the Proposed Project includes installation of trash racks at inlets to the Riparian Corridor and full capture trash screens, which meet TMDL requirements, at the inlets to the

[225] *The State of Santa Monica Bay Part One: Assessment of Conditions and Pollution Impacts, Southern California Association of Governments, by MBC Applied Environmental Sciences, October 1998.*

Table 50

REPRESENTATIVE STORMWATER DISSOLVED METALS CONCENTRATIONS OF DISCHARGES TO THE BALLONA WETLANDS FROM THE FRESHWATER MARSH COMPARED TO CTR CRITERIA*

Parameter	Acute CTR (µg/L)[a]	Predicted Effective Concentration (µg/L)[b]
Dissolved Copper (DCu)	4.8	2.9
Dissolved Lead (DPb)	210	2.7
Dissolved Zinc (DZn)	90	6.9

µg/L = micrograms per liter
CTR = California Toxics Rule

* *The CTR criteria apply to receiving waters – not directly to discharges to those receiving waters. Thus, the CTR is not directly applicable to the influent to the Wetlands. A comparison of the CTR to influent concentrations is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving water.*

[a] *Final Saltwater CTR Criteria – May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards.*

[b] *The effective influent concentrations from the Freshwater Marsh represent the predicted concentrations after being adjusted to account for observed dissolved and particulate metals fractionation in estuarine waters. For a more detailed explanation, see Volume III, Appendix G, of the Water Resources Technical Report (Appendix F-1).*

Source: GeoSyntec Consultants

Freshwater Marsh, managed in-door trash collection and storage areas for residents, and managed trash collection areas for commercial businesses.

The Proposed Project would use only native vegetation in the Riparian Corridor and within the Habitat Creation/Restoration Component. Landscaping in the residential and commercial common areas would use primarily native vegetation to the maximum extent feasible. Any non-native vegetation selected for landscaping would be noninvasive. A tenant/resident education and outreach program would be used to encourage tenants/residents not to plant exotic grasses or other plants whose seeds may potentially migrate off their properties via wind, rain, or animals.

Based on the evaluation of the changes in loads and concentrations in Project discharges to the Ballona Wetlands, the comparison of modeled constituents to water quality benchmarks, and the assessment of 303(d)-listed parameters (including the trash TMDL), the Proposed Project would not cause regulatory standards to be violated as defined in the applicable NPDES Permit (MS4 Permit) or Basin Plan. By meeting these regulatory standards, the Proposed Project is not expected to create pollution, contamination, or nuisance as defined in Section 13050 of the CWC

Table 51

REPRESENTATIVE STORMWATER CONCENTRATIONS TO THE BALLONA WETLANDS FROM THE FRESHWATER MARSH COMPARED TO WATER QUALITY BENCHMARKS*

Parameter	Water Quality Benchmarks	Predicted Concentration
Total Phosphorus (TP), (mg/L) [a]	0.2	0.13
Total Kjeldahl Nitrogen (TKN), (mg/L) [a]	1.5	0.84
Total Suspended Solids (TSS), (mg/L) [b]	60	11.3
Oil and Grease (O&G), (mg/L) [b]	25	0.90

mg/L = milligrams per liter

* *The water quality benchmarks apply to receiving waters – not directly to discharges to those receiving waters. Thus the water quality benchmarks is not directly applicable to the Wetlands. A comparison of the water quality benchmarks is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

[a] *U.S. EPA, 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion III. EPA 822-B-00-016.*

[b] *SWRCB, 2001. California Ocean Plan: Water Quality Control Plan Ocean Waters of California.*

Source: GeoSyntec Consultants

in the Ballona Wetlands. A less-than-significant impact to the Ballona Wetlands is expected to occur as a result of the Proposed Project in these respects.

3.4.1.2.7 Freshwater Wetlands System

The Freshwater Wetlands System includes a constructed wetland and a riparian corridor designed to receive and improve the quality of stormwater from the adjacent Playa Vista First Phase Project and the Proposed Project, as well as large off-site areas. At inlets to the Freshwater Marsh, there are shallow and wide "primary management areas" that effectively divide the Marsh into a multi-celled wetland-pond system. The wide areas serve to slow flows down, allow settling, and maximize contact with vegetation and wetland soils. The previous Playa Vista First Phase Project EIR model has been adapted to estimate the effects of the Marsh primary management areas on water quality prior to flows reaching the main parts of the Freshwater Marsh. This was done in order to better assess the potential impacts to water quality within the Marsh itself. It is estimated that about 50 percent of the water quality improvements would occur in the primary management areas. This is probably a conservative assumption in that wetland and detention basin studies have shown that large portions of the pollutants in a marsh settle out within a short distance from the point of inflow.[226]

3.4.1.2.7.1 Freshwater Marsh

The pollutant loading model predicts average annual stormwater loads, concentrations, and flow volumes to each of the Freshwater Marsh primary management areas. The Freshwater Marsh contains three primary management areas: the Jefferson Storm Drain primary management area, the Central Storm Drain primary management area, and the Riparian Corridor/Lincoln Storm Drain South primary management area. For comparison purposes, the pre-First Phase influent loads and concentrations to the primary management areas were assumed equal to the effluent loads and concentrations of the respective storm drains/channels. The predicted loads and concentrations in the primary management areas of the Freshwater Marsh were predicted by conservatively assuming a mixing rate of 3 parts inflow to 1 part outflow.[227] Since the Marsh was not constructed prior to the adjacent Playa Vista First Phase Project, the loads and concentrations in the primary management areas are not included in the comparison to pre-First Phase conditions, but they are included and compared to CTR criteria and other water quality benchmarks for the Proposed Project (see Table 57 on page 496 and Table 59 on page 499). The predicted loads and concentrations from pre-First Phase, with Playa Vista First Phase Project, and with the Proposed Project for each of the three primary management areas are presented in Table 52, Table 53, and Table 54 on pages 491, 492, and 493, respectively.

Comparing the Playa Vista First Phase Project to the Proposed Project, Table 52 on page 491 shows that there is no increase in loads or concentrations for all of the modeled parameters in the effluent of the Jefferson Storm Drain. The primary reason for the no-increase is that the Proposed Project includes only about one-half of an acre of new development in the Jefferson Storm Drain watershed.

Table 53 on page 492 shows the changes in loads and concentrations in the Central Storm Drain just upstream of where it enters the Freshwater Marsh. No flows are in the Central Storm Drain during pre-First Phase, as the drain was constructed as part of the adjacent Playa Vista First Phase. The increase in loads for all parameters except TSS from with Playa Vista First

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[226] *Horner, R. R., The Puget Sound Wetlands and Stormwater Management Research Program: Program Overview and Hydrology and Water Quality Studies. In Development of Guidance for Managing Urban Wetland and Stormwater. Final Report. May 1991. Report to Washington State Department of Ecology, Coastal Zone Management Program, by King County Resources Planning Section, Seattle, Washington Measure, K. and W. Fish, 1989. Behavior of Runoff-Derived Metals in a Detention Pond System. Water, Air, and Soil Pollution, 47:125-138.*

[227] *The actual mixing rates depend on the inflow velocities, the volume of water in the Freshwater Marsh at the onset of a storm, and the physical characteristics of each primary management area.*

Table 52

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE JEFFERSON STORM DRAIN PRIMARY MANAGEMENT AREA

	Predicted Average Loads [a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase [b]	59,399	117	794	706	9.6	4.5	4.1	1.9	79.3	47.2	7,500
With Playa Vista First Phase Project	38,062	127	863	880	10.4	4.8	4.5	2.0	89.4	53.2	6,987
With Proposed Project [c]	38,058	127	863	880	10.4	4.8	4.5	2.0	89.4	53.2	6,987
	Predicted Average Concentrations [a]										
	(mg/L)				(µg/L)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase [b]	126.9	0.25	1.70	1.51	20.6	9.6	8.7	4.0	169.3	100.8	7,500
With Playa Vista First Phase Project	87.3	0.29	1.98	2.02	23.9	11.1	10.3	4.7	204.9	121.9	6,987
With Proposed Project [c]	87.3	0.29	1.98	2.02	23.9	11.1	10.3	4.7	204.9	121.9	6,987

lbs/yr = pounds per year
µg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding.*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1).*
[c] *Which also includes the adjacent Playa Vista First Phase Project (i.e., Playa Vista Project Buildout).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

Phase Project to with Proposed Project is due to approximately 30 acres of the Riparian Corridor tributary area being routed to the Central Storm Drain after the Proposed Project. The decreases in concentrations for all of the parameters are due to the substantial amount of on-site treatment planned for the Proposed Project such as roof drain planter boxes and catch basin inserts.

Table 54 on page 493 shows the changes in predicted loads and concentrations in the Riparian Corridor/Lincoln Storm Drain South just upstream of the Freshwater Marsh. Under pre-First Phase conditions, the Riparian Corridor is not yet constructed; therefore, for comparison, the loads and concentrations are estimated from the sum of the effluent of the Centinela Ditch and the Lincoln Storm Drain South. For these discharges, there are substantial decreases in all of the pollutant loads and concentrations with implementation of the Proposed Project as compared to pre-First Phase conditions. The decrease from pre-First Phase to with Playa Vista First Phase is primarily due to the substantial water quality benefits of the Riparian Corridor as compared to the Centinela Ditch. The decrease in concentrations are due to the

Table 53

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE CENTRAL STORM DRAIN PRIMARY MANAGEMENT AREA

	Predicted Average Loads [a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase (Central Drain nonexistent) [b]	0	0	0	0	0	0	0	0	0	0	0
With Playa Vista First Phase Project	16,639	68	520	447	4.5	2.1	2.2	1.0	31.6	18.8	4,019
With Proposed Project [c]	15,444	96	745	610	5.7	2.7	2.7	1.2	40.6	24.1	5,798
	Predicted Average Concentrations [a]										
	(mg/L)				(µg/L)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase (Central Drain nonexistent) [b]	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
With Playa Vista First Phase Project	66.3	0.27	2.07	1.78	17.9	8.3	8.6	3.9	125.9	74.9	4,019
With Proposed Project [c]	42.7	0.27	2.06	1.68	15.8	7.3	7.4	3.4	112.1	66.7	5,798

lbs/yr = pounds per year
µg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3 of the Water Resources Technical Report, (Appendix F-1).*
[c] *Which also includes the adjacent Playa Vista First Phase Project (i.e., Playa Vista Project Buildout).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

substantial amount of on-site treatment planned for the Proposed Project, such as a vegetated swale located within a park adjacent to the Riparian Corridor. Not much change is predicted in the loads or concentrations from Playa Vista First Phase Project to Proposed Project.

Representative loads and concentrations in the main body of the Freshwater Marsh are expected to be substantially better than the concentrations existing in the storm drains and Riparian Corridor at points just upstream of the Freshwater Marsh, as shown in Table 55 on page 494. Under pre-First Phase conditions, the Freshwater Marsh was not yet constructed; therefore,

Table 54

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE RIPARIAN CORRIDOR/LINCOLN STORM DRAIN SOUTH PRIMARY MANAGEMENT AREA

	Predicted Average Loads [a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase (sum of Centinela Ditch and Lincoln Drain) [b]	67,384	239	1,439	1,671	15.7	8.5	9.6	4.4	124.4	44.4	13,006
With Playa Vista First Phase Project	22,965	229	1,294	1,138	10.1	7.8	7.4	3.4	114.1	33.5	13,534
With Proposed Project [c]	22,941	229	1,292	1,136	10.1	7.8	7.4	3.4	114.0	33.5	13,519
	Predicted Average Concentrations [a]										
	(mg/L)				(µg/L)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase (sum of Centinela Ditch and Lincoln Drain) [b]	83.0	0.29	1.77	2.06	19.4	10.5	11.8	5.4	153.3	54.7	13,006
With Playa Vista First Phase Project	27.2	0.27	1.53	1.35	11.9	9.2	8.8	4.0	135.0	39.7	13,534
With Proposed Project [c]	27.2	0.27	1.53	1.35	11.9	9.2	8.8	4.0	135.0	39.7	13,519

lbs/yr = pounds per year
10^3 ft^3/yr =one thousand cubic feet per year
mg/L = milligrams per liter
µg/L = micrograms per liter
TSS = Total Suspended Solids
TP = Total Phosphorus
TKN = Total Kjeldahl Nitrogen
O&G = Oil and Grease
TCu = Total Copper
DCu = Dissolved Copper
TPb = Total Lead
DPb = Dissolved Lead
TZn = Total Zinc
DZn = Dissolved Zinc

[a] *Subtotals and totals were calculated prior to rounding.*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1).*
[c] *Which also includes the adjacent Playa Vista First Phase Project (i.e., Playa Vista Project Buildout).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

for comparison purposes, the loads for the pre-First Phase Project conditions are equivalent to the sum of the loads from each of the future contributing storm drains/channels (i.e., Jefferson Storm Drain, Lincoln Storm Drain South, and Centinela Ditch).

As compared to pre-First Phase, the concentrations of all of the modeled parameters and most loads (except dissolved lead) are also expected to decrease with implementation of the adjacent Playa Vista First Phase Project and the Proposed Project. Predicted changes in loads and concentrations are attributable to the changes to existing land uses and the improvement in stormwater quality on-site, in the water quality inlets, the Riparian Corridor, and the primary management areas of the Freshwater Marsh. The area occupied by the current Freshwater Marsh prior to its construction received both on- and off-site runoff and associated pollutants. With

Table 55

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE MAIN BODY OF THE FRESHWATER MARSH NEAR THE PRIMARY MANAGEMENT AREAS

	Predicted Average Loads [a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase (sum of future contributing drainages) [b]	71,883	241	1,459	1,671	15.9	8.6	9.7	4.4	124.9	44.7	13,329
With Playa Vista First Phase Project	49,240	317	2,000	1,939	17.3	11.04	10.6	5.3	134.1	58.8	25,100
With Proposed Project [c]	49,251	338	2,158	2,069	18.2	11.6	11.1	5.6	139.7	61.8	26,863
	Predicted Average Concentrations [a]										
	(mg/L)				**(µg/L)**						**Volume**
	TSS	**TP**	**TKN**	**O&G**	**TCu**	**DCu**	**TPb**	**DPb**	**TZn**	**DZn**	**(10^3 ft^3/year)**
Pre-First Phase (sum of future contributing drainages) [b]	86.4	0.29	1.75	2.01	19.1	10.3	11.6	5.3	150.1	53.7	13,329
With Playa Vista First Phase Project	31.4	0.20	1.28	1.24	11.0	7.0	6.8	3.4	85.6	37.5	25,100
With Proposed Project [c]	29.4	0.20	1.29	1.23	10.9	6.9	6.6	3.3	83.3	36.9	26,863

lbs/yr = pounds per year
µg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1). Sum of future contributing drainages includes Jefferson Storm Drain, Centinela Ditch, Lincoln Storm Drain and off-site tributary areas.*
[c] *Which also includes the adjacent Playa Vista First Phase Project (i.e., Playa Vista Project Buildout).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

implementation of the Proposed Project, a larger amount of impervious area would increase runoff that would be routed to the Freshwater Marsh, contributing to the larger annual total runoff volume. The conversion of undeveloped areas to commercial and residential land uses tends to decrease the amount of suspended solids associated with upland erosion, and tends to increase the amount of lead associated with urban activities.

Table 56 on page 495 shows a breakdown of the concentrations into and out of the Freshwater Wetlands System after completion of the adjacent Playa Vista First Phase Project and the Proposed Project. (See Volume I, Section 3 of the Water Resources Technical Report,

Table 56

REPRESENTATIVE STORMWATER CONCENTRATIONS TO THE FRESHWATER WETLANDS SYSTEM WITH PLAYA VISTA FIRST PHASE AND PROPOSED PROJECT

	Predicted Average Concentrations									
	(mg/L)				(µg/L)					
	TSS	TP	TKN	O&G	Tcu	DCu	TPb	DPb	TZn	DZn
Riparian Corridor at Lincoln [a]	24.9	0.27	1.5	1.3	11.4	9.9	9.6	4.4	140.6	35.2
Central Storm Drain [a]	42.7	0.27	2.1	1.7	15.8	7.3	7.4	3.4	112.1	66.7
Jefferson Storm Drain [a]	87.2	0.29	2.0	2.0	23.9	11.1	10.3	4.7	204.7	121.8
Lincoln Storm Drain – South	42.4	0.26	1.8	1.7	15.5	7.2	4.6	2.1	115.9	69.0
Direct runoff to Freshwater Marsh	88.9	0.05	0.4	0.1	4.1	1.9	1.3	0.6	11.9	7.1
Main Body of the Freshwater Marsh	**29.4**	**0.20**	**1.3**	**1.2**	**10.9**	**6.9**	**6.6**	**3.3**	**83.3**	**36.9**
Freshwater Marsh Effluent	**11.3**	**0.13**	**0.8**	**0.9**	**6.02**	**4.66**	**4.59**	**2.68**	**20.89**	**7.53**

WQ = Water Quality
mg/L = milligrams per liter | *µg/L = micrograms per liter* | *TSS = Total Suspended Solids*
TP = Total Phosphorus | *TKN = Total Kjeldahl Nitrogen* | *O&G = Oil and Grease*
TCu = Total Copper | *DCu = Dissolved Copper* | *TPb = Total Lead*
DPb = Dissolved Lead | *TZn = Total Zinc* | *DZn = Dissolved Zinc*

[a] These concentrations assume treatment from the on-site treatment controls (catch basin inserts, vegetated swales, and roof-drain planter boxes).

Source: GeoSyntec Consultants

Appendix F-1, for the average concentrations that relate to the pre-First Phase and with Playa Vista First Phase Project.) The Jefferson Storm Drain, which receives 83 percent of its runoff from off-site tributary areas, contributes the highest runoff concentrations to the Freshwater Marsh.

Comparisons of modeled stormwater quality in the primary management areas of the Freshwater Marsh to water quality benchmarks (acute CTR criteria) for metals for single storm events are shown in Table 57 and Table 58 on pages 496 and 497. Table 57 on page 496 shows that the predicted concentrations in the primary management areas of the main body of the Marsh are all well below the dissolved metals CTR criteria. Stormwater in the Riparian Corridor/Lincoln Storm Drain South, with the upstream Riparian Corridor treatment, and the Central Storm Drain, primary management areas are not predicted to contain concentrations greater than acute CTR.

Table 57

REPRESENTATIVE STORMWATER DISSOLVED METALS CONCENTRATIONS IN THE FRESHWATER MARSH PRIMARY MANAGEMENT AREAS COMPARED TO CTR CRITERIA*

Jefferson Storm Drain Primary Management Area (Hardness = 200 mg/L)

Parameter	Acute CTR (µg/L) [a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	26	10.4
Dissolved Lead (DPb)	136	4.5
Dissolved Zinc (DZn)	210	108.4

Central Storm Drain Primary Management Area (Hardness = 200 mg/L)

Parameter	Acute CTR (µg/L) [a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	26	6.9
Dissolved Lead (DPb)	136	3.2
Dissolved Zinc (DZn)	210	59.3

Riparian Corridor/Lincoln Storm Drain South Primary Management Area (Hardness = 200 mg/L)

Parameter	Acute CTR (µg/L) [a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	26	8.6
Dissolved Lead (DPb)	136	3.9
Dissolved Zinc (DZn)	210	35.3

Main Body of Marsh (Hardness = 300 mg/L)

Parameter	Acute CTR (µg/L) [a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	38	6.9
Dissolved Lead (DPb)	208	3.3
Dissolved Zinc (DZn)	297	36.9

mg/L = milligrams per liter
µg/L = micrograms per liter
CTR = California Toxics Rule

* *The CTR does not apply directly to stormwater but, rather, to the receiving waters to which the stormwater discharges. A comparison of the CTR to the stormwater flows is conservative because it does not account for assimilation that may occur once the stormwater enters the receiving water.*

[a] *Final Freshwater CTR Criteria – May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards. The hardness concentrations used to calculate the CTR criteria are discussed further in Section 3.2.4.2.3.1 of Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1)*

Source: GeoSyntec Consultants

Table 58

REPRESENTATIVE STORMWATER CONCENTRATIONS IN THE MAIN BODY OF THE FRESHWATER MARSH COMPARED TO NUTRIENT WATER QUALITY BENCHMARKS*

Parameter	Water Quality Benchmark [a]	Predicted Concentration
Jefferson Storm Drain Primary Management Area		
Total Phosphorus (TP), (mg/L)	2.8	0.3
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	1.8
Central Storm Drain Primary Management Area		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Phosphorus (TP), (mg/L)	2.8	0.3
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	1.9
Riparian Corridor/Lincoln Storm Drain South Primary Management Area		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Phosphorus (TP), (mg/L)	2.8	0.3
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	1.4
Main Body of Marsh		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Phosphorus (TP), (mg/L)	2.8	0.2
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	1.3

mg/L = milligrams per liter

* *The Water Quality benchmarks apply to receiving waters – not directly to discharges to those receiving waters. Thus the water quality benchmarks are not directly applicable to the Freshwater Marsh. A comparison of the water quality benchmarks is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

[a] *U.S. EPA, 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion III. EPA 822-B-00-016*

Source: GeoSyntec Consultants

Table 58 provides a comparison of the nutrient water quality benchmarks. As shown in Table 58, all of the concentrations discharged to the Freshwater Marsh are predicted to be below the benchmarks. However, these benchmarks are very conservative, particularly for the Freshwater Marsh and discharges to the Ballona Wetlands, which could actually benefit from nutrient loading by promoting aquatic plant growth and benthic community activities.[228] The nutrient water quality benchmarks were chosen for comparison purposes only as numeric water quality standards for the modeled nutrients. They are not intended to represent distinct thresholds of significant impact to receiving waters, but rather are used as an assessment tool of the approximate levels of concern for waters that have not been impacted by human activities and are protective of beneficial uses, and only if substantially exceeded might an impact be

[228] *Kadlec, R. H. and R. L. Knight, Treatment Wetlands. CRC Press LLC, Boca Raton, FL, 1996.*

considered significant. By meeting these benchmarks on an annual average basis, the impact assessment concludes that the Proposed Project would not impact receiving waters with respect to TKN and total phosphorus.

The Basin Plan contains narrative water quality objectives for biostimulatory substances. Nutrients such as phosphorus and nitrogen are required by aquatic organisms for growth; however, in excess, these nutrients can "overstimulate" aquatic growth leading to degradation of water quality. Since the nutrient water quality benchmarks are based on streams that have not been heavily impacted and are protective of beneficial uses, meeting these thresholds also complies with the Basin Plan water quality objectives for biostimulatory substances.

Table 59 on page 499 provides a comparison of the TSS and oil and grease water quality benchmarks. The table shows that no benchmark exceedances will occur in the primary management areas or the main body of the Freshwater Marsh except for TSS in the Jefferson Storm Drain primary management area. However, the primary management areas are specifically designed as vegetated, shallow water areas to slow flow velocities and capture particulates. Also, the TSS benchmark is only legally applicable to publicly owned treatment works and industrial dischargers, in each case, that discharge directly to the ocean; it is used here for reference due to the lack of applicable numeric water quality standards for TSS. The higher TSS concentration predicted for the Jefferson Storm Drain primary management area is indicative of the amount of off-site areas not receiving treatment in biofilters and catch basin inserts, such as those included in the adjacent Playa Vista First Phase Project and Proposed Project. The Jefferson Storm Drain receives less than 1 percent of its runoff from the Proposed Project and less than 17 percent of its runoff from the adjacent Playa Vista First Phase Project. The remaining 83 percent of runoff is primarily from off-site residential, industrial, and transportation land uses.

For all three primary management areas, as well as the main body of the Freshwater Marsh, the concentrations are predicted to remain unchanged or decrease with implementation of the Proposed Project as compared to with the adjacent Playa Vista First Phase Project. Only for the Central Storm Drain primary management area are loads predicted to increase for some parameters between the Playa Vista First Phase Project and Proposed Project. The increases in loads for the Central Storm Drain primary management area, and consequently the main body of the Freshwater Marsh, are attributable to approximately 30 acres of the Riparian Corridor tributary area being routed to the Central Storm Drain after the Proposed Project. Due to a significant amount of on-site controls, such as roof-drain planter boxes and catch basin inserts, planned as part of the Proposed Project, the increases are much less than would occur without on-site controls.

The Freshwater Wetlands System was specifically designed to manage increases in runoff and associated pollutant loads and concentrations with implementation of the Proposed

Table 59

REPRESENTATIVE STORMWATER CONCENTRATIONS IN THE MAIN BODY AND IN THE EFFLUENT OF THE FRESHWATER MARSH COMPARED TO WATER QUALITY BENCHMARKS*

	Jefferson Storm Drain Primary Management Area	
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Suspended Solids (TSS), (mg/L)	60	79
Oil and Grease (O&G), (mg/L)	25	1.9
	Central Storm Drain Primary Management Area	
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Suspended Solids (TSS), (mg/L)	60	38
Oil and Grease (O&G), (mg/L)	25	1.6
	Riparian Corridor/Lincoln Storm Drain South Primary Management Area	
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Suspended Solids (TSS), (mg/L)	60	25
Oil and Grease (O&G), (mg/L)	25	1.3
	Main Body of Marsh	
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Suspended Solids (TSS), (mg/L)	60	29
Oil and Grease (O&G), (mg/L)	25	1.2

mg/L = milligrams per liter

* *The Water Quality benchmarks apply to receiving waters – not directly to discharges to those receiving waters. Thus the water quality benchmarks are not directly applicable to the Freshwater Marsh. A comparison of the water quality benchmarks is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

[a] *SWRCB, 2001. California Ocean Plan: Water Quality Control Plan Ocean Waters of California.*

Source: GeoSyntec Consultants

Project. Since concentrations of all modeled pollutants (chosen because they are typical of urban stormwater parameters as discussed in Subsection 3.1.1) are not predicted to increase in the Freshwater Marsh, and increases in loads are insignificant with respect to the anticipated functionality of the Freshwater Wetlands System, it is not anticipated that the Proposed Project would create pollution, contamination, or nuisance as defined in Section 13050 of the CWC associated with the modeled pollutants. In addition, the influent concentrations into the Ballona Channel do not cause regulatory standards to be violated as defined in the applicable NPDES Permit (MS4 Permit) or Basin Plan and in turn would not create pollution, contamination, or nuisance as defined in Section 13050 of the CWC. Therefore, slightly elevated loads within the Freshwater Marsh, including the primary management areas, are considered less than significant.

The predicted concentrations in all of the primary management areas are well below the CTR criteria. For all of the non-regulatory benchmarks, only the Jefferson Storm Drain primary management area exceeds the TSS benchmark, and this exceedance is associated with the existing runoff from off-site areas within the Jefferson Storm Drain watershed rather than runoff from the Proposed Project. Therefore, the Proposed Project would not contribute to this potential exceedance, and no significant impact is anticipated with respect to the modeled water quality parameters.

Since the Freshwater Wetlands System was designed to manage increases in runoff and to specifically employ the primary management areas for controlling urban pollution, it is not anticipated that the Proposed Project would create pollution, contamination, or nuisance as defined in Section 13050 of the CWC. Also, the predicted concentrations in the main body of the Freshwater Marsh, as well as the primary management areas receiving the majority of runoff from off-site areas, do not exceed CTR criteria, and do not cause regulatory standards to be violated as defined or referenced in the applicable NPDES Permit (MS4 Permit) or Basin Plan. Therefore, impacts to the Freshwater Marsh are considered less than significant in these respects.

3.4.1.2.7.2 Riparian Corridor

Discharges to the Riparian Corridor occur at several locations along its length and includes runoff from off-site areas, as well as the adjacent Playa Vista First Phase Project, and the Proposed Project. Prior to the construction of the Riparian Corridor (which will replace the Centinela Ditch), the Centinela Ditch will continue to receive all of the runoff from these areas. In fact, with the implementation of the Proposed Project the runoff area tributary to the Riparian Corridor would decrease by nearly 30 acres as compared to the Playa Vista First Phase Project due to routing of Project area runoff to the Central Storm Drain. Table 60 on page 501 and Table 61 on page 502 show the changes in loads and concentrations in the Riparian Corridor (Centinela Ditch for pre-First Phase) at the downstream Proposed Project boundary and at Lincoln Boulevard, respectively. Notice that in both tables all of the loads and concentrations with the Proposed Project are predicted to decrease compared to pre-First Phase conditions, and are predicted to either decrease slightly or remain unchanged compared to the Playa Vista First Phase Project.

Table 62 on page 503 summarizes the contributing runoff concentrations of the modeled parameters to the Riparian Corridor. (See Volume I, Section 3 of the Water Resources Technical Report, Appendix F-1, for the average concentrations that relate to the pre-First Phase and with Playa Vista First Phase Project.)

Table 63 on page 504 compares the predicted concentrations in and to the Riparian Corridor to acute CTR criteria. Table 64 on page 505 and Table 65 on page 506 compare the predicted influent concentrations, as well as the in-stream concentrations of the Riparian Corridor to the water quality benchmarks.

Table 60

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS IN THE RIPARIAN CORRIDOR/CENTINELA DITCH AT PROPOSED PROJECT BOUNDARY

	Predicted Average Loads[a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase[b]	47,639	178	1,000	1,293	11.5	6.6	7.9	3.6	96.3	29.8	9,095
With Playa Vista First Phase Project	13,372	150	800	699	6.1	5.3	5.1	2.4	75.6	18.9	8,611
With Proposed Project[c]	13,349	149	799	698	6.1	5.3	5.1	2.4	75.4	18.9	8,596
	Predicted Average Concentrations[a]										
	(mg/L)				**(µg/L)**						**Volume**
	TSS	**TP**	**TKN**	**O&G**	**TCu**	**DCu**	**TPb**	**DPb**	**TZn**	**DZn**	**(10^3 ft^3/year)**
Pre-First Phase[b]	83.9	0.3	1.8	2.3	20.3	11.6	13.9	6.3	169.5	52.5	9,095
With Playa Vista First Phase Project	24.9	0.3	1.5	1.3	11.4	9.9	9.6	4.4	140.6	35.2	8,611
With Proposed Project[c]	24.9	0.3	1.5	1.3	11.4	9.9	9.6	4.4	140.6	35.2	8,596

lbs/yr = pounds per year
µg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr = one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3, of the Water Resources Technical Report (Appendix F-1).*
[c] *Which also includes the adjacent Playa Vista First Phase Project (i.e., Playa Vista Project Buildout).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants.

None of the benchmarks are exceeded except for TSS in the influent to the Riparian Corridor. This exceedance is just slightly above the conservative TSS benchmark of 60 mg/L, and as shown in Table 65 on page 506 the concentrations in the Riparian Corridor, due to the natural treatment processes of sedimentation and biofiltration, are predicted to be 25 mg/L just downstream from the Proposed Project boundary. The Riparian Corridor was specifically designed to treat urban runoff containing suspended sediment and the O&M Manual includes measures for removing captured sediment in the Riparian Corridor when the average sediment depth exceeds 10 percent of its design depth.

The Riparian Corridor was specifically designed to provide enhanced treatment of First Phase and Proposed Project runoff, as well as a significant amount of off-site area runoff prior to reaching the Freshwater Marsh. Nevertheless, flows within the Riparian Corridor still meets all

Table 61

REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS IN THE RIPARIAN CORRIDOR/CENTINELA DITCH AT LINCOLN BOULEVARD

	Predicted Average Loads [a]										Volume
	(lbs/yr)				(lbs/yr)						(10^3 ft^3/year)
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	
Pre-First Phase [b]	62,718	211	1,239	1,494	14.1	7.8	9.1	4.2	111.9	36.9	11,261
With Playa Vista First Phase Project	18,256	200	1,092	954	8.4	7.0	6.9	3.2	101.2	25.9	11,756
With Proposed Project [c]	18,232	200	1,091	953	8.4	7.0	6.9	3.2	101.1	25.8	11,741
	Predicted Average Concentrations [a]										**Volume**
	(mg/L)				(µg/L)						(10^3 ft^3/year)
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	
Pre-First Phase [b]	89.2	0.3	1.8	2.1	20.0	11.0	12.9	5.9	159.2	52.5	11,261
With Playa Vista First Phase Project	24.9	0.3	1.5	1.3	11.4	9.5	9.4	4.3	137.9	35.2	11,756
With Proposed Project [c]	24.9	0.3	1.5	1.3	11.4	9.5	9.4	4.3	137.9	35.2	11,741

lbs/yr = pounds per year
µg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding.*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I., Section 3 of the Water Resources Technical Report(Appendix F-1).*
[c] *Which also includes the adjacent Playa Vista First Phase Project (i.e., Playa Vista Project Buildout).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

of the in-stream water quality benchmarks used to assess potential impacts to receiving waters, so it is not anticipated that the Proposed Project would create pollution, contamination, or nuisance as defined in Section 13050 of the CWC in the Riparian Corridor, or cause any of the numerical or narrative regulatory standards to be violated as defined or referenced in the applicable NPDES Permit (MS4 Permit) or Basin Plan. Therefore, impacts to the Riparian Corridor are considered less than significant in these respects.

3.4.1.2.8 Conformance with Performance Criteria

As described above in Subsection 2.1.1.4, the Performance Criteria are site-specific regulatory requirements established for the adjacent Playa Vista First Phase Project and the Proposed Project by the regulatory agencies that permitted and approved the Freshwater

Table 62

REPRESENTATIVE STORMWATER CONCENTRATIONS TO AND WITHIN THE RIPARIAN CORRIDOR WITH PLAYA VISTA FIRST PHASE AND PROPOSED PROJECT

	Predicted Average Concentrations									
	(mg/L)				(μg/L)					
	TSS	**TP**	**TKN**	**O&G**	**TCu**	**DCu**	**TPb**	**DPb**	**TZn**	**DZn**
Riparian Corridor Influent (after WQ Inlets) Upstream of West Boundary of Project	66.1	0.31	2.4	2.2	23.4	10.9	12.9	5.9	160.0	95.2
Riparian Corridor at Proposed Project Boundary	24.9	0.3	1.5	1.3	11.4	9.9	9.6	4.4	140.6	35.2
Riparian Corridor Influent (after WQ Inlets) Downstream of West Boundary of Project	53.6	0.3	2.0	1.7	18.0	8.3	9.0	4.1	130.7	77.8
Riparian Corridor at Lincoln	24.9	0.3	1.5	1.3	11.4	9.5	9.4	4.3	137.9	35.2

WQ = Water Quality
mg/L = milligrams per liter *μg/L = micrograms per liter* *TSS = Total Suspended Solids*
TP = Total Phosphorus *TKN = Total Kjeldahl Nitrogen* *O&G = Oil and Grease*
TCu = Total Copper *DCu = Dissolved Copper* *TPb = Total Lead*
DPb = Dissolved Lead *TZn = Total Zinc* *DZn = Dissolved Zinc*

[a] *These concentrations assume treatment from the water quality inlets (catch basin inserts).*

Source: GeoSyntec Consultants

Wetlands System as well as by agreements resulting from litigation (404 Permit, 401 Certification, CCC Certification, CDP, and HMMP). As is detailed in the source documents establishing the Performance Criteria, the requirements relate to the three goals of the Freshwater Wetlands System: (1) water quality improvement; (2) flood control capacity; and (3) establishment and enhancement of habitat. In general, the Performance Criteria discuss requirements applicable to the design of the Freshwater Wetlands System, criteria applicable to the interim habitat-establishment period and at final buildout of the Freshwater Wetlands System, and monitoring and reporting requirements.

As not all portions of the Freshwater Wetlands System have been constructed, the final buildout-related Performance Criteria relate to conditions several years from now. With regard to "pre-final" Performance Criteria, including monitoring and reporting requirements, the primary document discussing compliance with these criteria is The Ballona Freshwater Wetland

Table 63

REPRESENTATIVE STORMWATER DISSOLVED METALS CONCENTRATIONS IN AND TO THE RIPARIAN CORRIDOR COMPARED TO CTR CRITERIA *

Total Inflows to Riparian Corridor Upstream of West Boundary of Proposed Project (Hardness = 200 mg/L)

Parameter	Acute CTR (µg/L)[a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	26	10.9
Dissolved Lead (DPb)	136	5.9
Dissolved Zinc (DZn)	210	95.2

Total Inflows to Riparian Corridor Downstream of West Boundary of Proposed Project (Hardness = 200 mg/L)

Parameter	Acute CTR (µg/L)[a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	26	8.3
Dissolved Lead (DPb)	136	4.1
Dissolved Zinc (DZn)	210	77.8

Riparian Corridor at West Boundary of Proposed Project (Hardness = 200 mg/L)

Parameter	Acute CTR (µg/L)[a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	26	9.9
Dissolved Lead (DPb)	136	4.4
Dissolved Zinc (DZn)	210	35.2

Riparian Corridor at Lincoln Blvd (Hardness = 200 mg/L)

Parameter	Acute CTR (µg/L)[a]	Predicted Concentration (µg/L)
Dissolved Copper (DCu)	26	9.5
Dissolved Lead (DPb)	136	4.3
Dissolved Zinc (DZn)	210	35.2

mg/L = milligrams per liter *µg/L = micrograms per liter* *CTR = California Toxics Rule*

* *The CTR does not apply directly to stormwater inflows but, rather, to receiving waters with certain designated beneficial uses to which stormwater discharges. A comparison of the CTR to the stormwater flows is conservative because it does not account for assimilation that may occur once the stormwater enters the receiving water.*

[a] *Final CTR Criteria – May 18, 2000. Federal Register Volume 65, No. 97, 40 CFR Part 131, Water Quality Standards. The hardness concentrations used to calculate the CTR criteria are based upon weather sampling in the Centinela Ditch on April 17, 2000, where hardness was measured at 210 mg/L as $CaCO_3$. This value is considered conservative because the Riparian Corridor, which replaces the Centinela Ditch, will be a wetland-type waterbody, and such waterbodies typically develop higher hardness concentrations than other types of freshwater bodies.*

Source: GeoSyntec Consultants.

System Operations, Maintenance and Monitoring Manual (O&M Manual).[229] The O&M Manual describes the Freshwater Wetlands System goals, administration, operations and maintenance requirements (including timelines, task lists, and checklists), and monitoring and reporting

[229] *Surface Water Resources, Inc., The Ballona Freshwater Wetland System Operations, Maintenance and Monitoring Manual, October 2001(as amended).*

Table 64

REPRESENTATIVE STORMWATER CONCENTRATIONS TO AND IN THE RIPARIAN CORRIDOR COMPARED TO NUTRIENT WATER QUALITY BENCHMARKS*

Parameter	Water Quality Benchmark [a]	Predicted Concentration
Total Inflows to Riparian Corridor Upstream of West Boundary of Proposed Project		
Total Phosphorus (TP), (mg/L)	2.8	0.3
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	2.4
Total Inflows to Riparian Corridor Downstream of West Boundary of Proposed Project		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Phosphorus (TP), (mg/L)	2.8	0.3
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	2.0
Riparian Corridor at West Boundary of Proposed Project		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Phosphorus (TP), (mg/L)	2.8	0.3
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	1.5
Riparian Corridor at Lincoln Blvd		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Phosphorus (TP), (mg/L)	2.8	0.3
Total Kjeldahl Nitrogen (TKN), (mg/L)	3.3	1.5

mg/L = milligrams per liter

* *The Water Quality benchmarks apply to receiving waters – not directly to discharges to those receiving waters. Thus the water quality benchmarks are not directly applicable to the Riparian Corridor. A comparison of the water quality benchmarks is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

Source: GeoSyntec Consultants

procedures. Through implementation of the O&M Manual, Performance Criteria are being met. Verifications of Performance Criteria related to particular water quality thresholds is documented through examination of the annual reports required by the Performance Criteria to be submitted to the USACE, the CCC, the California Department of Fish and Game, the RWQCB, the City of Los Angeles, and the Los Angeles County West Vector Control District.

With respect to water quality performance, the analysis presented above demonstrates that: (1) the water quality within the Freshwater Wetlands System will support the habitat required to be created and maintained therein; and (2) the Proposed Project will not materially affect the attainment of the specified habitat values. Further, the Proposed Project, on its own as well as in combination with the adjacent Playa Vista First Phase Project, will not significantly adversely impact water quality in Santa Monica Bay, the Ballona Wetlands, or the Ballona Creek Estuary, which conclusion is consistent with the goals for which the agencies issued their approvals for the Freshwater Wetlands System and established the Performance Criteria.

Table 65

REPRESENTATIVE STORMWATER CONCENTRATIONS TO AND IN THE RIPARIAN CORRIDOR COMPARED TO WATER QUALITY BENCHMARKS*

Parameter	Water Quality Benchmark [a]	Predicted Concentration
Total Inflows to Riparian Corridor Upstream of West Boundary of Proposed Project		
Total Suspended Solids (TSS), (mg/L)	60	66
Oil and Grease (O&G), (mg/L)	25	2.2
Total Inflows to Riparian Corridor Downstream of West Boundary of Proposed Project		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Suspended Solids (TSS), (mg/L)	60	54
Oil and Grease (O&G), (mg/L)	25	1.7
Riparian Corridor at West Boundary of Proposed Project		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Suspended Solids (TSS), (mg/L)	60	25
Oil and Grease (O&G), (mg/L)	25	1.3
Riparian Corridor at Lincoln Blvd		
Parameter	**Water Quality Benchmark [a]**	**Predicted Concentration**
Total Suspended Solids (TSS), (mg/L)	60	25
Oil and Grease (O&G), (mg/L)	25	1.3

mg/L = milligrams per liter

* *The Water Quality benchmarks apply to receiving waters – not directly to discharges to those receiving waters. Thus the water quality benchmarks are not directly applicable to the Riparian Corridor. A comparison of the water quality benchmarks is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

Source: GeoSyntec Consultants

3.4.1.2.9 Summary of the Surface Water Quality Impact Assessment

Potential significant impacts of the Proposed Project were assessed both numerically and narratively. In the numerical assessment, a pollutant loadings and concentrations model, developed specifically for the planned development, was used to evaluate potential changes in concentrations in stormwater runoff from pre-First Phase, with Playa Vista First Phase, and with Playa Vista First Phase and Proposed Project areas. The model was also used to compare numerical water quality benchmarks to the model-predicted pollutants (i.e., total suspended solids, total phosphorus, total Kjeldahl nitrogen, oil and grease, and dissolved and total copper, lead and zinc). The numerical impact assessment found less-than-significant increases in pollutant loadings and concentrations and no exceedances of numerical water quality benchmarks in waterbodies with designated beneficial uses, as defined in the Basin Plan.

The numerical water quality benchmarks were derived from water quality standards and objectives and guidelines, all of which are not directly applicable to stormwater discharges but provide a basis for comparisons. The CTR is applicable to surface waters with beneficial uses designated by the RWQCB as protective of human health or aquatic life, which include the Ballona Channel, the Ballona Wetlands, and Santa Monica Bay. In this assessment, potential impacts were evaluated for the receiving waters—the Ballona Channel and the Ballona Wetlands—and potential impacts to the Freshwater Wetlands System are evaluated as well. All of the other water quality benchmarks are considered conservative in that they were derived from water quality criteria or objectives that are not directly applicable to stormwater discharges or the Freshwater Wetlands System. The total suspended sediment and oil and grease water quality benchmarks were derived from the COP effluent limitations for publicly owned wastewater treatment facilities and non-regulated industrial discharges to the ocean waters of the State. These benchmarks were chosen as guidelines of the desired water quality of ocean water discharges. The nutrients' water quality benchmarks (TKN and total phosphorus) were derived from federal guidelines for establishing state and tribal water quality criteria for nutrients in rivers and streams. These guidelines are not enforceable; they are values obtained from monitoring data of streams in the region that are minimally impacted by human activities and are protective of aquatic life and recreational uses. By meeting the water quality benchmarks derived from the COP and the EPA nutrient guidance document (Nutrient Ecoregion), the potential water quality impacts of the Project with respect to these parameters is considered less than significant. The pollutant loading model, due to lack of specific source control performance data, does not take into account all of the on-site source control BMPs planned in the Proposed Project (see Figure 33 on page 455 and discussion in Subsection 3.3.1). Therefore, the actual quality of runoff from the Proposed Project is expected to be better than predicted in the model.

In addition to the Freshwater Wetlands System, the treatment control BMPs that were included in the model consist of:

1. Roof downspout planter boxes for all buildings planned for the Proposed Project in the Central Drain catchment;
2. A vegetated swale for all low-flow runoff entering the Riparian Corridor from the Proposed Project area;
3. Catch basin inserts for 100 percent of the runoff entering the Central Drain from the Proposed Project area and additional catch basin inserts for 25 percent of the runoff from other adjacent Playa Vista First Phase and Proposed Project areas;
4. A vegetated swale treating Lincoln Boulevard runoff prior to discharging to the Central Drain; and
5. A hydrodynamic solids separation device treating Lincoln Boulevard runoff prior to discharging to the Freshwater Marsh.

Some of the planned BMPs that are expected to reduce pollutant loads and concentrations in the runoff of the Proposed Project but were not included in the model include street sweeping, public education, catch basin cleaning, trash racks, underground parking, an internal transit system and a pesticide and fertilizer management program. Street sweeping, public education, catch basin cleaning, and trash racks are anticipated to reduce trash and sediment loadings, as well as contaminants associated with these bulk pollutants. Underground parking and the internal transit system are anticipated to reduce vehicular pollutants including metals. The pesticide and fertilizer management program is anticipated to reduce the amount of nutrients and toxic pollutants generated from landscaping activities.

In addition to using the pollutant loadings model for assessing numerical significance impacts, narrative significance impacts were also assessed by qualitatively discussing the Project Design Features with respect to the following:

1. Potential impacts to the Santa Monica Bay;
2. Requirements in the Los Angeles County SUSMP;
3. Characteristics and potential sources of the 303(d) listed parameters;
4. Narrative water quality objectives of the Basin Plan;
5. Stability of channels receiving stormwater runoff from the Proposed Project site;
6. Potential impacts of dry-weather (nuisance) flows from the Proposed Project site; and
7. Potential deviation from the Performance Criteria.

Considering all of the inputs to Santa Monica Bay, the quantity of stormwater runoff from the Proposed Project site is less than significant in comparison. In fact the adjacent Playa Vista First Phase Project together with the Proposed Project results in net benefits to receiving waters listed in the Basin Plan, including the Ballona Wetlands, Ballona Estuary, and Santa Monica Bay. Consequently, the potential water quality impacts to Santa Monica Bay have been qualitatively discussed and determined to be less than significant, via comparisons of Project runoff quality to pre-First Phase loads and concentrations and numerical water quality benchmarks, as well as discussions of 303(d) listed pollutants.

The stormwater treatment system and source control measures for both the adjacent Playa Vista First Phase Project and the Proposed Project were designed specifically with consideration of the local design and treatment requirements and, therefore, are consistent with requirements for stormwater management. The Project Design Features were designed to specifically exceed the requirements of the Los Angeles County SUSMP (see comparison on Table 3-22 in Volume I, Section 3 of the Water Resources Technical Report Appendix F-1). This exceedance is not only based upon the size of the treatment system, but also the treatment of significant off-site areas (more than half of the total tributary area of the Freshwater Marsh is from off-site areas) and the high effectiveness of wetland treatment systems over other less effective BMP types that are allowed under the SUSMP program.

Based on an analysis of the individual 303(d) water quality parameters listed both in the original 1998 list and the newly proposed 2002 list, the Proposed Project is not expected to increase loads or concentrations of any of these constituents in the listed waterbodies, as most of the listed pollutants are from historical sources, such as contaminated soil, or are removed by on-site BMPs and the Freshwater Wetlands System. The source control measures and the structural BMPs are expected to be effective at reducing the current loading of the 303(d) listed pollutants; resulting in an expected improvement to the water quality of stormwater runoff from the Project area and contributing off-site areas.

Several of 303(d) listed parameters for receiving waters of Project runoff affect or directly relate to the narrative objectives in the Basin Plan. These narrative objectives were qualitatively assessed and are expected to be met with the implementation of the Proposed Project.

Peak stormwater runoff discharge rates and channel stability are not considered to be a significant issue with the development of the Proposed Project. The increased runoff due to increased impervious areas would be completely contained within the stormwater treatment system, which includes energy dissipaters (e.g., water quality inserts/catch basin inserts and riprap at outlets) and extended detention in the Freshwater Wetlands System. No detrimental increases in channel velocities are expected and the Proposed Project is not expected to cause regulatory standards to be violated, as defined in the applicable NPDES Permit (MS4 Permit; per SUSMP Standards) or the Basin Plan. By not causing a condition of nuisance as defined in the Basin Plan, a nuisance is also not anticipated to be created as defined in Section 13050 of the CWC. The Ballona Wetlands will receive reduced erosive flows because of the routing of flows away from the salt marsh from all but large storm events and the flow retardation in the Freshwater Marsh. The Ballona Channel is a grouted riprap sided channel that would not be impacted by the small increase in flows caused by this Project. The small increase in flows relative to those originating upstream is not expected to create pollution, contamination or nuisance as defined in Section 13050 of the CWC.

Potential dry-weather flows from the developed areas and off-site areas would be detained longer than wet-weather flows, resulting in even greater treatment. They are being employed to help sustain the Freshwater Wetlands System and, in fact, are considered a benefit to the system. Also, conservative irrigation practices and newer sewer systems are expected to minimize dry-weather flows from the Proposed Project areas.

Compliance with the Performance Criteria is an ongoing process as construction of the Freshwater Wetlands System is completed, and as habitat is established and maintained. The O&M Manual serves as the primary vehicle, in accordance with which compliance with the Performance Criteria is taking place. The analyses presented herein above demonstrate that water quality of the Proposed Project will support the required habitat of the Freshwater Wetlands System and protect downstream receiving waters, thus satisfying the water quality aspects of the Performance Criteria and the associated permits and approvals. Verification of the water quality-related Performance Criteria will be documented through the annual reports submitted to the USACE, RWQCB, CCC, and other agencies responsible for enforcement of the Performance Criteria.

Based on the numerical and narrative impact assessment, the Proposed Project is not expected to create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC, or cause regulatory standards to be violated, as defined in the applicable NPDES Permit (MS4 Permit) or the Basin Plan, for the receiving waterbodies, and is expected to comply with the project-specific Performance Criteria resulting from the USACE 404 Permit and related agency actions. Mitigation measures are proposed below to require implementation of the Project Design Features which serve to eliminate potential significant impacts discussed above. Therefore, the impacts to surface waters are anticipated to be less than significant with the implementation of the Proposed Project.

3.4.2 Groundwater Quality

The potential for the Proposed Project to result in groundwater contamination, modification of existing contaminant movement, or expansion of the contaminated area is analyzed in Section IV.I, Safety/Risk of Upset.

Title 22, Division 4, Chapter 15 of the California Code of Regulations establishes primary and secondary drinking water standards for public water systems based upon national standards. Groundwater in the area of the Proposed Project is not currently used for drinking water. See Section IV.I, Safety/Risk of Upset for further discussion.

3.4.2.1 Urban Development Component

Given the relatively shallow depth to groundwater in the area of the Proposed Project, below-grade construction activities for the Urban Development Component could potentially encounter groundwater, thereby requiring dewatering during construction. In addition, long-term dewatering during operation of the Urban Development Component may be required for structures that would be constructed below the groundwater table surface, such as subterranean (underground) parking garages. The proposed permanent dewatering systems, which includes dewatering for the methane safety system and dewatering of two-level subterranean parking garages (it would not be necessary for one-level subterranean garages), is a "contingent" system that would operate only if/as groundwater elevations occur at the level of the dewatering pipes. In case groundwater is present or in the future rises to an elevation above the elevation of the groundwater pipes, the water is conveyed to a sump where it is removed by automatic pumps. The dewatering system does not include dewatering by pumping from deep wells or any specific well points.[230] Adverse impacts are not anticipated relative to the rate or change in the direction or movement of existing contaminates in groundwater from dewatering associated with operation of the permanent dewatering systems. This is because the maximum flow of the dewatering pipes is very low and their radius of influence on the groundwater unit is limited. Therefore, the dewatering pipes are not anticipated to draw water across any substantial distance, and impacts would be less than significant. To date, no effect on plume movement has been observed in relation to the operation of permanent dewatering systems anywhere within the adjacent Playa Vista First Phase Project site, and similar results are anticipated for such systems installed within the Proposed Project. See Section IV.A, Earth and Section IV.I, Safety/Risk of Upset, for further discussion of the potential impacts of dewatering on subsidence and groundwater contamination, respectively.

As described in Section IV.I, Safety & Risk of Upset of this EIR, groundwater contamination has been observed both beneath the Urban Development Component as well as under adjacent areas – former Test Site 2 and former industrial areas east of the Proposed Project site and within the adjacent Playa Vista First Phase Project. A detailed discussion of contaminated groundwater within the boundaries of the Proposed Project and adjacent areas is found in Subsection 2.2.2.1 of Section IV.I, Safety & Risk of Upset. Two potential impacts could occur from short or long-term dewatering. The dewatering could: (1) affect the rate or change the direction of the movement of existing contaminants; or (2) expand the area affected by contaminants.

Although remedial planning and design for the Proposed Project area are expected to be completed by 2004, remediation of the groundwater is expected to take several years. Therefore, depending on the timing of the construction of the Urban Development Component, dewatering activities could potentially result in the extraction of contaminated groundwater. However, any required remedial action with respect to groundwater is expected to be initiated prior to construction of the Urban Development Component. Therefore, it is likely that the extent and magnitude of contamination at the time of construction will be less than current conditions. In addition, remediation would be conducted under the direction of the RWQCB, and the RWQCB would require that construction and/or long-term dewatering be conducted in a manner that does not negatively impact ongoing remediation or exacerbate the extent of contamination. If necessary, the remedial systems would be modified to preclude or minimize the potential for

[230] *Group Delta Consultants, "Evaluation of Subsidence Due to Lowering of Groundwater in Village at Playa Vista, Playa Vista Development, Los Angeles, California," April 15, 2003.*

dewatering activities to spread contamination. Remedial systems, if any, and dewatering activities, therefore, are expected to be fully compatible.

Short- or long-term groundwater extraction associated with remediation activities has the potential to draw groundwater contamination from areas adjacent to the Proposed Project. To the west of the Urban Development Component, a former industrial area known as former Test Site 2 within the adjacent Playa Vista First Phase Project site is currently undergoing active groundwater remediation. The groundwater remediation at former Test Site 2 includes both in-situ biodegradation of contaminants, as well as groundwater extraction and treatment. Groundwater extraction at former Test Site 2 will create an inward hydraulic gradient toward the treatment zone, i.e., away from the Proposed Project. Therefore, although the adjacent former Test Site 2 area is, under natural conditions, cross-gradient and slightly upgradient of the Proposed Project, the implemented remediation of former Test Site 2 makes it unlikely that groundwater extraction within the Proposed Project would draw contamination from the adjacent areas to the west.

Groundwater beneath the former industrial areas east of the Proposed Project site and within the adjacent Playa Vista First Phase Project is downgradient to slightly cross-gradient from the Proposed Project area. Under current natural conditions, it is unlikely that contamination in these former industrial areas could migrate westward into the Proposed Project. The Remediation Plan for these former industrial areas, approved by the RWQCB in November 2002, is expected to commence implementation by Fall 2003. This Plan specifies active extraction and treatment of groundwater at a number of contaminant source areas in the former industrial areas east of the Proposed Project site and within the adjacent Playa Vista First Phase Project. The extraction will create greater inward hydraulic gradients, away from the Proposed Project and toward the treatment zones, further decreasing the potential for migration of contaminants toward the Proposed Project.

Impacts to groundwater due to dewatering are anticipated to be less than significant with the implementation of the Urban Development component because construction and operation dewatering for the development of the Urban Development Component are not expected to affect the rate or change the direction of movement of existing contaminants or expand the area affected by contaminants for the known contaminant areas beneath the Proposed Project Site, the former Test Site 2, and the former industrial sites east of the Project Site and within the adjacent Playa Vista First Phase Project.

As discussed in Subsection 3.4.1.1, the existing SWPPP enforced by the RWQCB would be updated and amended as appropriate to include Proposed Project construction activities and would be implemented throughout the duration of construction activities on the Proposed Project site. The RWQCB also has the authority to review the SWPPP at the site, declare the SWPPP and/or BMPs to be inadequate, to require an individual NPDES permit for the activity, and to initiate enforcement actions, if necessary. While the BMPs that would be included in the SWPPP are primarily aimed at minimizing the discharge of pollutants to surface receiving waters, the BMPs would also serve to minimize any short-term impacts on groundwater quality from construction activities. Any discharge of groundwater in conjunction with construction dewatering or operational dewatering for structures placed below grade for the Proposed Project would require compliance with the Project's General Construction Permit, an individual NPDES permit, or an appropriate industrial users discharge permit issued by the City of Los Angeles Department of Public Works, Bureau of Sanitation. Although construction of the Urban Development Component would reduce open space and increase the impervious areas of the site, resulting in reduced infiltration (see Subsection 3.2.1.4.2, Section IV.C.(1), Hydrology), additional irrigation of added landscaped areas would offset the decrease, resulting in a net increase of approximately 6 acre-ft/year. This increase is considered positive, but negligible from a regional basin perspective, and is not expected to result in any measurable increase in local groundwater levels.

The Proposed Project would utilize recycled (reclaimed) water for irrigation and office toilet/cooling tower use, which may percolate to local groundwater units. However, such irrigation water must meet or exceed the State Title 22 standards for water quality. Any recycled water that would percolate into local groundwater units would be filtered through varying layers of earth, further enhancing its quality. In addition, the depth to the Silverado Aquifer, which is the only aquifer at the site with beneficial uses, is 100 to 200 feet below ground surface, requiring the recycled irrigation water to percolate through earth and rock in order to reach an aquifer that is pumped for beneficial uses. The upper portion of the Riparian Corridor will have a clay liner further limiting percolation of surface runoff to the groundwater. Therefore, no impacts to groundwater quality from the use of recycled water are expected to occur.

With respect to other operational (long-term) groundwater quality impacts, no land uses (e.g., industrial development) would be permitted or are presently planned that could legally contribute to groundwater contamination within the Proposed Project site. Current state law would regulate the design, construction and operation of any land uses that might include storage of fuel in underground tanks.

Due to the short-term nature of construction and dewatering activities, implementation of applicable construction BMPs, compliance with NPDES requirements for dewatering discharges, and compliance with State Title 22 standards for recycled water quality, development of the Urban Development Component would not result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion). Therefore, a less-than-significant impact to groundwater quality would occur.

Groundwater in the area of the Urban Development Component of the Proposed Project is not currently pumped for beneficial uses (i.e., drinking water, industrial or agricultural supply).

The nearest public water supply well located at Venice Polytechnic High School, approximately 2 miles northwest of the Proposed Project, was capped in 1960 and is not active. The next closest public supply wells are located approximately 3.5 miles northwest of the Proposed Project in the City of Santa Monica. The nearest irrigation well is located approximately 2 miles southeast of the Proposed Project at the Hillside Memorial Park Cemetery. Due to the distance to these wells, the fact that drinking water, industrial or agricultural supply wells would not be constructed as part of the Urban Development Component, and compliance with State Title 22 standards for recycled water quality, construction and operation of the Urban Development Component are not expected to cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. Hence, a less-than-significant impact to groundwater quality would occur.

3.4.2.2 Habitat Creation/Restoration Component

Given the relatively shallow depth to groundwater in the area of the Proposed Project, it is reasonable to expect that any below-grade construction activities for the Habitat Creation/Restoration Component may encounter groundwater thereby requiring dewatering during construction. As described in Subsection 3.4.2.1 above, groundwater remediation at the Proposed Project site is expected to be initiated prior to construction of the Habitat Creation/Restoration Component, thereby reducing the extent and magnitude of contamination to less than current conditions. In addition, remediation would be conducted under the direction of the RWQCB, and the RWQCB would require that construction dewatering be conducted in a manner that does not negatively impact ongoing remediation nor exacerbate the extent of contamination. Remediation at the nearby areas of Test Site 2 and the former industrial areas east of the Proposed Project site and within the adjacent Playa Vista First Phase Project would create an inward hydraulic gradient toward the treatment zone, i.e., away from the Proposed Project, and would also be conducted under the direction of the RWQCB. Due to the short-term nature of construction and dewatering activities, dewatering for the Habitat Creation/Restoration Component is not expected to significantly affect the rate or change the direction of movement of existing contaminants or expand the area affected by contaminants for the known contaminant areas beneath the Proposed Project Site, the former Test Site 2, and the former industrial sites east of the Project Site and within the adjacent Playa Vista First Phase Project.

The Habitat Creation/Restoration Component does not involve the construction of any industrial development that would contribute to groundwater contamination within the Proposed Project site. The Riparian Corridor portion of the Habitat Creation/Restoration Component would collect stormwater runoff from the Proposed Project and off-site tributaries, which could contain pollutants typical of urban development. The Riparian Corridor could detain the stormwater resulting in percolation of the stormwater runoff into the groundwater. However, the upper portion of the Riparian Corridor would have a clay liner limiting percolation of surface runoff to the groundwater. In addition, the depth to Silverado Aquifer, which is the only aquifer at the site with beneficial uses, is 100 to 200 feet below ground surface. Therefore, development of the Habitat Creation/Restoration Component is not expected to result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion).

As described in Subsection 3.4.2.1 above, the nearest public water supply is 2 miles northwest of the Proposed Project, and the nearest irrigation well is located approximately 2 miles southeast of the Proposed Project. Due to the distance to these wells, the fact that no wells would be constructed as part of the Habitat Creation/Restoration Component, and the compliance with State Title 22 standards for recycled water quality, construction and operation of the Habitat Creation/Restoration Component are not expected to cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act.

3.5 Equivalency Program Impacts

The preceding water quality analysis addressed impacts associated with construction and operation of the Proposed Project relative to surface water and groundwater water quality. The proposed Equivalency Program allows for specific limited exchanges in the types of land uses occurring within the Project's Urban Development Component. No changes are proposed under the Equivalency Program to the Project's Habitat Creation/Restoration Component.

The exchange of office uses for retail and/or assisted living units would be accomplished within the same building parameters, and would occur at relatively limited locations within the Project site. Furthermore, under the Equivalency Program, there would be no substantial variation in the Project's street configurations, building pad elevations, or the depth of excavation. Potential changes in land use under the Equivalency Program would therefore have no substantial effect on the predicted loads and concentrations, BMPs, or groundwater use and their associated impacts, because only the use is changing. Specifically, surface water and groundwater water quality requirements for Project development would be the same under the Equivalency Program. Very minor variations regarding foundation types or in the preparation of landscaping areas could occur, however such variation would be within the range of construction procedures anticipated to occur with the Proposed Project. In addition, development under the Equivalency Program would not cause or exacerbate any impacts that would occur under the Proposed Project.

All Project Design Features (as discussed in Subsection 3.3 above) and/or recommended mitigation measures (discussed in Subsection 4.0, Mitigation Measures, below) to minimize water quality impacts under the Proposed Project would be implemented, as appropriate, under the Equivalency Program. Implementation of the Equivalency Program would, therefore, not:

(1) create "pollution," "contamination," or "nuisance," as defined in Section 13050 of the California Water Code; (2) cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan (Basin Plan) for the receiving waterbody; (3) affect the rate or change the direction of movement of existing contaminants in groundwater; (4) expand the area affected by contaminants in groundwater; (5) result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion); or (6) cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. Consequently, with implementation of applicable mitigation measures (discussed below), water quality impacts attributable to the Equivalency Program, as is the case with the Proposed Project, would be less than significant.

3.6 Impacts of Off-Site Improvements

Proposed Project development could result in secondary impacts arising from implementation of the Project's mitigation measures, as well as the direct impacts described above. Mitigation measures within Section IV.K.(1), Traffic and Circulation, require physical improvements in transportation facilities at numerous locations including roadway widening at seven locations, as described in Subsection 5.8 of that Section. In addition, as discussed in Section IV.N.(1), Water Consumption, the Proposed Project would require the construction of a water regulator station in the vicinity of Jefferson Boulevard and Mesmer Avenue. These off-site improvements are all located in developed urban areas. All of the off-site improvements, with the exception of the water regulator station, would occur within, or adjacent to, existing roadways. The water regulator station includes a small amount of above-ground piping equipment, a common element of the urban environment. Implementation of the Project's mitigation measures does not involve the construction of any buildings.

Although the roadway improvements would maintain all of the existing ground elevations and general drainage patterns, there exists the potential that construction-related erosion could increase the sediment content of surface water runoff. Such sediment could be borne away from the area of each improvement in stormwater flows. However, the affected areas are relatively flat and narrow, which limits potential erosion and sedimentation impacts. Nonetheless, the proximity of the improvement areas to listed impaired water bodies, the Santa Monica Bay and the Ballona Channel (via storm drain discharge and flows from the Centinela Channel), poses the potential for water quality impacts. The roadway widenings would be subject to the requirements of the City's Standard Urban Storm Water Management Plan (SUSMP). Under the SUSMP, construction procedures would be implemented to ensure that post-development peak storm water runoff discharge rates would not exceed the estimated pre-development rates such that there would be an increased potential for downstream erosion. The SUSMP requirements also include, but are not limited to, the following: minimizing stormwater pollutants of concern; providing storm drain system stenciling and signage; and providing proof of ongoing Best Management Practices (BMP) maintenance. In addition, stringent erosion controls imposed via the National Pollution Discharge Elimination System (NPDES) would further reduce the potential for surface water pollution to occur. The off-site improvements would result in an incremental increase in the amount of impervious surfaces in some areas, which potentially could provide additional sources of polluted runoff. However, the amount of impervious surface would not be substantially altered. Construction and operation of the proposed improvements are not expected to degrade water quality in the long-term, though temporary negligible water quality impacts from construction dewatering, if necessary, or during storm events may occur.

In terms of dewatering, construction of some improvements may, though unlikely, require dewatering, which would be carried out in accordance with the requirements of a General Dewatering Permit or other requirements of the Regional Water Quality Control Board. Dewatering discharges are not anticipated to violate any water quality standards or waste discharge requirements, and any impacts that result would be less than significant. Operation of the proposed improvements would not contribute wastewater to the storm drain or sanitary sewer system. The proposed improvements would not result in large amounts of wastewater discharge, with the exception of possible, albeit unlikely, dewatering associated with improvements requiring excavation. Such dewatering, if required, would be carried out in accordance with Los Angeles Regional Water Quality Control Board requirements or the provisions of a General Dewatering Permit and is not expected to exceed any wastewater treatment thresholds.

In summary, the proposed off-site roadway and intersection improvements would not result in significant water quality impacts, since the improvements would not: (1) create "pollution," "contamination," or "nuisance," as defined in Section 13050 of the California Water Code; (2) cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan (Basin Plan) for the receiving waterbody; (3) affect the rate or change the direction of movement of existing contaminants; (4) expand the area affected by contaminants; (5) result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion); or (6) cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act.

4.0 MITIGATION MEASURES

Mitigation Measures for the Proposed Project and the Equivalency Program

Mitigation measures implemented for Hydrology will also reduce or avoid water quality impacts. (See Section IV.C.(1), of the EIR, for associated mitigation measures.)

- The Proposed Project shall incorporate the following features to reduce pollutant loadings:
  - Roof drain biofiltration systems to receive and filter runoff from all buildings within the Proposed Project;
  - Water quality catch basin inserts for all catch basins within the Proposed Project site where water is flowing to the Central Storm Drain;
  - A vegetated swale within a park adjacent to the Riparian Corridor to receive and filter low-flow runoff from the Proposed Project prior to entering the Riparian Corridor.
- Prior to issuance of a B-Permit or building permit for construction of the additional BMPs discussed above, as applicable, drawings and specifications of the proposed BMPs shall be submitted to the City of Los Angeles for review and comments. Such information shall include, but is not limited to, a site map showing locations of the proposed BMPs, product manufacturer, model number, and manufacturer's recommended maintenance schedule.
- The Proposed Project shall include on-site operation and maintenance programs designed to minimize environmental impacts including:
  - Only slow-release fertilizers that are applied directly to the soil shall be used to establish vegetation. No fertilizer shall be applied during or within 72 hours of a forecasted rain event. Erosion and sediment control measures shall be implemented during landscaping of the project to minimize the export of nutrients from the Proposed Project site.
  - The Proposed Project shall include the use of native or drought-resistant vegetation in no less than 50 percent of the community landscaped areas and an irrigation program that emphasizes no excess irrigation. Any non-native vegetation selected for landscaping shall be noninvasive.
  - The Proposed Project shall install trash racks at inlets to the Riparian Corridor.
  - All multi-family buildings within the Proposed Project shall include trash collection and storage areas for residents, and managed trash collection areas for commercial businesses.
  - The Master Homeowner's Association shall provide tenants/residents with information to encourage compliance with good housekeeping practices, such as proper disposal of household and office hazardous waste; encourage tenants/residents not to plant exotic grasses or other plants whose seeds may potentially migrate off their properties via wind, rain, or animals; and to inform

residents of the potential receiving waters impacts of excessive dry-weather runoff.

- Prior to issuance of any grading, building or B-Permit, the existing Playa Vista Stormwater Pollution Prevention Plan (SWPPP) shall be amended to include the Proposed Project. The SWPPP shall identify temporary Best Management Practices (BMPs) to be implemented in accordance with the General Construction Permit issued by the Regional Water Quality Control Board (RWQCB). BMP categories deployed during construction shall include contractor activities practices, waste management practices, soil stabilization (erosion control) practices, sediment control practices, roadway cleaning/tracking control practices, vehicles and equipment cleaning, concrete truck washout and fueling practices.

<u>**Additional Mitigation Measures for the Off-Site Improvements**</u>

- Construction contractor(s) selected for the proposed improvements shall be required, through contract specifications, to use grading and excavation techniques that control runoff from the off-site traffic improvements, as well as Best Management Practices (BMPs) to avoid/control erosion and sedimentation. The contractor(s) shall also be required to implement other BMPs appropriate for the nature, location, timing (relative to rainy season) and duration of proposed construction activities. Typical BMPs related to construction activities include the following:

  - Erosion and sediment controls including soil stabilization, silt fence installation and/or sandbag installation;

  - Wind erosion controls such as using only the minimum amount of water to control dust without adding to runoff;

  - Tracking controls such as construction vehicle egress management for sedimentation carried on vehicles leaving the site;

  - Spill prevention and control measures such as regular inspections of vehicles for leaks, and prevention measures such as oil pans under parked vehicles; and

  - Concrete and construction materials management such as the avoidance of fresh concrete washing unless runoff can be drained to a bermed or level area away from drain outlets or channels.

- Permanent BMPs shall be integrated into the design and operation of off-site improvements, as appropriate. Examples of such BMPs include street sweeping, catch basins, directing surface runoff into landscaped medians/strip, and other water quality treatment measures as feasible and appropriate.

5.0 UNAVOIDABLE ADVERSE IMPACTS

With implementation of the mitigation measures, impacts to surface water quality would be less than significant, as the Proposed Project, inclusive of the Project's Equivalency Program and off-site improvements, is not anticipated to create pollution, contamination or nuisance as defined in Section 13050 of the CWC or cause a regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan (Basin Plan) for the receiving waterbodies, and as reflected in the Performance Criteria.

Impacts to groundwater quality would be less than significant, as the Proposed Project, inclusive of the Project's Equivalency Program and off-site improvements, is not anticipated to affect the rate or movement direction of existing contaminants; expand the areas affected by contaminants; increase the level of groundwater contamination (including that from direct percolation, injection or saltwater intrusion); or cause regulatory water quality standards of existing production wells to be violated as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act.

6.0 CUMULATIVE IMPACTS

The majority of the off-site tributary area (see Figure 32 on page 371 of Section IV.C.(1), Hydrology, for a map of the tributary area) is already highly urbanized. The off-site tributary area includes the Proposed Project, including the Project's Equivalency Program, and the subset of related projects within the tributary area, which includes the adjacent Playa Vista First Phase Project, West Bluff project (Tentative Tract 51122), and the Loyola Marymount University expansion. These development projects are able to be accommodated by the Freshwater Marsh, and are therefore not expected to substantially affect the water quality or hydrology of the Freshwater Marsh, the Ballona Wetlands, or the Ballona Channel. The Loyola Marymount University expansion is not expected to cause any cumulative impacts in the Freshwater Marsh or it receiving waters because the overall land use and drainage areas are not changing significantly. The West Bluff Project includes 27 acres of area that will be diverted to the Freshwater Marsh via the Lincoln Storm Drain. This diverted runoff increases the average annual runoff volume to the Freshwater Marsh by approximately 3.4 percent, which is insignificant considering the Marsh has approximately a 50 percent excess capacity (i.e. the SUSMP requires that a 0.75-inch storm must be captured and treated and the Freshwater Marsh has a capacity for about an 1.1-inch storm). This small increase in runoff may add to the current annual pollutant loadings to the Marsh and the Ballona Channel (an estimated 2 to 4 percent increase in modeled pollutant loadings). With this small loading increase, overall pollutant loads to the Ballona Channel and Wetlands would still be substantially below pre-First Phase conditions, prior to construction of the Freshwater Marsh. In addition, the concentrations of all modeled pollutants are still expected to either decrease or remain the same in the main body and the effluent from the Marsh due to the increase in runoff volume combined with increased pollutant removals expected in the CDS unit to be installed by Caltrans that will treat Lincoln Boulevard runoff prior to discharging to the Freshwater Marsh. Finally, the Freshwater Marsh was designed with an adjustable outlet weir to accommodate runoff from potential future development and other watershed management changes. Therefore, the addition of the West Bluff Project runoff is not anticipated to cumulatively impact the Freshwater Marsh or its receiving waters.

In addition to the two off-site projects discussed above, there are seven roadway widenings that are planned to mitigate traffic congestion caused by the Proposed Project. The Centinela Corridor improvements will add approximately 0.6 acres of impervious surfaces. The other intersection improvements which include Culver Boulevard and Inglewood Boulevard, Sawtelle Avenue and Culver Boulevard, La Tijera Boulevard and Centinela Avenue, Centinela Avenue and Washington Place, Overland Avenue and Culver Boulevard and Centinela Avenue and Culver Boulevard, will add approximately 0.3 acres of impervious surfaces. All of these improvements would eventually drain to the Ballona Channel. The combined imperviousness of the roadway improvements projects is expected to increase the average annual runoff volume to the Ballona Channel by approximately 0.5 acre-feet per year, which is only about 0.2 percent of the average annual runoff from the adjacent Playa Vista First Phase and the Proposed Projects combined. All of these widening projects will be required to meet SUSMP requirements. Given the SUSMP requirements that will apply to these projects and their small size, it is anticipated that the impact associated with these off-site construction projects will be less than significant.

Since the areas surround the Proposed Project are already highly urbanized, other changes or development are not likely to cause substantial changes in regional surface water or groundwater quality. Predicted loads and concentrations in this analysis were based on the total tributary drainage area generating runoff using designated zoning/land uses. In fact, with redevelopment projects (with application of the SUSMP requirements as appropriate) and increases in system-wide controls associated with other elements of the MS4 Permit, it is anticipated over time, regional water quality may improve.

Additionally, related projects are unlikely to cause or increase groundwater contamination because existing statutes prohibit contamination of groundwater by existing and future land uses and also require remediation of existing contamination. The Proposed Project occupies less than 1 percent of the coastal plain hydrologic groundwater basin. As such, and in light of the limited contribution from other projects and Proposed Project's control measures, the Proposed Project's contribution to surface water or groundwater quality impacts, including that of the Project's Equivalency Program, is not cumulatively considerable and, therefore, less than significant. Furthermore, given the overall nature and limited areal extent of the Project's off-site improvements, the potential for cumulative groundwater quality impacts to result from implementation of the roadway and water system improvements is considered low.

Cumulative impacts to surface water quality would be less than significant, as the Proposed Project, inclusive of the Project's Equivalency Program and off-site improvements, is not anticipated to create pollution, contamination or nuisance as defined in Section 13050 of the CWC or cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan (Basin Plan) for the receiving waterbodies.

Cumulative impacts to groundwater quality would be less than significant, as the Proposed Project, the Project's Equivalency Program, and off-site improvements are not anticipated to affect the rate or direction of movement of existing contaminants; expand the areas affected by contaminants; increase the level of groundwater contamination (including that from direct percolation, injection or saltwater intrusion); or cause regulatory water quality standards of existing production wells to be violated as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act.

6.a Volume I, Book 1, Section IV.C.(2), Water Quality, Subsection 3.4.1.2.5, Ballona Channel, page 479, Table 44. Replace the table with Table 44 as shown on page 180 to correct typographical errors.

6.b Volume I, Book 1, Section IV.C.(2), Water Quality, Subsection 3.4.1.2.5, Ballona Channel, page 483, Table 47. Replace the table with Table 47 as shown on page 181 to correct typographical errors.

6.c Volume I, Book 1, Section IV.C.(2), Water Quality, Subsection 3.4.1.2.6, Ballona Wetlands, page 486, Table 48. Replace the table with Table 48 as shown on page 182 to correct typographical errors.

6.d Volume I, Book 1, Section IV.C.(2), Water Quality, Subsection 3.4.1.2.7, Freshwater Wetlands System, page 494, Table 55. Replace the table with Table 55 as shown on page 183 to correct typographical errors.

6.e Volume I, Book 1, Section IV.C.(2), Water Quality, Subsection 3.4.1.2.7, Freshwater Wetlands System, page 495, Table 56. Replace the table with Table 56 as shown on page 184 to correct typographical errors.

6.f Volume I, Book 1, Section IV.C.(2), Water Quality, Subsection 4.0, Mitigation Measures, page 495. Replace the bullet at top of the page with the following:

- The Proposed Project shall incorporate the following features to reduce pollutant loadings, to the extent permissible by applicable codes.

Table 44

REVISED DRAFT EIR TABLE 44, REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE BALLONA CHANNEL FROM THE FRESHWATER MARSH AND BALLONA WETLANDS

	Predicted Average Loads [a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase [b]	67,887	395	2,321	2,592	25.5	10.6	15.4	7.0	63.3	26.1	27,497
With Playa Vista First Phase Project	36,920	287	1,885	1,794	14.4	9.6	8.8	4.9	49.3	18.8	31,447
With Proposed Project [c]	38,413	302	1,977	1,893	15.1	10.1	9.3	5.2	51.8	19.7	33,211
Percent Change from Pre-First Phase to Proposed Project	-43%	-24%	-15%	-27%	-41%	-4%	-40%	-26%	-18%	-25%	+21%
	Predicted Average Concentrations [a]										
	(mg/L)				(µg/L)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase [b]	39.5	0.23	1.4	1.5	14.8	6.5	'9.0	4.1	36.9	15.2	27,497
With Playa Vista First Phase Project	18.8	0.15	1.0	0.9	7.3	4.9	4.5	2.5	25.1	9.6	31,447
With Proposed Project [c]	18.5	0.15	1.0	0.9	7.3	4.9	4.5	2.5	25.0	9.5	33,211
Percent Change from Pre-First Phase to Proposed Project	-53%	-37%	-29%	-40%	-51%	-21%	-50%	-39%	-32%	-38%	+21%

lbs/yr = pounds per year
10^3 ft^3/yr =one thousand cubic feet per year
mg/L = milligrams per liter
µg/L = micrograms per liter
TSS = Total Suspended Solids
TP = Total Phosphorus
TKN = Total Kjeldahl Nitrogen
O&G = Oil and Grease
TCu = Total Copper
DCu = Dissolved Copper
TPb = Total Lead
DPb = Dissolved Lead
TZn = Total Zinc
DZn = Dissolved Zinc

[a] *Subtotals and totals were calculated prior to rounding.*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3, of the Water Resources Technical Report (Appendix F-1).*
[c] *Proposed Project at buildout which would also include the adjacent Playa Vista First Phase Project.*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants.

Table 47

REVISED DRAFT EIR TABLE 47, REPRESENTATIVE STORMWATER CONCENTRATIONS TO THE BALLONA CHANNEL FROM THE FRESHWATER MARSH COMPARED TO WATER QUALITY BENCHMARKS *

Parameter	Water Quality Benchmark	Predicted Concentration
Total Phosphorus (TP), (mg/L) [a]	0.20	0.13
Total Kjeldahl Nitrogen (TKN), (mg/L) [a]	1.5	0.84
Total Suspended Solids (TSS), (mg/L) [b]	60	11.3
Oil and Grease (O&G), (mg/L) [b]	25	0.9

mg/L = milligrams per liter

* *The Water Quality benchmarks apply to receiving waters – not directly to discharges to those receiving waters. Thus the water quality benchmarks are not directly applicable to the Channel. A comparison of the water quality benchmarks is conservative because it does not account for assimilation that may occur once the influent actually enters the receiving waters.*

[a] *U.S. EPA, 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion III. EPA 822-B-00-016.*

[b] *SWRCB, 2001. California Ocean Plan: Water Quality Control Plan Ocean Waters of California.*

Source: GeoSyntec Consultants

Table 48

REVISED DRAFT EIR TABLE 48, REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE BALLONA WETLANDS FROM THE FRESHWATER MARSH*

	Predicted Average Loads [a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase [b]	71,883	241	1,459	1,671	15.9	8.6	9.7	4.4	124.9	44.7	13,329
With Playa Vista First Phase Project	1,417	17	105	113	0.8	0.6	0.6	0.3	2.6	0.9	2,008
With Proposed Project [c]	1,516	18	112	121	0.8	0.6	0.6	0.4	2.8	1.0	2,149
Percent Change from Pre-First Phase to Proposed Project	-98%	-93%	-92%	-93%	-95%	-93%	-94%	-92%	-98%	-98%	-84%
	Predicted Average Concentrations [a]										
	(mg/L)				(µg/L)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase [b]	86.4	0.29	1.75	2.01	19.1	10.3	11.6	5.3	150.1	53.7	13,329
With Playa Vista First Phase Project	11.3	0.13	0.84	0.90	6.0	4.7	4.6	2.7	20.9	7.5	2,008
With Proposed Project [c]	11.3	0.13	0.84	0.90	6.0	4.7	4.6	2.7	20.9	7.5	2,149
Percent Change from Pre-First Phase to Proposed Project	-87%	-54%	-52%	-55%	-69%	-55%	-60%	-50%	-87%	-86%	-84%

lbs/yr = pounds per year
µg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding.*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3, of the Water Resources Technical Report (Appendix F-1).*
[c] *Proposed Project at buildout which would also include the adjacent Playa Vista First Phase Project.*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

Table 55

REVISED DRAFT EIR TABLE 55, REPRESENTATIVE STORMWATER LOADS AND CONCENTRATIONS TO THE MAIN BODY OF THE FRESHWATER MARSH NEAR THE PRIMARY MANAGEMENT AREAS

	Predicted Average Loads [a]										
	(lbs/yr)				(lbs/yr)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase (sum of future contributing drainages) [b]	131,283	358	2,253	2,377	25.5	13.1	13.7	6.3	204.2	91.8	20,829
With Playa Vista First Phase Project	49,240	317	2,000	1,939	17.3	11.0	10.6	5.3	134.1	58.8	25,100
With Proposed Project [c]	49,251	338	2,158	2,069	18.2	11.6	11.1	5.6	139.7	61.8	26,863
	Predicted Average Concentrations [a]										
	(mg/L)				(μg/L)						Volume
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn	(10^3 ft^3/year)
Pre-First Phase (sum of future contributing drainages) [b]	101.0	0.28	1.73	1.83	19.6	10.1	10.6	4.8	157.0	70.6	20,829
With Playa Vista First Phase Project	31.4	0.20	1.28	1.24	11.0	7.0	6.8	3.4	85.6	37.5	25,100
With Proposed Project [c]	29.4	0.20	1.29	1.23	10.9	6.9	6.6	3.3	83.3	36.9	26,863

lbs/yr = pounds per year
μg/L = micrograms per liter
TKN = Total Kjeldahl Nitrogen
DCu = Dissolved Copper
TZn = Total Zinc
10^3 ft^3/yr =one thousand cubic feet per year
TSS = Total Suspended Solids
O&G = Oil and Grease
TPb = Total Lead
DZn = Dissolved Zinc
mg/L = milligrams per liter
TP = Total Phosphorus
TCu = Total Copper
DPb = Dissolved Lead

[a] *Subtotals and totals were calculated prior to rounding*
[b] *Total pollutant loads for pre-First Phase conditions are included in table, to provide a basis for comparison of project impacts. Breakdown of existing pollutant loading for each area is provided in Volume I, Section 3 of the Water Resources Technical Report (Appendix F-1). Sum of future contributing drainages includes Jefferson Storm Drain, Centinela Ditch, Lincoln Storm Drain and off-site tributary areas.*
[c] *Which also includes the adjacent Playa Vista First Phase Project (i.e., Playa Vista Project Buildout).*

Source: Camp Dresser and McKee Inc. and GeoSyntec Consultants

Table 56

REVISED DRAFT EIR TABLE 56, REPRESENTATIVE STORMWATER CONCENTRATIONS TO THE FRESHWATER WETLANDS SYSTEM WITH PLAYA VISTA FIRST PHASE AND PROPOSED PROJECT

	Predicted Average Concentrations									
	(mg/L)				(µg/L)					
	TSS	TP	TKN	O&G	TCu	DCu	TPb	DPb	TZn	DZn
Riparian Corridor at Lincoln [a]	24.9	0.27	1.5	1.3	11.4	9.9	9.6	4.4	137.9	35.2
Central Storm Drain [a]	42.7	0.27	2.1	1.7	15.8	7.3	7.4	3.4	112.1	66.7
Jefferson Storm Drain [a]	87.2	0.29	2.0	2.0	23.9	11.1	10.3	4.7	204.7	121.8
Lincoln Storm Drain – South	42.4	0.26	1.8	1.7	15.5	7.2	4.6	2.1	115.9	69.0
Direct runoff to Freshwater Marsh	88.9	0.05	0.4	0.1	4.1	1.9	1.3	0.6	11.9	7.1
Main Body of the Freshwater Marsh	**29.4**	**0.20**	**1.3**	**1.2**	**10.9**	**6.9**	**6.6**	**3.3**	**83.3**	**36.9**
Freshwater Marsh Effluent	**11.3**	**0.13**	**0.8**	**0.9**	**6.0**	**4.7**	**4.6**	**2.7**	**20.9**	**7.5**

WQ = Water Quality
mg/L = milligrams per liter *µg/L = micrograms per liter* *TSS = Total Suspended Solids*
TP = Total Phosphorus *TKN = Total Kjeldahl Nitrogen* *O&G = Oil and Grease*
TCu = Total Copper *DCu = Dissolved Copper* *TPb = Total Lead*
DPb = Dissolved Lead *TZn = Total Zinc* *DZn = Dissolved Zinc*

[a] These concentrations assume treatment from the on-site treatment controls (catch basin inserts, vegetated swales, and roof-drain planter boxes).

Source: GeoSyntec Consultants

For the purposes of this SWPPP the construction activities associated with the Playa Vista development have been divided into four groups that have different likely pollutant generation characteristics and therefore different pollution controls, these are:

- Demolition activities (removal of existing infrastructure and buildings)
- Utility services installation (surface grading, road construction, pipe laying)
- Vertical construction (residential and commercial building)
- Habitat conservation (areas that will not contain structures)

The four areas of construction development are described below and the potential pollutants highlighted. Particular BMPs that should be incorporated into individual Contractor SWPPPs and be employed on site during the construction are listed (more details of the particular BMPs are provided in Section 4).

3.1 CONSTRUCTION TYPE 1 – DEMOLITION ACTIVITIES

3.1.1 Sediment

Increased quantities of sediment in waterways are the most common pollutant from construction sites. Once stripped of vegetation, exposed soils can be easily eroded by a combination of wind and rainfall/ runoff. Increased amounts of sediments in streams reduce light penetration (and therefore the livability for organisms), can smother benthic habitats, and can reduce the conveyance capacity of drainage systems potentially causing flooding. Many pollutants are also transported to waterways by attachment to fine sediment particles. Controlling sediment runoff from construction projects is critical to protecting downstream waterways.

Appropriate BMPs to control sediment generated by demolition activities include:

- Scheduling
- Preservation of existing vegetation
- Erosion and sediment controls
- Wind erosion controls
- Tracking controls
- Drainage controls

3.1.2 Toxics

Toxic contaminants may find their way into waterways through poor management of toxic materials such as paint strippers, solvents, adhesives, and vehicle fuels. This is particularly relevant during demolition activities when unidentified materials may be encountered and should be managed in a careful manner.

Appropriate BMPs to control toxics generated by demolition activities include:

- Waste management practices
- Spill prevention and control measures
- Vehicle and equipment cleaning, fueling, and maintenance controls
- Contaminated soil management
- Material delivery and storage controls

3.1.3 Trace Metals

Coated material such as galvanized metal, painted surfaces and preserved wood can all contain high levels of trace metals that can reach the storm water system if adequate management is not conducted with due care.

Appropriate BMPs to control trace metals generated by demolition activities include:

- Waste management practices
- Spill prevention and control measures
- Vehicle and equipment cleaning, fueling, and maintenance controls
- Contaminated soil management
- Material delivery and storage controls

3.1.4 Bacteria

During demolition activities there is the potential to mobilize bacteria into the waterways, especially should a disturbance to the existing sewer system be experienced. This may be particularly relevant near the North Outfall sewer, located within the lower portion of the bluff. In addition, adequate management of temporary bathroom facilities on site can lead to bacterial contamination of the waters.

Appropriate BMPs to control bacteria generated by demolition activities include:

- Measures to ensure compliance with State or local waste disposal, sanitary sewer, or septic system regulations
- To the extent practicable, portable toilets will be placed a safe distance away from paved areas or provided with sandbag berms to guard against accidental overturning of them onto paved areas by vehicles.

3.1.5 Litter

During the demolition process there may be materials that break and can potentially be blown or washed into waterways as litter (e.g., plastic linings, insulation, workers' litter). These materials can degrade the downstream waterways through their aesthetic impact and could potentially be ingested by wildlife.

Appropriate BMPs to control litter generated by demolition activities include:

- Waste management practices

3.2 CONSTRUCTION TYPE 2 – UTILITY INSTALLATIONS

3.2.1 Sediment

The largest concern with the utility installations is the mobilization of sediment from grading activities. The nature of removing vegetation and grading the exposed soils leaves them particularly prone to erosion and wash-off into nearby waterways.

Increased amounts of sediments in streams reduce light penetration (and therefore the livability for organisms), can smother benthic habitats, and can reduce the conveyance capacity of drainage systems potentially causing flooding. Many pollutants are also transported to waterways by attachment to fine sediment particles. Controlling sediment runoff from construction projects is critical to protecting downstream waterways.

Appropriate BMPs to control sediment generated by utility installation activities include:

- Scheduling
- Preservation of existing vegetation
- Erosion and sediment controls
- Wind erosion controls
- Tracking controls
- Drainage controls

3.2.2 Toxics

Fuels and lubricants from construction vehicles, chlorinated water from utility line testing and flushing, and soil amendments such as lime and gypsum, can potentially pollute storm water runoff from the construction areas. These toxic materials can severely affect the aquatic life of the waterways if they are present in sufficient concentrations. It is important to properly manage and maintain all working equipment on the construction site.

Appropriate BMPs to control toxics generated by utility installation activities include:

- Waste management practices
- Spill prevention and control measures
- Vehicle and equipment cleaning, fueling, and maintenance controls
- Contaminated soil management
- Material delivery and storage controls
- Concrete and construction materials management
- Ponded water management

3.2.3 Pesticides

Should revegetation be a component of the utility installations inappropriate application of pesticides and/or herbicides can potentially contribute to the pollutant loads in the runoff either through direct application or by being blown or washed into waterways.

Appropriate BMPs to control pesticides during construction activities include:

- Proper types.
- Proper quantities.
- Proper timing of application.

BMPs on the proper types, quantities, and timing of application of pesticides in landscaped areas are also included in the post-construction, Storm Water Management Plan.

3.2.4 Nutrients

Fertilizers are commonly used to promote rapid growth of stabilizing vegetation on disturbed soils after construction. Inappropriate application of fertilizers can contribute excess nutrients (such as nitrogen, phosphorous, and potassium) to waterways and these can lead to excessive algal growth and (given favorable conditions) toxic algal blooms.

Appropriate BMPs to control nutrients during construction activities include:

- Proper types.
- Proper quantities.
- Proper timing of application.

BMPs on the proper types, quantities, and timing of application of fertilizers in landscaped areas will also be included in the post-construction, Storm Water Management Plan.

3.2.5 Bacteria

During utility installation activities there is the potential to mobilize bacteria into the waterways, especially should a disturbance to the existing sewer system be experienced. This may be particularly relevant near the North Outfall sewer, located within the lower portion of the bluff. In addition, adequate management of temporary bathroom facilities on site can lead to bacterial contamination of the waters.

Appropriate BMPs to control bacteria generated by utility installation activities include:

- Measures to ensure compliance with State or local waste disposal, sanitary sewer, or septic system regulations
- To the extent practicable, portable toilets will be placed a safe distance away from paved areas or provided with sandbag berms to guard against accidental overturning of them onto paved areas by vehicles.

3.3 CONSTRUCTION TYPE 3 – VERTICAL CONSTRUCTION

3.3.1 Sediment

The clearing of vegetation and stripping of soils for building construction potentially leaves them exposed to erosion and the resultant delivery of sediment to the surrounding waterways. The delivery of excess amounts of sediments to waterways can reduce light penetration (and therefore the livability for organisms), can smother benthic habitats, and can reduce the conveyance capacity of drainage systems potentially causing flooding. Many pollutants are also transported to waterways by attachment to fine sediment particles. Controlling sediment runoff from construction projects is critical to protecting downstream waterways.

Appropriate BMPs to control sediment generated by vertical construction activities include:

- Scheduling
- Preservation of existing vegetation
- Erosion and sediment controls
- Wind erosion controls
- Tracking controls
- Drainage controls

3.3.2 Toxics

Toxic contaminants may find their way into waterways through poor management of toxic materials such as paint strippers, solvents, detergents, adhesives, and vehicle fuels. This is particularly relevant during building activities when many adhesives and paints are used. There is also likely to be considerable vehicle traffic with deliveries and spills of fuels and lubricants may occur.

Appropriate BMPs to control toxics generated by vertical construction activities include:

- Waste management practices
- Spill prevention and control measures
- Vehicle and equipment cleaning, fueling, and maintenance controls
- Contaminated soil management
- Material delivery and storage controls
- Concrete and construction materials management

3.3.3 Miscellaneous Wastes

Pollutants from building activities such as washout from concrete trucks and runoff from stockpiles of materials for construction can degrade the runoff quality. Careful management is required to manage and minimize the generation of these pollutants.

Appropriate BMPs to control miscellaneous wastes generated by vertical construction activities include:

- Waste management practices

- Spill prevention and control measures
- Vehicle and equipment cleaning, fueling, and maintenance controls
- Contaminated soil management
- Material delivery and storage controls
- Concrete and construction materials management
- Paving operations controls

3.3.4 Litter

Many building materials arrive on-site with considerable packaging and these packaging materials can often find their way into waterways without adequate management. Building staff also require adequate litter facilities for disposal of employee generated litter (such as food and drink related items). Without proper management these item can be blown or washed into surrounding waterways and degrade their value.

Appropriate BMPs to control litter generated by vertical construction activities include:

- Waste management practices

3.3.5 Bacteria

During vertical construction activities there is the potential to mobilize bacteria into the waterways, especially should a disturbance to the existing sewer system be experienced. In addition, adequate management of temporary bathroom facilities on site can lead to bacterial contamination of the waters.

Appropriate BMPs to control bacteria generated by vertical construction activities include:

- Measures to ensure compliance with State or local waste disposal, sanitary sewer, or septic system regulations
- To the extent practicable, portable toilets will be placed a safe distance away from paved areas or provided with sandbag berms to guard against accidental overturning of them onto paved areas by vehicles.

3.4 CONSTRUCTION TYPE 4 – HABITAT CONSERVATION

3.4.1 Sediment

While establishing areas for habitat conservation, any disturbance of vegetation or soils can potentially leave the soil exposed to erosion. This can contribute to an increase in sediment loads within the waterways that can reduce light penetration (and therefore the livability for organisms), can smother benthic habitats, and can reduce the conveyance capacity of drainage systems potentially causing flooding. Many pollutants are also transported to waterways by attachment to fine sediment particles. Controlling sediment runoff from construction projects is critical to protecting downstream waterways.

Appropriate BMPs to control sediment generated by habitat conservation activities include:

- Scheduling
- Preservation of existing vegetation
- Erosion and sediment controls
- Wind erosion controls
- Tracking controls
- Drainage controls

3.4.2 Nutrients

To establish vegetation fertilizers are often applied, however if used improperly or in excess nutrients contained in fertilizers such as nitrogen, phosphorus, and potassium can be washed from the area and into downstream waters where high levels of nutrients can cause growth of algae and reduced dissolved oxygen.

Appropriate BMPs to control nutrients during construction include:

- Proper types.
- Proper quantities.
- Proper timing of application.

BMPs on the proper types, quantities, and timing of application of fertilizers in habitat areas will also be included in the post-construction, Storm Water Management Plan.

3.4.3 Bacteria

During habitat conservation activities there is the potential to mobilize bacteria into the waterways, especially should a disturbance to the existing sewer system be experienced. In addition, adequate management of temporary bathroom facilities on site can lead to bacterial contamination of the waters.

Appropriate BMPs to control bacteria generated by habitat conservation activities include:

- Measures to ensure compliance with State or local waste disposal, sanitary sewer, or septic system regulations
- To the extent practicable, portable toilets will be placed a safe distance away from paved areas or provided with sandbag berms to guard against accidental overturning of them onto paved areas by vehicles.

4.1 APPROACH

This SWPPP is designed and shall be implemented such that storm water discharges and authorized nonstorm water discharges shall not cause or contribute to an exceedance of the applicable water quality standards. The BMPs described in this section are designed to meet the Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) standards to reduce or eliminate storm water pollution, as required by the regulations.

4.2 SCHEDULING

All BMPs shall be in place year-round on an as-needed basis.

During the rainy season, disturbed areas of the construction site that will not be redisturbed for 21 days or more will be stabilized with erosion control measures by the 14th day after the last disturbance. Since the site is in a semi-arid area, if the initiation of soil stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

Tracking controls and perimeter sediment controls, including controls along the physical site perimeter and at active storm drain inlets and sediment basins, shall be implemented prior to the start of construction and maintained throughout the duration of construction activities.

4.3 EROSION AND SEDIMENT CONTROL

For erosion controls to be effective, it is important that provisions for both temporary and permanent controls be implemented. The following principles have been followed to the maximum extent practicable to control erosion and sedimentation in disturbed areas at the site:

1. Fit grading to the surrounding terrain.
2. Time grading operations to minimize soil exposure.
3. Retain existing vegetation whenever feasible.
4. Vegetate and mulch or otherwise stabilize disturbed areas.
5. Direct runoff away from disturbed areas.
6. Minimize the length and steepness of slopes.
7. Keep runoff velocities low.
8. Prepare drainageways and outlets to handle concentrated runoff until permanent drainage structures are constructed.
9. Trap sediment onsite.
10. Inspect and maintain control measures frequently.

Erosion and sediment controls for the grading of the site are shown on Figures 4-1 through 4-19, and are described below.

4.3.1 Soil Stabilization (Erosion Controls)

Since the removal of protective vegetation can result in accelerated erosion, only areas necessary for construction should be disturbed, cleared, or graded. Areas of vegetation to be protected should be clearly designated as no disturbance areas on the plans, and flagged in the field to exclude construction vehicles (BMP 1). Specific shrubs and trees to be preserved should be clearly marked. If possible, vegetative buffer strips should be left adjacent to watercourses.

Disturbed areas on the site include graded earth pads, cut and fill slopes, and graded streets. Land grading will be performed to minimize erosion and protect vegetation. During the rainy season, disturbed areas of the construction site that will not be redisturbed for 21 days or more will be stabilized by the 14th day after the last disturbance. The following stabilization measures will be applied to disturbed areas within this time frame:

Temporary Construction Slopes or Slopes at Finish Grade Not Ready For Landscaping

- All cut and fill slopes adjacent to public streets shall be roughened by track walking (BMP 2) and protected with a hydraulic soil stabilizer (e.g., acrylic copolymer or equivalent) (BMP 9) prior to the rainy season. The protection shall be maintained until the slopes are at finish grade and stabilized with permanent landscaping vegetation or other cover.
- All interior cut and fill slopes shall be protected with a hydraulic soil stabilizer (e.g., acrylic copolymer or equivalent) (BMP 9) prior to the rainy season. The protection shall be maintained until the slopes are at finish grade and stabilized with permanent landscaping or other cover.

Final Slopes to be Hydraulically Seeded

- Slopes with a final inclination of 3:1 (horizontal to vertical) or steeper will be treated with a hydraulically applied bonded fiber matrix (such as Soil Guard by Mat, Inc., or equivalent) (BMP 9). This measure includes the one step hydraulic application of seed, wood fiber, and organic bonding agent to build up a protective blanket on the soil.
- Slopes with a final inclination of steeper than 4:1 but less than 3:1 will be treated with a three-step straw mulch practice (BMP 9). This measure includes the following steps: (1) the application of seed and fertilizer with a trace of wood fiber (Silva Fiber by Weyerhaeuser, or equivalent); (2) the application of blown straw at the rate of 2 tons per acre; and (3) the crimping of the straw mechanically or the tacking of the straw with a liquid tackifier (such as Silva Tack by Weyerhaeuser, or equivalent) at the approximate rate of 100 pounds per acre.
- Slopes that have a final inclination of 4:1 or flatter will be treated with a one-step hydraulic application of mulch (such as Silva Fiber by Weyerhaeuser, or equivalent) at approximately 55 pounds per acre, organic binder (such as Silva Tack by Weyerhaeuser, or equivalent) at approximately 100 pounds per acre, and seed combination (BMP 9).

Final Slopes to be Landscaped

- All final slopes to be landscaped with container plants, sod, and other permanent vegetation other than hydraulic seeding shall be provided with appropriate soil cover (e.g., blankets, mulches, wood chips, etc.) until the permanent vegetation provides effective erosion control.

4.3.2 Sediment Controls

Final cut and fill slopes shall be no steeper than 2:1 (horizontal to vertical). For long slopes, benching may be required to reduce the slope length (BMP 2). Fill slopes shall be constructed in accordance with project specifications.

While smoothly graded cut and fill slopes may be attractive to the eye, they are not beneficial from the standpoints of erosion control and the establishment of vegetative cover. A roughened slope surface slows flow velocities and enhances water infiltration, which in turn enhances vegetative growth. To accomplish these effects, slopes shall be left in a roughened condition, with the texture of the roughened surface trending perpendicular to the direction of runoff (BMP 2). Where the slope is too steep to allow construction traffic to travel parallel to the slope, cleated dozers traveling up and down the slope can produce a satisfactory texture on newly compacted soil (BMP 2).

During construction, storm water runoff shall be directed away from disturbed areas. Properly installed temporary berms (BMPs 6, 7), silt fences (with the toe embedded into the soil) (BMPs 8A, 8B); and sediment basins (BMP 5) shall be used to limit the discharge of sediment and pollutants from the site, as described below.

Temporary sediment basins (BMP 5) will be installed at all drainage locations where more than 10 acres in the upstream drainage area are disturbed at one time. The sediment basins shall provide 3,600 cubic feet of storage for every acre of disturbed land that is drained. For drainage locations with 10 or fewer disturbed acres, temporary sediment traps, silt fences (BMPs 8A, 8B) or equivalent measures will be installed along the downhill boundary of the construction site. It is anticipated that the majority of the site will be provided with temporary sediment basins.

Perimeter sediment controls, including controls along the physical site perimeter (BMPs 6, 7, 8A, 8B) and at active storm drain inlets (BMPs 16, 17, 18), and sediment basins (BMP 5), shall be implemented prior to the start of construction and maintained throughout the duration of construction activities.

4.4 WIND EROSION CONTROL

Dust control measures are used to stabilize soil from wind erosion, and reduce dust generated by construction activities including grading, demolition, and haul roads. Dust control shall be provided daily or more often by the application of water alone or with the addition of magnesium chloride or calcium chloride in accordance with manufacturers' specifications (BMP 9). Care shall be taken to prevent overwatering which may result in runoff or erosion. Oil or other petroleum-based products shall not be used for dust control because the oil may migrate into drainageways or seep into the soil. Acrylic copolymers or other biodegradable products may be used for dust control if approved by Playa Vista.

4.5 TRACKING CONTROL

The construction site will be managed to minimize the amount of dirt, mud, or dust that is generated and can thus be tracked or blown off the site.

All heavy vehicles and trucks will enter and exit from the construction site via a stabilized construction entrance (BMP 3). If tracking is a continued problem, then the entrance will be equipped with a wheel wash facility (BMP 4) to remove excess soil and debris from truck tires before leaving the site.

All sediment spilled, dropped, washed, or tracked onto public rights-of-way shall be removed immediately by hand sweeping or mechanized sweeper. Washing of sediment from the right-of-way shall be prohibited.

Heavily traveled, earthen roads will be sprinkled daily by a water truck for dust suppression (BMP 9). Care will be taken to sprinkle additional areas of exposed soil as necessary during windy periods. Only the minimum amount of water will be used; no runoff will result from this practice.

4.6 DRAINAGE CONTROL

To prevent the development of rills and gullies in graded slopes, runoff will be directed to stabilized conveyance channels and drains (BMP 11). No concentrated flow of water will be allowed to flow down a graded slope face.

Every effort will be made to maintain runoff water in its natural course and direction of flow. Access road surfaces shall be compacted to obtain a dense, smooth and uniform surface for construction vehicles. Access roads shall be sloped in a manner that will prevent ponding and damage from water flow. Roads that will remain unpaved for more than 21 days will be provided with adequate drainage features to reduce erosion. These measures will include rolling dips, waterbars, crowning, drainage swales with check dams, and slope drains (BMP 11).

Where flow is concentrated into storm water conveyance systems, they will be designed to be reduce scour and erosion. Measures to reduce erosion will include channel linings (BMPs 10, 14), slope drains (BMP 11), check dams (BMPs 12, 13), and energy dissipaters (BMP 15).

4.7 NON-STORM WATER MANAGEMENT

Anticipated non-storm water surface discharges shall not enter any receiving water or storm drain without proper filtration or equivalent treatment (BMP 19). A qualified person as listed in this SWPPP shall monitor any onetime discharges during the time when such discharges are occurring to ensure that no materials other than storm water are discharged. The quantity of the onetime discharge must not have an adverse effect on receiving waters or storm drains.

4.7.1 Waste Management Practices

There will be designated temporary waste storage areas on the site. The sites will be contained within earthen berms (BMP 19). Non-hazardous construction wastes (e.g., vegetation, trash, and construction debris) will be collected from throughout the site once a day and deposited in central piles at the designated waste storage areas. When practical, wastes will be stored within covered dumpsters. All waste materials will be removed from the storage areas by the Contractor or a licensed subcontractor on a weekly basis and transported to an offsite landfill or to the appropriate recycling facility. The disposal of excess material offsite will comply with all Federal, State, and local regulations.

4.7.2 Measures to Ensure Compliance with State or Local Waste Disposal, Sanitary Sewer, or Septic System Regulations

All sanitary wastes will be collected and managed using portable toilet facilities (BMP 19). Portable toilets will be transported to and from the construction site by a licensed contractor. No sanitary wastes will be disposed of onsite. To the extent practicable, portable toilets will be placed a safe distance away from paved areas or provided with sandbag berms to guard against accidental over-turning of them onto paved areas by vehicles.

4.7.3 Spill Prevention and Control Procedures

Spills and leaks are some of the largest sources of storm water pollutants and are, in most cases, avoidable. Avoiding spills and leaks is preferable to cleaning them up after they occur. Heavy equipment (e.g., bulldozers and other grading equipment) and vehicles should be inspected daily (or as often as possible) for leaks and should be repaired as necessary.

Despite precautions, spills may still occur at the site. Spills shall never be cleaned up by hosing off the area. In the event that spills occur, they should be controlled as follows:

<u>Minor Spills</u>

Minor spills typically involve small quantities of oil, gasoline, paint, etc. that can be controlled by the first responder at the discovery of the spill. Control of minor spills involves:

1. Contain the spill
2. Recover spilled materials (if possible)
3. Clean the contaminated area and dispose of contaminated materials.

<u>Medium-Sized Spills</u>

Medium-sized spills still can be controlled by the first responder, along with the aid of other personnel such as laborers, foremen, etc. This response may require the cessation of other activities. Spills should be cleaned up immediately, as follows:

1. Notify the project foreman immediately
2. Contain the spread of the spill (using sand bags or other barriers)
3. If the spill has occurred on a paved or impermeable surface, clean it up using dry methods (absorbent materials, cat litter, and/or rags). Contain the spill by encircling it with absorbent materials.
4. If the spill has occurred on an unpaved or permeable surface, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
5. If the spill has occurred during a rain event, cover the area if possible.

Significant/Hazardous Spills

For large spills or spills involving hazardous materials that cannot be controlled by project personnel, the following steps should be taken:

1. The Foreman should notify the Project Superintendent immediately and follow up with a written incident report.
2. The Project Superintendent will notify local emergency response personnel by dialing 911. In addition, the Project Superintendent will notify the appropriate County officials. It is the Project Superintendent's responsibility to have all of the emergency telephone numbers at the construction site.
3. The Project Superintendent will also notify the California Office of Emergency Services.
4. For spills of federal Reportable Quantity (as established under 40 CFR Parts 110, 117, or 302), the Project Superintendent will notify the National Response Center by telephone at (800) 424-8802. Within 14 days, the Project Superintendent will submit a written description of the release to EPA Region 9, including the date, circumstances of the incident, and steps taken to prevent another release.
5. Retain the services of a Spill Cleanup Contractor or HazMat Team immediately. Construction personnel should not attempt to clean up the spill until the appropriate and qualified staff has arrived at the site.
6. Other agencies that may need to be contacted include the Fire Department, Highway Patrol, Department of Toxic Substances Control, etc.

4.7.4 Vehicle and Equipment Cleaning, Fueling, and Maintenance Controls

Vehicles and heavy machinery are a potential source of pollutants such as petroleum products, antifreeze, and exhaust and waste oil containing heavy metals. Pollutants may enter storm water runoff by means of direct contact with machine parts and by contact with spills on surfaces and the ground. The following control measures can help prevent contact of these potential pollutants with storm water and ground surfaces.

Major equipment maintenance and fuel storage will be conducted within designated maintenance areas in order to enable careful management (BMP 20). During long periods (more than one month) of storage and during maintenance, drip pans will be placed under vehicles and equipment that are prone to leakage. During the rainy season, plastic tarps will be placed over exposed equipment when not in use for long periods (more than three months) to prevent contact with storm water. All on site vehicles will be monitored for leaks and will receive preventive maintenance to reduce leakage.

On-site vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling.

When fueling must occur on site, the contractor shall select and designate an area to be used, subject to approval by Playa Vista. Vehicle fueling areas shall have the following characteristics:

- Located away from storm drain inlets, drainage facilities, or watercourses.

- Bermed to prevent run-on, runoff, and to contain spills.
- Provided with secondary containment techniques, such as drain pans or drop cloths to be used while fueling to catch spills or leaks.
- Provided with vapor recovery nozzles to help controls drips and reduce air pollution.
- Provided with nozzles equipped with automatic shutoff features to prevent overtopping fuel tank.
- Provided with a stockpile of spill cleanup materials that are readily accessible.

Vehicles and equipment will be washed off site at a proper wash facility. The Contractor should not permit any vehicle or equipment washing at the job site. If an exception is granted by Playa Vista and a Contractor is allowed to wash vehicles outside on site, then the outside cleaning area shall have the following characteristics:

- Located away from storm drain inlets, drainage facilities, or watercourses.
- Paved with concrete or asphalt, or stabilized with an aggregate base.
- Bermed to contain wash waters and to prevent run-on and runoff.
- Configured wash area with a sump to allow collection and disposal of wash water,
- Discharges wash water to a sanitary or process waste sewer (where permitted), or to a dead end sump. Wash waters shall not be discharged to storm drains or watercourses.
- Used only when necessary and approved.

Additionally, when cleaning vehicles or equipment with water:

- Use as little water as possible. High-pressure sprayers may use less water than a hose, and should be considered.
- Use positive shutoff valve to minimize water usage.
- Do not use solvents or detergents to clean vehicles or equipment on site.
- Do not permit steam cleaning on site.

4.7.5 Contaminated Soil Management

A number of practices occurring during construction may lead to contamination of soils. For example, leaks and spills of petroleum products from leaking vehicles and routine vehicle and equipment maintenance can cause soil contamination. All contaminated soils must be removed and disposed of correctly (BMP 19). In the event that soil contamination is suspected but not confirmed, the contractor will obtain samples for analysis by a certified analytical laboratory. Decisions regarding soil removal and disposal will be based on the results of the analysis. No contaminated soils shall be buried or otherwise disposed on site.

4.7.6 Material Delivery and Storage Controls

Many materials used in construction can contribute pollutants to storm water runoff. Examples of such materials include vehicle fuels, oils, and antifreeze. Construction materials that have the potential to contribute pollutants should be stored in a manner to prevent or minimize contact with storm water. All construction materials will be delivered to and stored in designated areas at the construction site. The main loading, unloading, and access areas should be located away from storm drain inlets and channels. The Contractor will construct enclosures or flow barriers (berms) around these areas to prevent storm water flows from entering storm drains or receiving waters, and to control the discharge of sediments and other pollutants (BMP 19).

4.7.7 Concrete and Construction Materials Management

Whenever possible, concrete trucks will be washed-out offsite in designated areas. If washout must occur on site, wash water will be contained in a temporary pit (BMP 19). Upon completion of the concrete work, the concrete will be broken up, removed, and reused on site or hauled away. Washing of fresh concrete will be avoided, unless runoff can be drained to a bermed or level area, away from storm drain inlets and channels.

4.7.8 Paving Operations Controls

In order to reduce the potential for the transport of pollutants in storm water runoff from paving operations, paving will not take place within 72 hours of a predicted (> 0.25") storm event. If paving does occur within 72 hours of a significant storm event, catch basin filters, or other appropriate BMPs will be utilized to trap hydrocarbons (BMP 19).

4.7.9 Management of Pesticides and Fertilizers

Apply pesticides only as specified on the "Pesticide Use Recommendation" on the label. The pesticide label is considered the law. Use of a pesticide inconsistent with the label is considered a violation. Minimize the use of pesticides in and near the storm drainage system or watercourses. Record the use of all pesticides. Avoid applying pesticides before a predicted rain event.

If possible, use only natural, organic fertilizers and apply them with a drop spreader. Do not over-irrigate following fertilizer application. Apply only the type and quantity of fertilizer needed, based on the fertility of the soil and the type of vegetation. Do not apply fertilizer before a predicted rain event.

4.8 TRAINING

When properly trained, site personnel are more capable of managing materials properly, preventing spills, and implementing control practices efficiently and correctly (BMP 19). Personnel responsible for the installation, inspection, maintenance, and repair of BMPs, as well as personnel responsible for overseeing, revising, and amending the SWPPP shall be trained in the components and goals of the permit. The following measures will be followed to ensure the

SWPPP is effectively implemented, BMP inspections are performed, BMP maintenance and repair are performed, and appropriate records are prepared and retained:

- Before beginning construction activities and periodically during construction, appropriate Playa Vista personnel and contractor personnel will receive training to implement the SWPPP effectively, perform BMP inspections, perform BMP maintenance and repair, and keep records. Non-storm water discharges and general contractor activity BMPs will also be covered during training. An appropriate forum for training would be "tailgate meetings" that focus generally on the components and goals of the SWPPP, and specifically on the implementation, inspection, and maintenance of the storm water pollution control BMPs.
- Individuals responsible for overseeing, revising, and amending the SWPPPs will also document their training.
- All appropriate new employees and contractors will be trained by staff who are familiar with the SWPPP requirements before they will be permitted to work at the site. Contractors will be responsible for informing their subcontractors about SWPPP requirements.
- BMP drawings, fact sheets, or other specifications will be copied and distributed to contractors and site personnel engaged in the activity in question and/or installation/maintenance of BMPs.
- Site inspectors observing improper construction measures or pollution caused by absent or ineffective BMPs, or by inappropriate actions of site personnel, will inform responsible personnel of proper BMP implementation, along with conducting any needed follow-up inspections.

All training shall be documented and all documentation shall be retained on site with the SWPPP.

4.9 PONDED WATER MANAGEMENT

Ponded storm water shall be settled or filtered for sediment removal, and tested if other contaminants are potentially present. If the water is determined to be uncontaminated, it shall be pumped to the storm drain. If it is determined to be contaminated, it shall be pumped to the Groundwater Treatment Facility (BMP 21).

Water used for utility line testing or flushing shall be dechlorinated before discharge.

MINIMIZE DISTURBANCE AND PROTECT VEGETATION

Construction Specifications

Designate areas of no disturbance. Clearly show on the plans, and flag in the field areas of no disturbance and construction vehicle exclusion.

Designate trees and shrubs that are to be preserved.

Designate watercourse buffer–filter strips.

Only disturb, clear, or grade areas necessary for construction. Flag or otherwise delineate areas not to be disturbed. Exclude vehicles and construction equipment from these areas to preserve natural vegetation.

All graded or disturbed areas including slopes shall be protected during clearing and construction in accordance with the approved erosion and sediment control plan until they are permanently stabilized.

All sediment control measures shall be constructed and maintained in accordance with the approved erosion and sediment control plan and according to the standards and specifications for the appropriate erosion control practices.

If topsoil is required for the establishment of vegetation, it shall be stockpiled in the amount necessary to complete finished grading of all exposed areas.

Areas to be filled shall be cleared, grubbed to remove trees, vegetation, roots and other objectionable material, and stripped of topsoil.

Areas to receive topsoil shall be scarified to a minimum depth of 3 inches prior to placement of topsoil.

LAND GRADING FOR MINIMIZING EROSION

Construction Specifications

All fills shall be compacted as required by building standards to reduce erosion, slippage, settlement, subsidence and other related problems. Fill intended to support buildings, structures, conduits, etc., shall be compacted in accordance with local requirements or codes.

The outer face of the fill slope should be allowed to stay loose, not rolled, compacted, or bladed smooth. A bulldozer may run up and down the fill slope so the dozer treads create grooves perpendicular to the slope.

Use slope breaks, such as diversions, benches, or contour furrows as appropriate, or such as the terrace shown on BMP 2, to reduce the length of cut–fill slopes to limit sheet and rill erosion and prevent gullying.

The finished cut–and–fill slopes, which are to be vegetated, should not be steeper than 2:1.

Roughen the surface of all slopes during the construction operation to retain water, increase infiltration, and facilitate vegetation establishment.

Seeps or springs encountered during construction shall be handled in accordance with approved methods.

Stabilize all graded areas with vegetation, crushed stone, riprap, or other ground cover as soon as grading is completed. Disturbed areas of the site that will not be redisturbed for 21 days or more will be stabilized by the 14th day after last disturbance.

Use mulch to stabilize areas temporarily where final grading must be delayed.

Stockpiles, borrow areas and spoil areas shall be shown on the plans and shall be stabilized to prevent erosion and sedimentation.

TOPSOILING

Construction Specifications

Project engineer will determine whether the quality and quantity of available topsoil justifies selective handling.

Soils of the textural class of loam, sandy loam, and silt loam are best; sandy clay loam, silty clay loam, clay loam, and loamy sand are fair. Do not use heavy clay and organic soils such as peat or muck as topsoil.

Strip topsoil only from those areas that will be disturbed by excavation, filling, road building, or compaction by equipment.

Determine depth of stripping by taking soil cores at several locations within each area to be stripped. Put sediment basins, diversions, and other controls into place before stripping.

Select stockpile location to avoid slopes, natural drainage ways, and traffic routes.

Use sediment fences or other barriers where necessary to retain sediment.

Protect topsoil stockpiles by temporarily seeding and/or mulching as soon as possible to assure the stored material is not exposed and allowed to erode.

If stockpiles will not be used within 12 months they must be stabilized with permanent vegetation to control erosion and weed growth.

Before spreading topsoil, establish erosion and sedimentation control practices such as diversions, berms, dikes, waterways, and sediment basins.

Immediately prior to spreading the topsoil, loosen the subgrade by disking or scarifying to a depth of at least 3 inches, to ensure bonding of the topsoil and subsoil. If no amendments have been incorporated, loosen the soil to a depth of at least 6 inches before spreading topsoil.

Uniformly distribute topsoil to a minimum compacted depth of 2 inches on 3:1 slopes and 4 inches on flatter slopes.

Do not spread topsoil while it is frozen or muddy or when the subgrade is wet or frozen.

Correct any irregularities in the surface that result from topsoiling or other operations to prevent the formation of depressions or water pockets.

Compact the topsoil enough to ensure good contact with the underlying soil, but avoid excessive compaction, as it increases runoff and inhibits seed germination. Light packing with a roller is recommended where high maintenance turf is to be established.

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PROJECT:
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STORM WATER POLLUTION PREVENTION PLAN – REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

LAND GRADING TO MINIMIZE EROSION, PROTECT VEGETATION, TOPSOILING

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DATE: 6-1-01

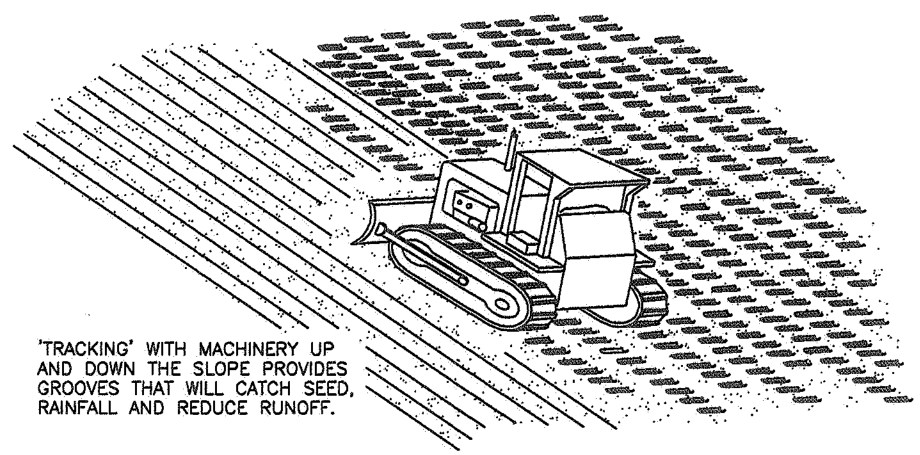
FN: FIG4-1

PROJECT NO: 5209980033.00-00EC1

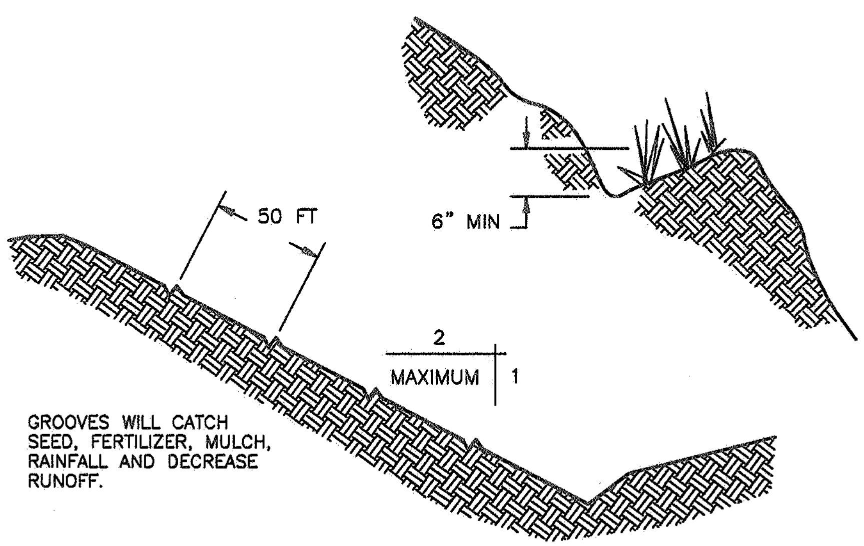
FIGURE NO: 4-1

BMP 1

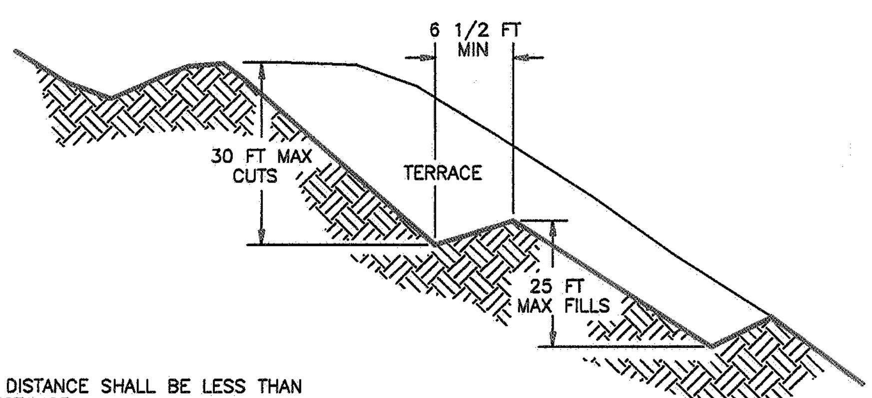
SURFACE ROUGHENING



TRACKING



CONTOUR FURROWS



NOTES:
1. VERTICAL CUT DISTANCE SHALL BE LESS THAN HORIZONTAL DISTANCE.
2. VERTICAL CUT SHALL NOT EXCEED 2 FT. IN SOFT MATERIAL AND 3 FT. IN ROCKY MATERIAL.

TERRACED SLOPE

SURFACE ROUGHENING

Construction Specifications

Cut Slope Roughening
Stair–step grade or groove the cut slopes that are steeper than 3:1.

Use stair–step grading on any erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are particularly suited to stair–step grading.

Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the "step" in toward the vertical wall.

Do not make individual vertical cuts more than 2 feet high in soft materials or more than 3 feet high in rocky materials.

Groove the slope using machinery to create a series of ridges and depressions that run across the slope, on the contour.

Fill Slope Roughening
Place fill slopes with a gradient steeper than 3:1 in lifts not to exceed 8 inches, and make sure each lift is properly compacted.

Ensure that the face of the slope consists of loose, uncompacted fill 4 to 6 inches deep.

Use grooving or tracking to roughen the face of the slopes, if necessary.

Apply seed, fertilizer and mulch, then apply tackifier or punch in the mulch with the proper crimping equipment.

Cuts, Fills, and Graded Areas
Make mowed slopes no steeper than 3:1.

Roughen these areas to shallow grooves by normal tilling, disking, harrowing, or use a cultipacker–seeder. Make the final pass of any such tillage on the contour.

Make grooves formed by such implements close together (less than 10 inches) and not less than 1 inch deep.

Roughening With Tracked Machinery
Limit roughening with tracked machinery to soils with a sandy textural component to avoid undue compaction of the soil surface.

Operate tracked machinery up and down the slope to leave horizontal depressions in the soil.

Do not back blade or scrap the final slope face.

Immediately seed and mulch roughened areas to obtain optimum seed germination and growth.

Maintenance

Periodically check the seeded slopes for rills and washes. Fill these areas slightly above the original grade, then reseed and mulch as soon as possible.

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EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

SURFACE ROUGHENING

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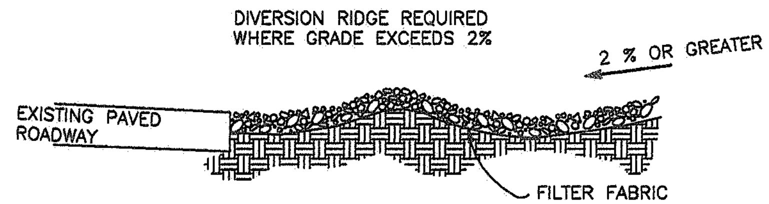
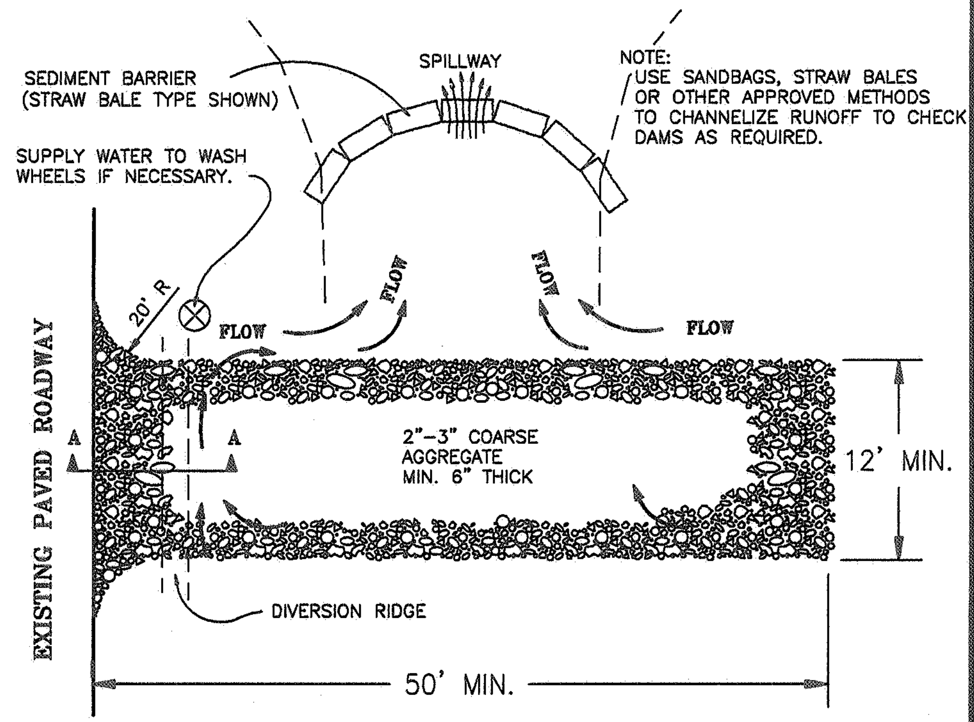
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-2	BMP 2

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT



SECTION A - A



PLAN

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABLIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

Construction Specifications

The aggregate size for construction of the pad shall be 2- to 3-inch stone. Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.

The thickness of the pad shall not be less than 6 inches. Use geotextile fabrics, if necessary, to improve stability of the foundation in locations subject to seepage or high water table.

The width of the pad shall not be less than the full width of all points of ingress or egress and in any case shall not be less than 12 feet wide.

The length of the pad shall be as required, but not less than 50 feet.

Locate construction entrances and exits to limit sediment leaving the site and to provide for maximum utility by all construction vehicles. Avoid entrances which have steep grades and entrances at curves in public roads.

The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand, and repair and/or cleanout of any measures used to trap sediment.

All sediment spilled, dropped, washed or tracked onto public rights-of-way shall be removed immediately by hand sweeping or mechanized sweeper. Washing of sediment from the public right-of-way shall be prohibited.

Provide drainage to carry water to a sediment trap or other suitable outlet.

When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.

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STORM WATER POLLUTION PREVENTION PLAN - REMEDIAL GRADING
EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

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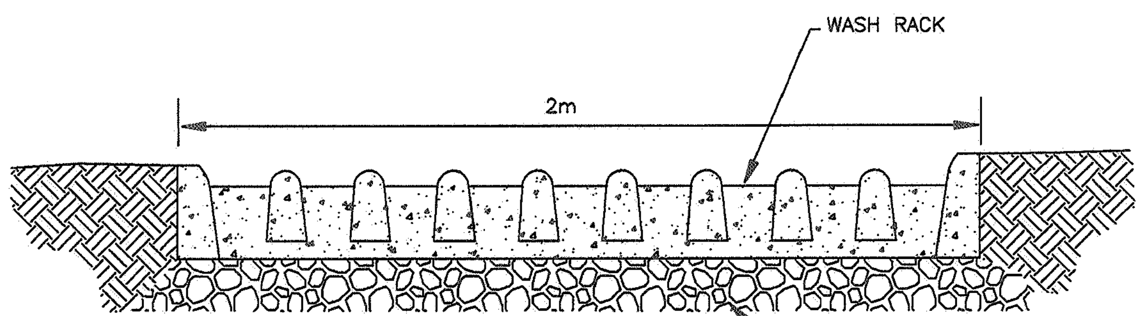
FN: FIG4-3

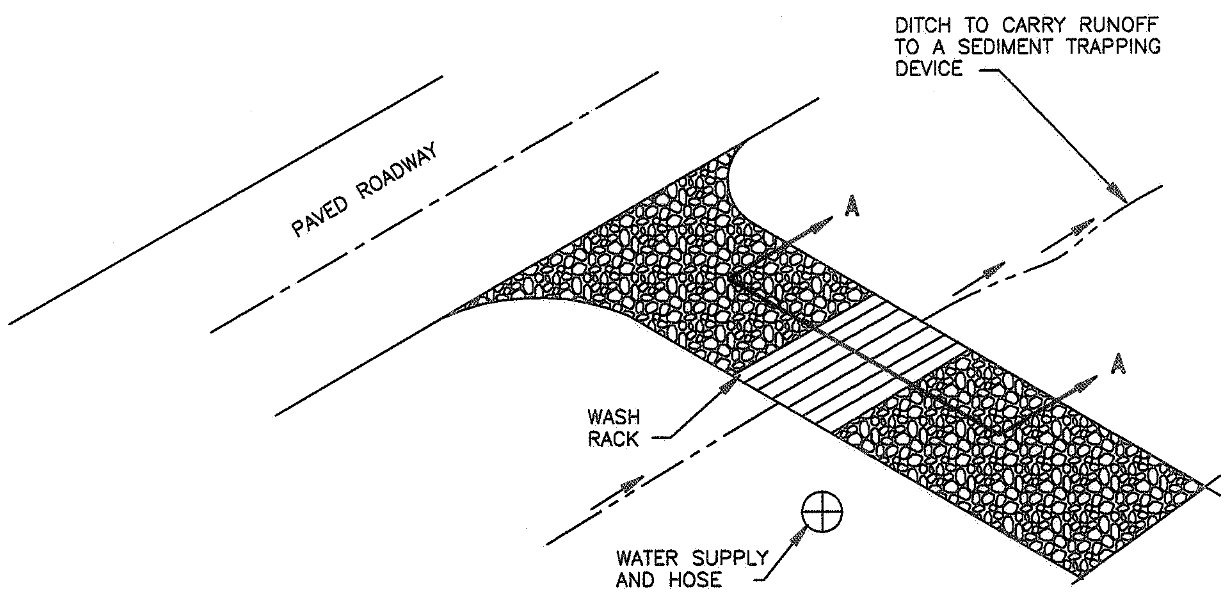
PROJECT NO: 5209980033.00-00EC1

FIGURE NO: 4-3

BMP 3



SECTION A-A
NOT TO SCALE



TYPICAL TIRE WASH
NOT TO SCALE

NOTE:
MANY DESIGNS CAN BE FIELD FABRICATED, OR FABRICATED UNITS MAY BE USED.

ENTRANCE/OUTLET TIRE WASH

Construction Specifications

Incorporate wtih a stabilized construction entrance. See Figure 4–3 – Temporary Gravel Construction Entrance/Exit

Construct on level ground when possible, on a pad of coarse aggregate.

Wash rack shall be designed for anticipated traffic loads.

Provide a drainage ditch that will convey the runoff from the wash area to a sediment trapping device.

Ditch shall be of sufficient grade, width, and depth to carry the wash runoff.

Require that all employees, subcontractors, and others that leave the site with mud–caked tires and/or under–carriages use the wash facility.

Inspection and Maintenance

Remove accumulated sediment in wash rack and/or sediment trap to maintain system performance.

Inspect routinely for damage and repair as needed.

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EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

ENTRANCE/OUTLET TIRE WASH

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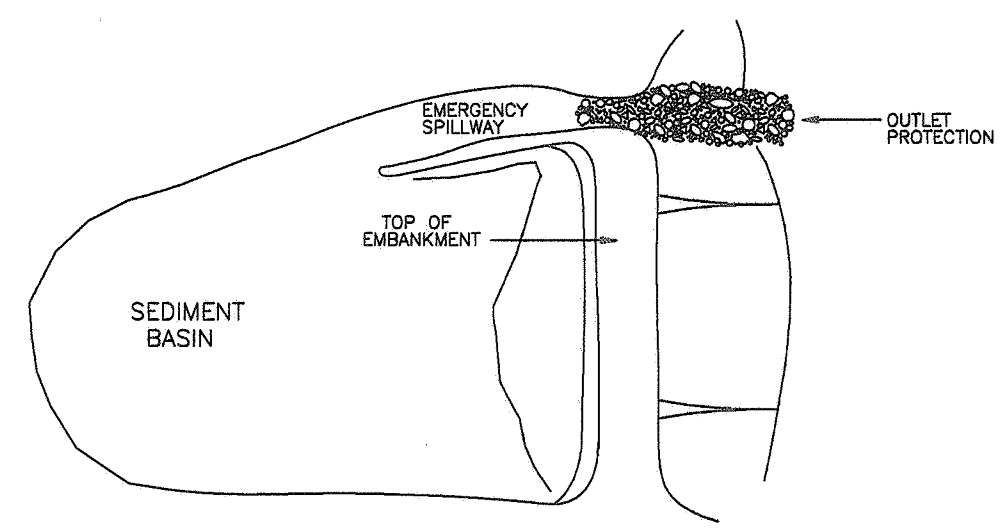
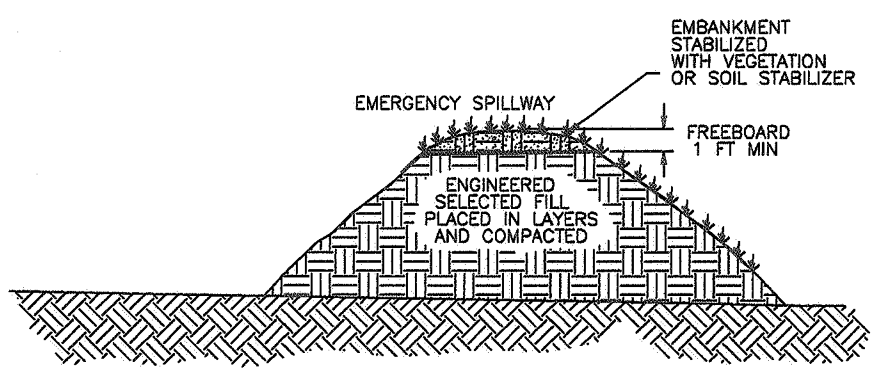
FN: FIG4-4	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-4	BMP 4

TEMPORARY SEDIMENT BASIN



PLAN



SECTION

2. THE CAPACITY OF THE TEMPORARY SEDIMENT

NOTES:

1. THE TEMPORARY SEDIMENT BASIN, DESIGNED BY A QUALIFIED PROFESSIONAL, IS REQUIRED FOR DISTURBED AREAS GREATER THAN 10 ACRES WITHIN A DRAINAGE AREA LESS THAN 100 ACRES.
2. TO COMPLY WITH OPTION 2 OF THE CALIFORNIA GENERAL CONSTRUCTION PERMIT, THE CAPACITY OF THE TEMPORARY SEDIMENT BASIN SHALL BE A MINIMUM OF 3600 CUBIC FEET OF STORAGE FOR EVERY ACRE DISTURBED.
3. THE BASIN SHALL BE PROVIDED WITH A MEANS TO DEWATER IT WITHIN 7 CALENDAR DAYS FOLLOWING A STORM EVENT.

TEMPORARY SEDIMENT BASIN

Construction Specifications

Basin area and areas under the embankment shall be cleared, grubbed and stripped of any vegetation and root material as shown on the erosion and sediment control plan.

A cut-off trench shall be excavated along the centerline of the earth fill embankments. The minimum depth shall be 2 feet. The cut off trench shall extend up both abutments to the spillway elevation.

Fill material for the embankment shall be mineral soil, free of roots, woody vegetation, oversized stones, rocks or other objectionable material and be sufficiently moist for compaction.

Fill material shall be placed in 6-inch lifts, as continuous layers over the entire length of the fill. Compaction shall be obtained by routing the hauling equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel or tread track of the equipment, or by use of a compactor.

The embankment shall be constructed to an elevation of 10 percent higher than the design height to allow for settlement if compaction is obtained with hauling equipment. If compactors are used for compacting, the overbuild may be reduced to not less than 5 percent. The basin shall have a means for dewatering within 7 days following a storm event.

The basin shall have a means for dewatering within 7 days following a storm event.

The embankment and emergency spillway shall be stabilized with vegetation or soil stabilizer immediately following construction. The outflow shall be provided with outlet protection to prevent erosion and scour of the embankment and channel.

Construction operations shall be carried out in such a manner that erosion and water pollution will be minimized.

Local and state requirements shall be met concerning fencing and signs warning the public of hazards of soft sediment and floodwater.

Maintenance

Inspect before, during, and after each rain event.

All damages caused by soil erosion or construction equipment shall be repaired before the end of each working day.

Remove the sediment when the sediment storage zone is 10 percent full. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment or in or adjacent to a stream or floodplain.

When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposit shall be leveled or otherwise disposed of in accordance with the approved erosion and sediment control plan.

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STORM WATER POLLUTION PREVENTION PLAN - REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

TEMPORARY SEDIMENT BASIN

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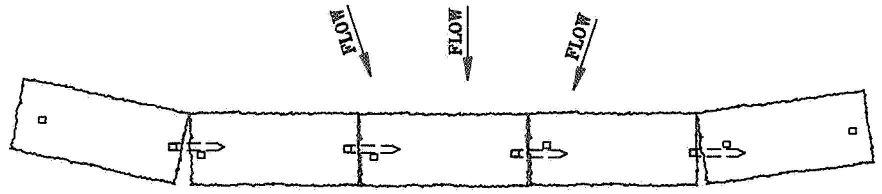
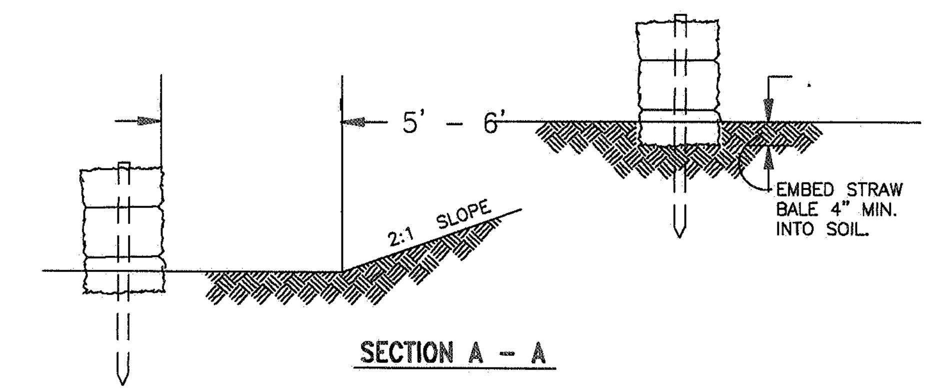
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-5	BMP 5

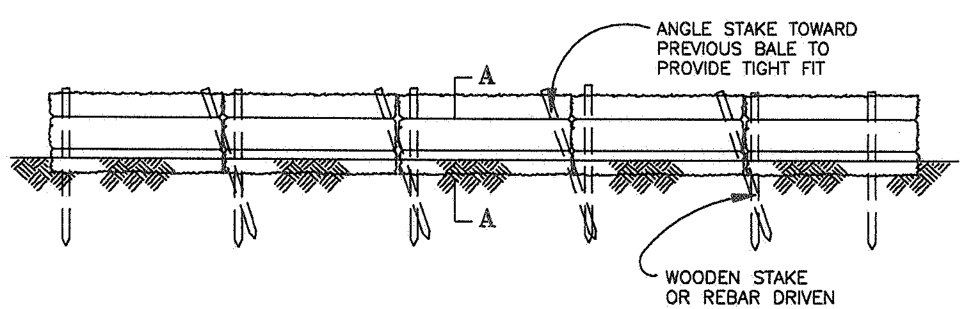
STRAW BALE DIKE



PLAN



SECTION A – A



SECTION B – B

NOTES:

1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING. USE STRAW, ROCKS, OR FILTER FABRIC TO FILL GAPS BETWEEN THE BALES AND TAMP THE BACKFILL MATERIAL TO PREVENT EROSION OR FLOW AROUND BALES.

STRAW BALE DIKE

Construction Specifications

The bales shall be placed on the slope contour at the base of the slope or around the perimeter of the construction site. If the dike is constructed at the toe of a slope, place it 5 to 6 ft. away from the toe of slope if possible.

Do not construct the dike more than one bale high.

Bales shall be placed in a row with the ends tightly abutting.

Each bale shall be embedded in the soil a minimum of 4 inches. Use straw, rocks, or filter fabric to fill any gaps between the bales and tamp the backfill material to prevent erosion under or around the bales.

If the bales are wire bound, they should be oriented so the bindings are around the sides rather than along the top and bottom. Wire bindings that are placed in contact with the soil soon disintegrate and may allow the bale to fall apart.

The bales shall be securely anchored in place by two wooden stakes or rebar driven through the bales. The first stake in each bale shall be driven toward the previously laid bale to force the bales tightly together. Drive the stakes at least 18 inches into the ground.

The straw bales do not need to be anchored if all of the following conditions apply:

The slope length is less than 100 feet;

The bales are used on a relatively flat construction area and the straw bale dike is inspected regularly;

The trapped sediment is removed when required, and repairs are made promptly;

or

If the bales are to be removed and replaced daily to facilitate construction.

Inspection and Maintenance

The straw bale dikes shall be inspected before, during, and after storm events.

Repairs and/or replacement shall be made promptly.

Remove the straw bales when the upslope areas have been permanently stabilized.

Remove sediment behind barrier when it reaches a depth of 6 inches.

Sediment shall be removed and deposited in an area that will not contribute sediment offsite.

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EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

STRAW BALE DIKE

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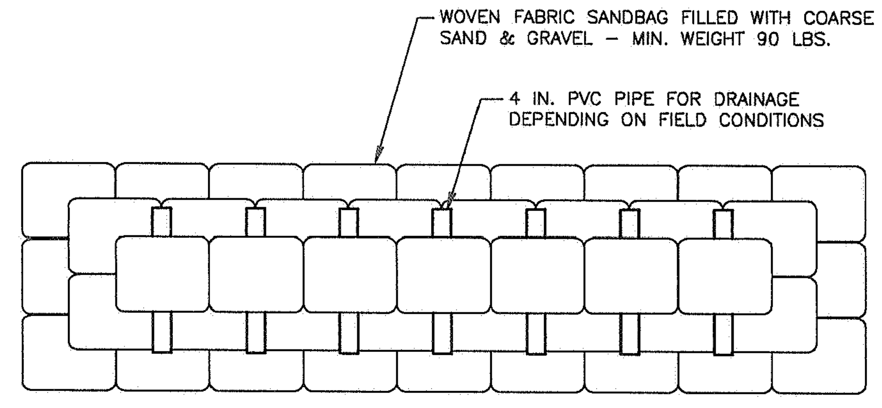
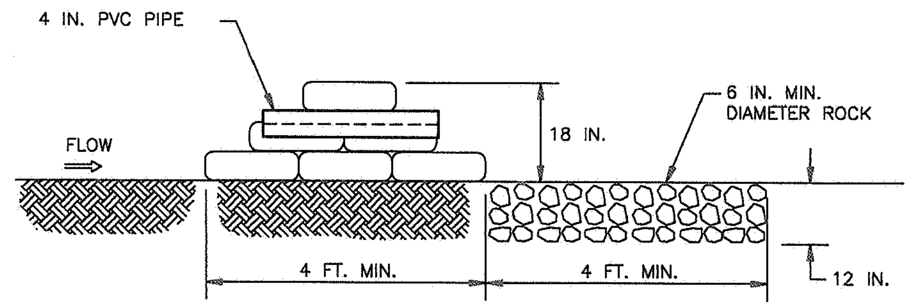
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-6	BMP 6

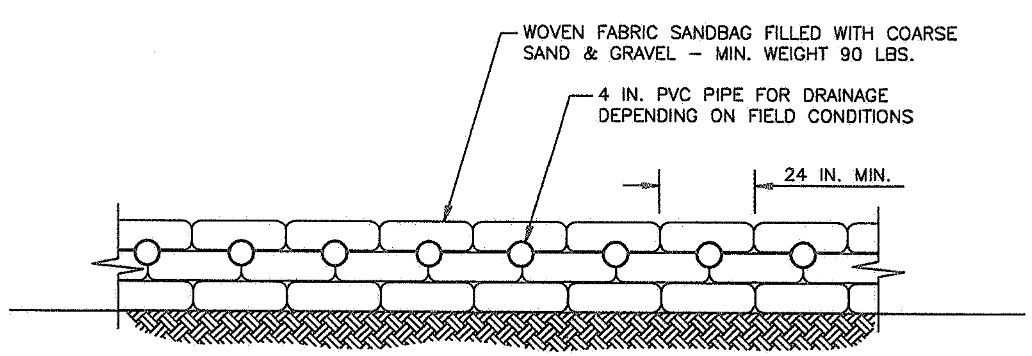
SAND BAG BARRIER



PLAN



CROSS–SECTION



FRONT VIEW

NOTES:

1. STACK SAND BAGS IN AT LEAST THREE VERTICAL ROWS ABUTTING EACH OTHER AND IN A STAGGERED ARRANGEMENT.
2. FOR EACH ADDITIONAL VERTICAL ROW, ADD AN ADDITIONAL ROW TO THE WIDTH.

SAND BAG BARRIER

Construction Specifications

Sand Bag Material:
Sand bag shall be polyproplene, polyethylene or polymide woven fabric, miminum unit weight four ounces per square yard, mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70 percent. Use of burlap is not accepptable since it rots and deteriorates easily.

Sand Bag Size:
Each sand–filled bag shall have a length of 24 in to 32 in, width of 16 in to 18 in, thickness of 6 in to 8 in, and weight of 90 lb to 125 lb. Bag dimensions are nominal, and may vary based on locally availcble materials. Alternative bag sizes shall be submitted to the Engineer for approval prior to deployment.

Fill Material:
All sand bag material shall be non–cohesive, coarse sand or gravel, free from deleterious material. Fill material subject to approval by the Engineer.

Pipe:
Polyvinyl chloride (PVC) pipe with a nominal internal diameter of 4 in, shall be used. The PVC pipe material shall conform to Section 68–3.02A of Caltrans Standard Specifications or alternate material as approved by the Engineer.

Installation

When used as a linear control for sediment removal:
- Install along a level contour
- Turn ends of sandbag row up slope to prevent flow around the ends
- Generally, should be used in conjunction with erosion source controls up slope to provide effective control

When used for concentration flows:
- Stack bags to required height using a pyramid approach
- Upper rows of sand bags should overlap joints in lower rows

Inspection and Maintenance

Inspect sand bag barriers before, during, and after rainfall events.

Reshape or replace sand bags as needed.

Repair washouts or other damage as needed.

Inspect sand bag barriers for sediment accumulation and remove sediment when depth reaches one–third the barrier height.

Sediment removed shall be disposed of properly.

Remove sand bags when no longer needed. Remove sediment accumulation, and clean, regrade, and stabilize the area.

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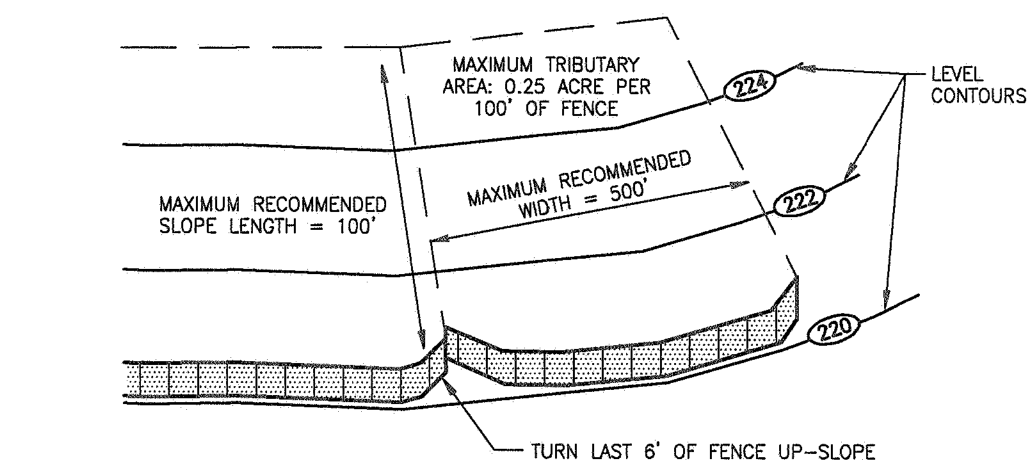
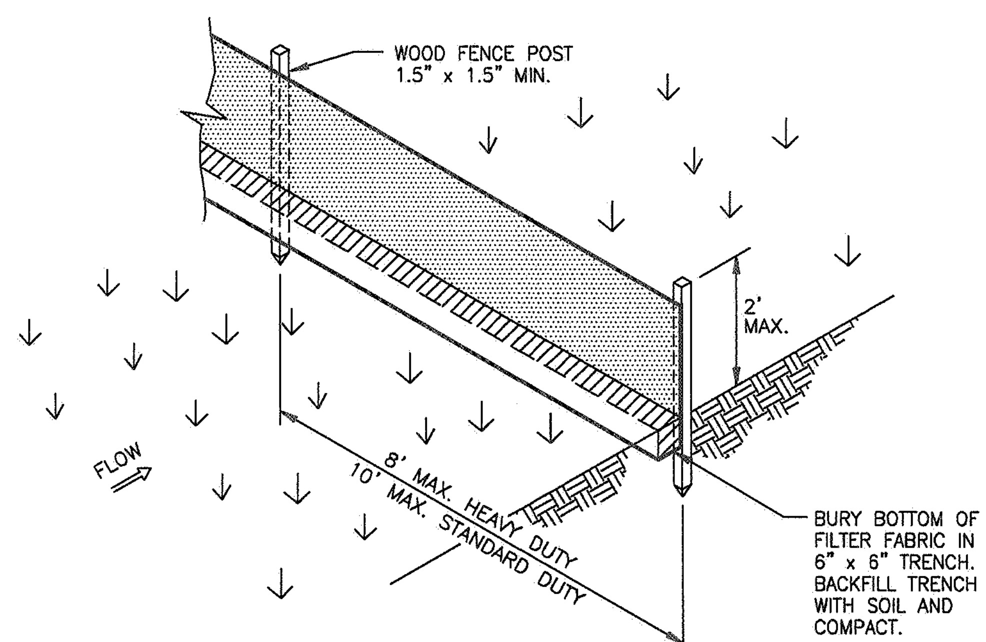
PROJECT NO: 5209980033.00–00EC1	
FIGURE NO: 4–7	BMP 7

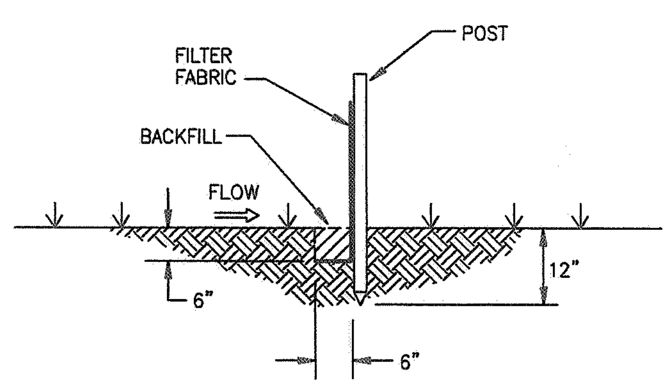
SILT FENCE



TYPICAL PREFABRICATED SILT FENCE LAYOUT



TYPICAL PREFABRICATED SILT FENCE INSTALLATION



SECTION

NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

SILT FENCE

Construction Specifications

Fence fabric shall consist of material approved by its manufacturer for use in silt fence applications.
Select standard duty or heavy duty prefabricated silt fence based on criteria shown below:

Standard Duty Silt Fence
- Slope of area draining to fence is 4H:1V or less
- Use is generally limited to less than five months
- Area draining to fence produces moderate sediment loads
- Use prefabricated standard duty silt fence.
- Lay out in accordance with typical layout
- Install in accordance with standard detail

Heavy Duty Silt Fence
- Slope of area draining to fence is 1H:1V or less
- Use generally limited to eight months. Longer periods may require fabric replacement
- Area draining to fence produces moderate sediment loads
- Use prefabricated heavy duty silt fence. Heavy duty silt fences typically have the following physical characteristics:
  (1) Fence fabric has greater tensile strength than other fabric types available from manufacturer
  (2) Fence fabric has a greater permittivity than other fabric types available from manufacturer
  (3) Fence fabric may be reinforced with a backing or additional support to increase fabric strength
  (4) Posts may be spaced closer together than other premanufactured silt fence types available from manufacturer
- Lay out in accordance with typical layout
- Install in accordance with standard details

Installation

Install silt fence along a level contour, with the last 6 ft of fence turned up slope. Except for the ends, the difference in elevation between the highest and lowest point along the top of the silt fence shall not exceed one-third the fence height.

Generally, should be used in conjunction with erosion source controls up slope to provide effective control.

Inspection and Maintenance

Repair undercut silt fences.

Repair or replace split, torn, slumping, or weathered fabric.

Inspect silt fence before, during, and after storm events. Any required repairs shall be performed immediately.

Remove sediment when accumulation reaches one-third fence height. Sediments removed shall be disposed of properly.

Remove silt fence when no longer needed. Fill and compact post holes and anchorage trench, remove sediment accumulation, and grade fence alignment to blend with adjacent ground.

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PROJECT:
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STORM WATER POLLUTION PREVENTION PLAN - REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

SILT FENCE - PREFABRICATED

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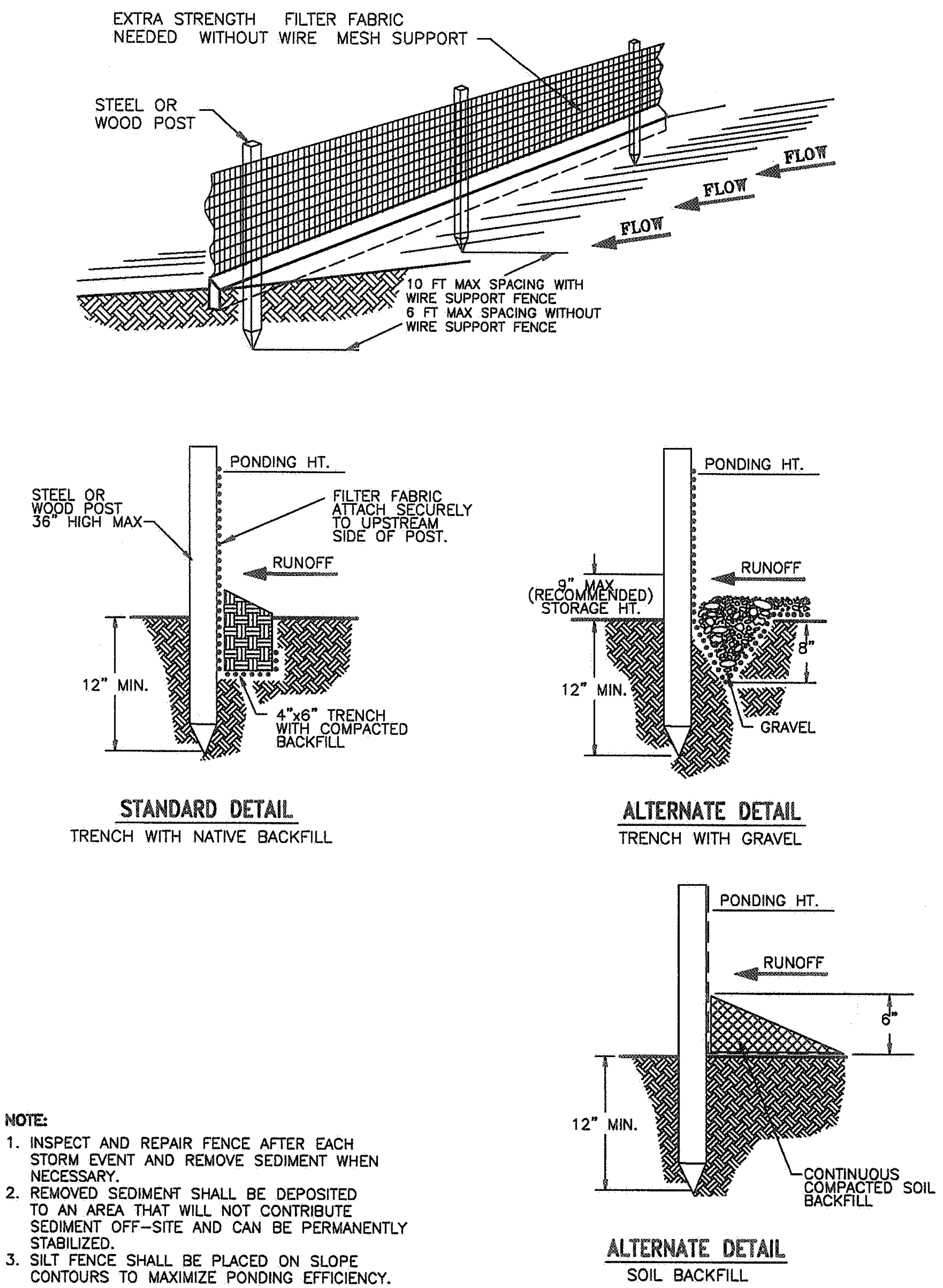
PREPARED BY: CM	
CHECKED BY:	DATE: 6-1-01
FN: FIG4-8A	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-8A	BMP 8A

SILT FENCE



NOTE:

1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

SILT FENCE

Construction Specifications

The height of a silt fence shall not exceed 36 inches. Storage height shall never exceed 18".

The fence line shall follow the contour as closely as possible.

If possible, the filter fabric shall be cut from a continuous roll to avoid the use of joints. When joints are necessary, filter cloth shall be spliced only at a support post, with a minimum 6-inch overlap and both ends securely fastened to the post.

Posts shall be spaced a maximum of 10 feet apart and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without the wire support fence, post spacing shall not exceed 6 feet.

The ends of the fence shall be turned uphill.

A trench shall be excavated approximately 4 inches wide and 6 inches deep along the line of posts and upslope from the barrier.

When standard-strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.

The standard-strength filter fabric shall be stapled or wired to the fence, and 6 inches of the fabric shall extend into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts.

The trench shall be backfilled and/or the soil compacted over the toe of the filter fabric. The filter fabric shall not be secured by sand bags.

Silt fences placed at the toe of a slope shall be set at least 6 feet from the toe in order to increase ponding volume.

Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized, and any sediment stored behind the silt fence has been removed.

Inspection and Maintenance

Silt fences and filter barriers shall be inspected before, during, and after storm events. Any required repairs shall be made immediately.

Sediment shall be removed when it reaches 1/3 height of the fence or 9 inches maximum.

The removed sediment shall be vegetated or otherwise stabilized.

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PROJECT: PLAYA VISTA PROJECT	
STORM WATER POLLUTION PREVENTION PLAN EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES	SILT FENCE - CONSTRUCTED
CERTIFIED PROFESSIONAL CAROL L. FORREST, PE CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL CPESC No 665	
URS 1615 MURRAY CANYON ROAD SUITE 1000 SAN DIEGO, CAL 92108 (619) 294-9400	
PREPARED BY: CM	
CHECKED BY:	DATE: 6-1-01
FN: FIG4-8B	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-8B	BMP 8B

DAILY DUST CONTROL

Daily dust control shall be provided to stabilize soil from wind erosion and to reduce dust generated by construction activities. Special attention shall be paid to stockpiled materials.

Installation / Application

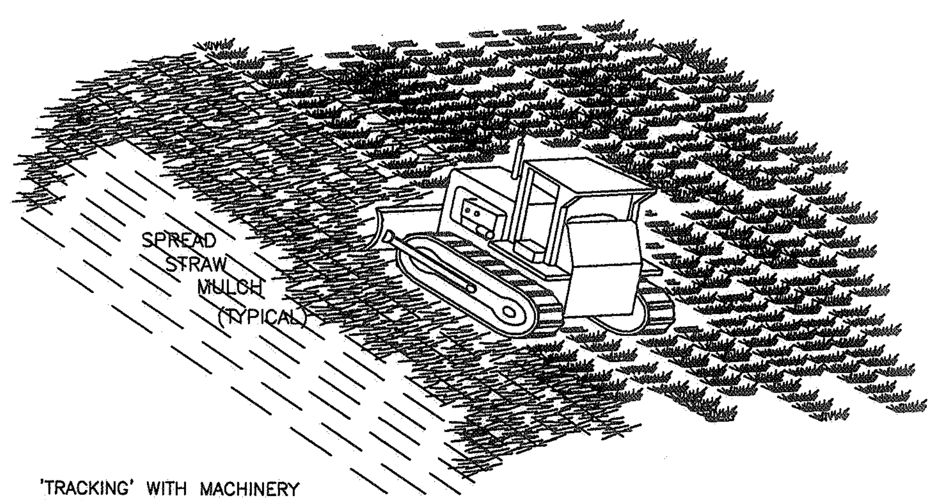
Dust control shall be provided daily or more often by application of water alone or with addition of magnesium chloride or calcium chloride in accordance with manufacturers specifications. Care shall be taken to prevent overwatering which may result in erosion. Oil or other petroleum-based products shall not be used for dust control because the oil may migrate into drainageways or seep into the soil. Acrylic co-polymers or other biodgradable products may be used for daily dust control if approved by the project engineer.

SEEDING AND FERTILIZER

Material Properties

Site specific seed mixtures designed for use in revegetation of denuded and disturbed slopes shall be incorporated into the application of hydraulic erosion control measures in accordance with specifications provided by the project engineer. Seed mixtures may or may not include the simultaneous application of fertilizers.

STRAW ANCHORING



'TRACKING' WITH MACHINERY ON SANDY SOIL PROVIDES ROUGHENING WITHOUT UNDUE COMPACTION.

STRAW ANCHORING

NOTES:
1. ROUGHEN SLOPE WITH BULLDOZER
2. BROADCAST SEED AND FERTILIZER.
3. SPREAD STRAW MULCH 3" THICK. (2 TONS PER ACRE)
4. PUNCH STRAW MULCH INTO SLOPE BY RUNNING BULLDOZER WITH PROPER CRIMPING EQUIPMENT UP AND DOWN SLOPE

HYDRAULIC EROSION CONTROL FOR SLOPES <4:1

Hydraulic mulch shall be Silva-Fiber, as manufactured by Weyerhaeuser, or equilvalent tackifier.

Material Properties

The hydraulic mulch shall meet the following requirements:

- 100 percent wood fiber
- Moisture content (total weight basis) = 12% ± 3%
- Organic matter (oven dried weight basis) = 99.3% min.
- Inorganic matter (ash) content (oven dried basis) = 0.7% max.
- pH at 3% consistently in water (average) = 4.9
- Water holding capacity (oven dried basis) min. = 1000g/100g (1.2 gal/lb fiber)

Installation

The hydraulic mulch and tackifier shall be applied with or without seed and fertilizer at the following rates:

500 lbs/acre wood fiber mulch (Silva-Fiber or equiv.)
100 llbs/acre guar-based tackifier (Silva-Tack or equiv.)

HYDRAULIC EROSION CONTROL FOR 4:1< SLOPES <3:1

Weed-free, bright straw shall be applied as part of a three-step erosion control practice as described below.

Installation:

Step 1: Recommended seed mixture shall be applied with hydraulic seeding equipment, mixing in a trace of a wood fiber mulch (Silva-Fiber by Weyerhaeuser, or equivalent).

Step 2: Two tons per acre loose, weed-free, bright straw shall be applied with a straw blower to achieve uniform coverage.

Step 3: A tackifier (Silva-Tack by Weyerhaeuser or equivalent) shall be applied at a rate of 100 lbs per acre to hold the straw in place. Alternatively the straw shall be mechanically crimped in place as shown on this sheet.

HYDRAULIC EROSION CONTROL SLOPES ≥3:1

Bonded Fiber Matrix Specifications

The Bonded Fiber Matrix (BFM) shall be Soil Guard as manufactured by Weyerhaeuser or equivalent (as approved by project engineer) which is hydraulically applied, and upon drying, adheres to the soil in the form of a continuous 100% coverage, biodegradable, erosion control blanket.

Material Properties

The Bonded Fiber Matrix shall be comprised of long strand, thermally produced wood fibers passing a freeness test at a 760cc (MLS) level or below (>88% of total volume by weight) held together by organic tackifiers (10%) and mineral bonding agents (<2%) which upon drying, become insoluble and non-dispersible.

The formed matrix shall meet the following performance requirements:

The material when mixed into a liquid slurry, shall pass a free liquid quality control test (liquids separate from fibrous solids no greater than one inch in one minute's time as measured on a standard test board).

The binder shall not dissolve or disperse upon watering.

The matrix shall have no holes >1mm in size.

The matrix shall have no gaps between the product and the soil.

The matrix shall have a minimum water holding capacity of 1000g/100g (1.2 gal/lb matrix).

The matrix shall have no germination or growth inhibiting factors and shall not form a water insensitive crust.

The matrix shall be comprised of materials which are 100% biodegradable and 100% beneficial to plant growth.

The Bonded Fiber Matrix (BFM) shall be installed by a contractor certified by the manufacturer to trained in the proper procedures for mixing and application of the product. The BFM shall be mixed according to manufacturers recommendations and contractor shall demonstrate "free liquid" test to inspector upon request. Bonded Fiber Matrix shall be spray applied at a minimum rate of 3000 lb/acre and a maximum of 4000 lb/acre, utilizing standard hydraulic seeding equipment in successive layers as to achieve 100% coverage of all the exposed soil. The BFM shall not be applied immediately before, during, or immediately after rainfall, such that the matrix will have opportunity to dry for 24 hours after installation. The BFM shall be applied with or without seeding, according to the project engineer.

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PROJECT:
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STORM WATER POLLUTION PREVENTION PLAN - REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

HYDRAULIC DUST AND EROSION CONTROL

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FN: FIG4-9	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-9	BMP 9

EROSION CONTROL BLANKETS AND MATTING – CHANNEL INSTALLATION

Construction Specifications

Site Preparation

Proper site preparation is essential to ensure complete contact of the protection matting with the soil.

Grade and shape area of installation.

Remove all rocks, clods, vegetative or other obstructions so that the installed blankets, or mats will have direct contact with the soil.

Prepare seedbed by loosening 2" – 3" of topsoil above final grade.

Incorporate amendments, such as lime and fertilizer, into soil according to soil test and the seeding plan.

Seeding

Seed area before blanket installation for erosion control and re-vegetation or seed after mat installation for turf reinforcement.

When seeding prior to blanket installation, all check slots and other areas disturbed during installation must be reseeded.

Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Anchoring

U-shaped wire staples, metal geotextile stake pins or triangular wooden stakes can be used to anchor mats to the ground surface. Wire staples should be a minimum of 11 gauge. Metal stake pins should be 3/16" diameter steel with a 1 1/2" steel washer at the head of the pin. Wire staples and metal stakes should be driven flush to the soil surface. Two inches of wood staking should remain above the soil surface. All anchors should be 6" – 18" long and have sufficient ground penetration to resist pullout. Longer anchors may be required for loose soils.

Installation in channels

Dig initial anchor trench 12" deep and 6" wide across the channel at the lower end of the project area.

Excavate intermittent check slots, 6" deep and 6" wide across the channel at 25 ft. to 30 ft. intervals along the channel.

Cut longitudinal channel anchor slots 4" deep and 4" wide along each side of the installation to bury edges of matting. Whenever possible extend matting 2" – 3" above the crest of channel side slopes.

Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 1' intervals. **Note:** matting will initially be upside down in anchor trench.

In same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 3".

Secure these initial ends of mats with anchors at 1' intervals, backfill and compact soil.

Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench.

Unroll adjacent mats upstream in similar fashion, maintaining 3" overlap.

Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 1' intervals then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.

Alternate method for noncritical installations: place two rows of anchors on 6" centers at 25' – 30' intervals in lieu of excavated check slots.

Shingle-lap spliced ends by a minimum of 1' with upstream mat on top to prevent uplifting by water or begin new rolls in a check slot. Anchor overlapped area by placing two rows of anchors, 1' apart on 1' intervals.

Place edges of outside mats in previously excavated longitudinal slots, anchor using prescribed staple pattern, backfill and compact soil.

Anchor, fill and compact upstream end of mat in a 12" x 6" terminal trench.

Secure mat to ground surface using U-shaped wire staples geotextile pins or wooden stakes.

Seed and fill turf reinforcement matting with soil, if specified.

Soil filling (if specified for turf reinforcement)

After seeding, spread and lightly rake 1/2" – 3/4" of fine topsoil into the mat apertures to completely fill mat thickness. Use backside of rake or other flat implement.

Spread topsoil using lightweight loader, backhoe, or other power equipment. Avoid sharp turns with equipment.

Do not drive tracked or heavy equipment over mat.

Avoid any traffic over matting if loose or wet soil conditions exist.

Use shovels, rakes or brooms for fine grading and touch up.

Smooth out soil filling just exposing top netting of matrix.

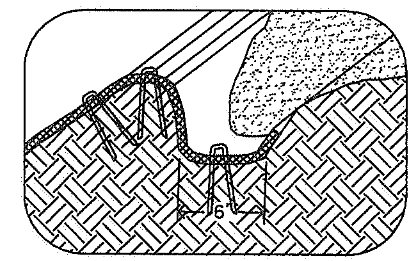
Inspection and Maintenance

All blanket and mats should be inspected periodically following installation.

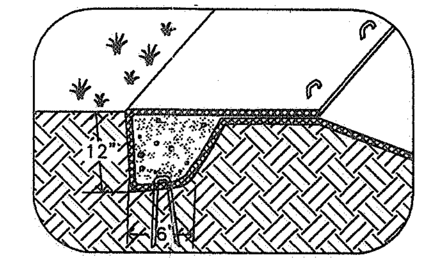
Inspect installation before, during, and after storm events to check for erosion and undermining. Any failure should be repaired immediately.

If washout or breakage occurs, re-install the material after repairing the damage to the slope or drainageway.

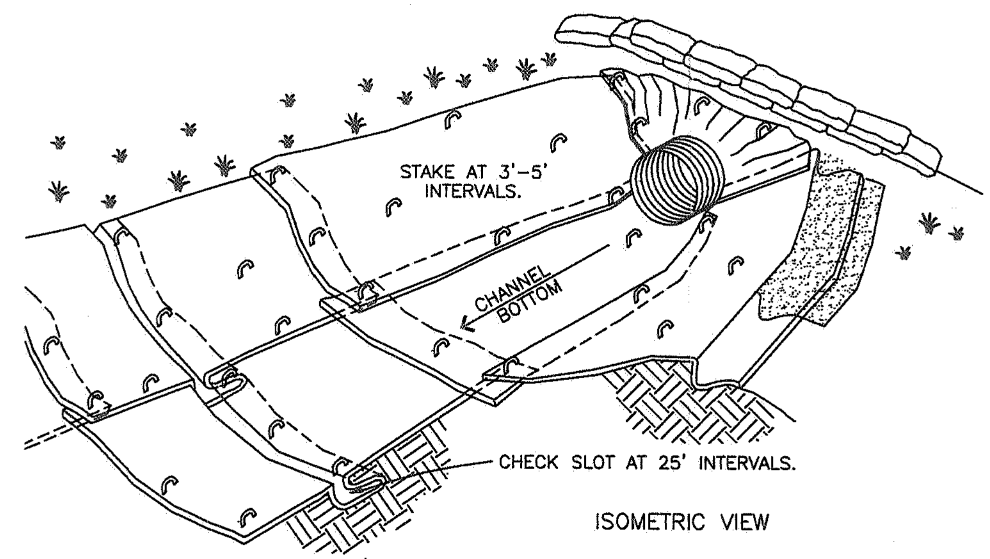
EROSION BLANKETS & TURF REINFORCEMENT MATS CHANNEL INSTALLATION



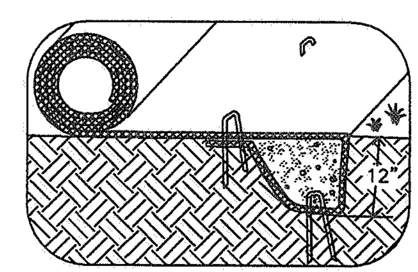
LONGITUDINAL ANCHOR TRENCH



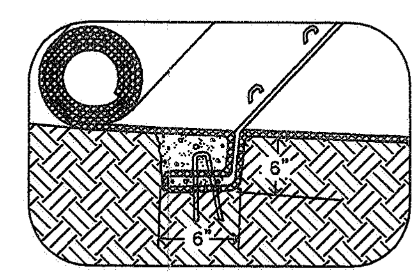
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH



ISOMETRIC VIEW



INITIAL CHANNEL ANCHOR TRENCH



INTERMITTENT CHECK SLOT

NOTES:

1. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
2. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.

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STORM WATER POLLUTION PREVENTION PLAN – REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

EROSION CONTROL BLANKETS AND MATTING CHANNEL INSTALLATION

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FN: FIG4-10	
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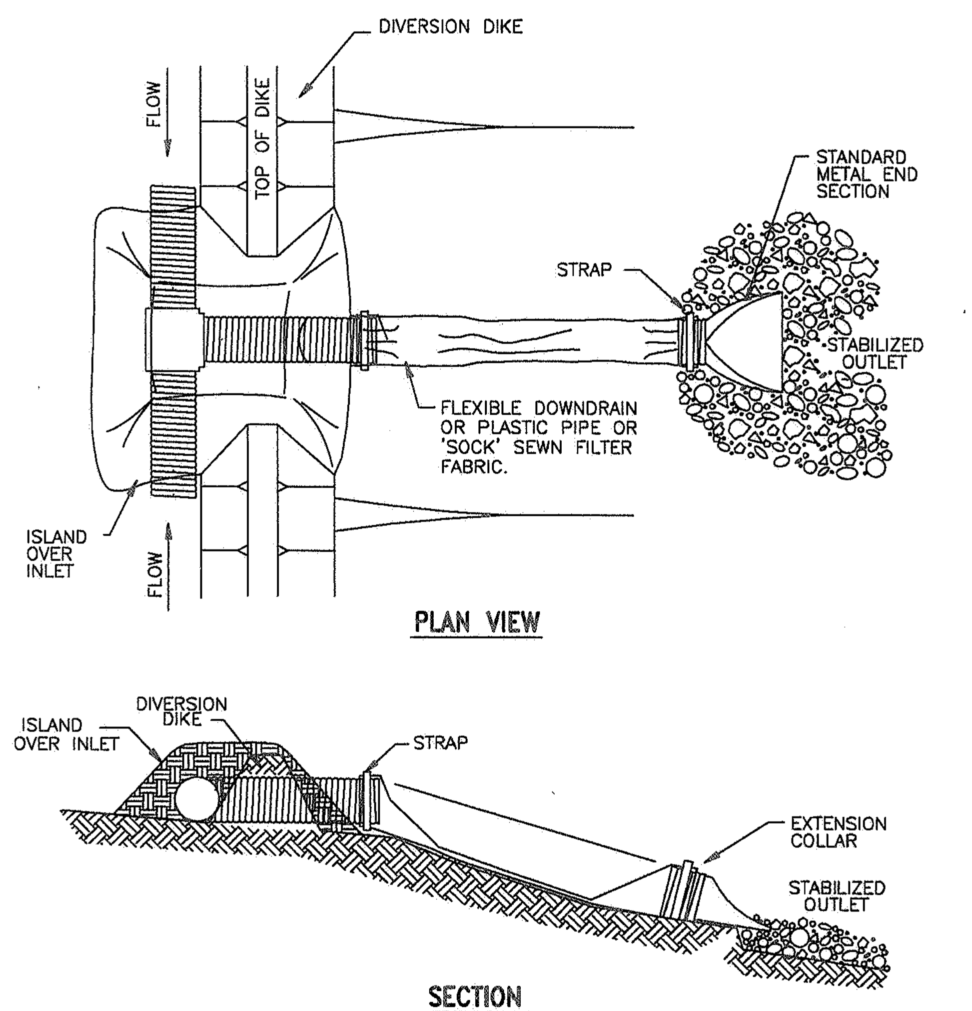
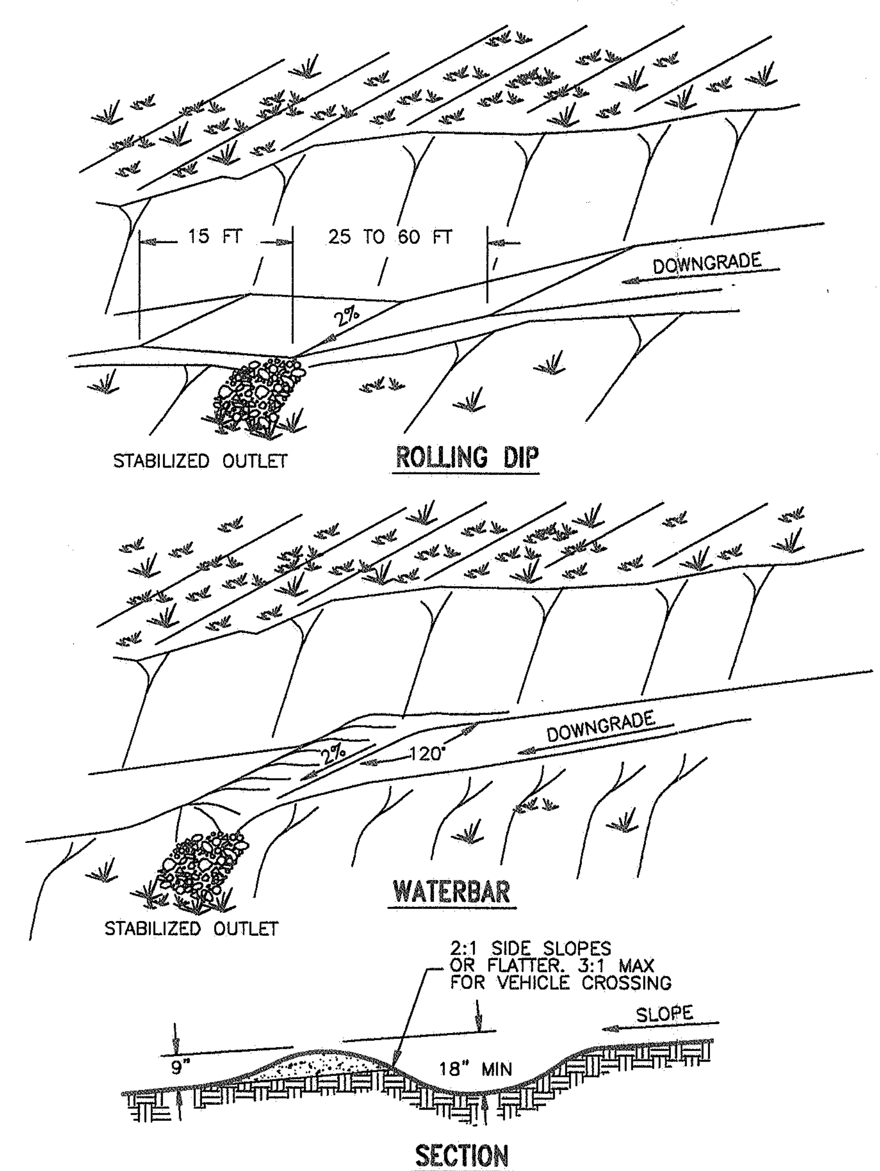
FIGURE NO: 4-10	BMP 10

SLOPE DRAIN



Alternative to flexible downdrain: visqueen flume anchored with closely placed sand bags.

ROLLING DIP AND WATERBAR



SLOPE DRAIN

Construction Specifications

Place slope drains on undisturbed soil or well-compacted fill at locations and elevations shown on the plans.

Slightly slope the section of pipe under the dike toward its outlet.

Compact the soil under and around the entrance section in lifts not to exceed 6 inches.

Ensure that fill over the drain at the top of the slope has a minimum depth of 1.5 feet and a minimum top width of 4 feet. The sides should have a 3:1 slope.

Ensure that all slope drain connections are watertight.

Ensure that all fill material is well-compacted. Securely fasten the exposed section of the drain with grommets or stakes spaced no more than 10 feet apart.

Extend the drain beyond the toe of the slope and adequately protect the outlet from erosion.

Make the settled, compacted dike ridge no less than 1 foot above the top of the pipe at every point.

Immediately stabilize all disturbed areas following construction.

Maintenance

Inspect the slope drain and supporting diversions before, during, and after every storm event and promptly make necessary repairs. When the protected area has been permanently stabilized, temporary measures may be removed, materials disposed of properly, and all disturbed areas stabilized appropriately.

ROLLING DIP AND WATERBAR

Construction Specifications

Install the diversion as soon as the right-of-way has been cleared and graded.

Construct a rolling dip if the road is intended for winter use and use by vehicles with low clearance.

The waterbars and rolling dips should be built at an angle of 45 to 60 degrees from the centerline.

The diversion should have a positive grade of 2% minimum.

The height from channel bottom to the top of the settled ridge shall be 18 inches and the side slopes of the ridge shall be 2:1 or flatter.

The distance it takes for unrocked, unprotected running surface of a nearby road to develop a 1" rill is rough measure of the appropriate spacing distance.

Maintenance

Periodically inspect waterbars and rolling dips.

Inspect before, during and after every rainfall for erosion damage. Immediately remove sediment from the flow area.

Check outlet areas for erosion and make timely repairs as needed.

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PROJECT:
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STORM WATER POLLUTION PREVENTION PLAN - REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

SLOPE DRAIN, ROLLING DIP, AND WATERBAR

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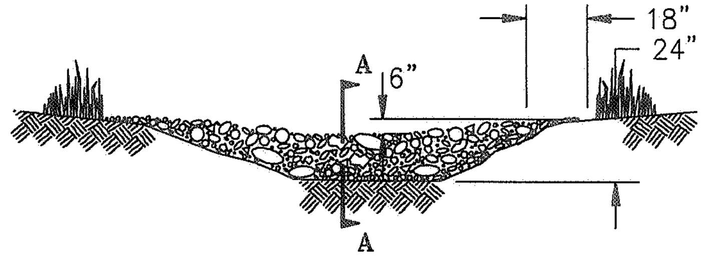
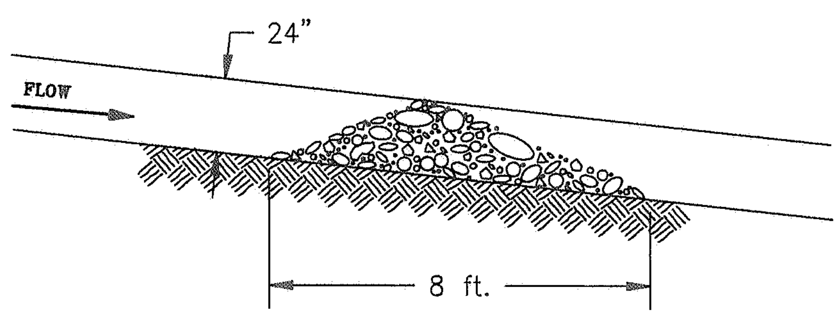
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-11	BMP 11

ROCK CHECK DAM



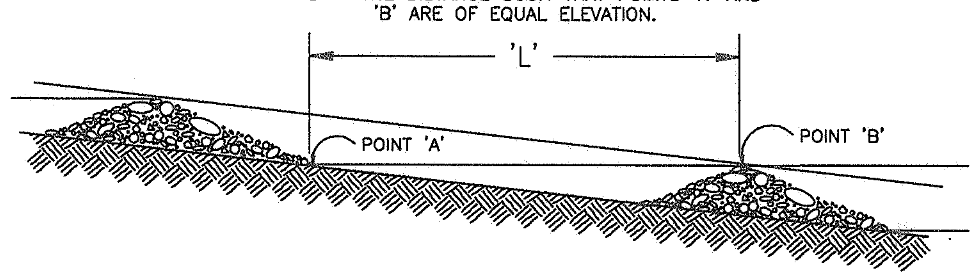
VIEW LOOKING UPSTREAM

NOTE:
KEY STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT OVER FLOW AROUND DAM.



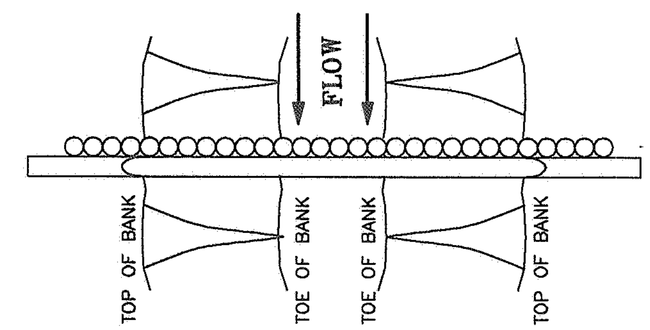
SECTION A – A

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION.

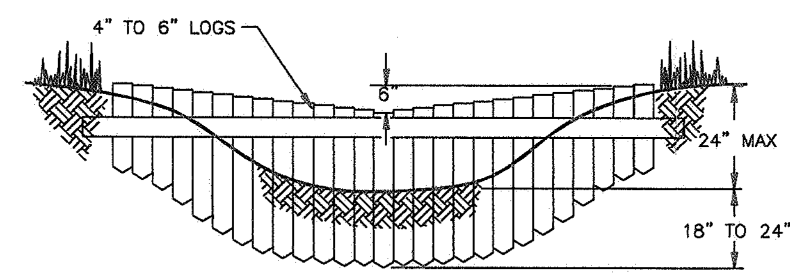


SPACING BETWEEN CHECK DAMS

LOG CHECK DAM

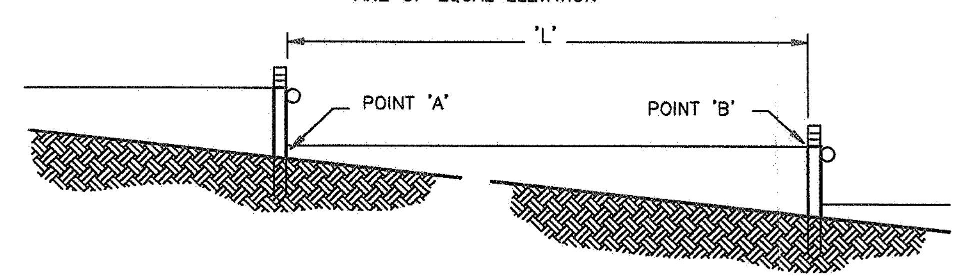


PLAN VIEW



VIEW LOOKING UPSTREAM

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION



SPACING BETWEEN CHECK DAMS

NOTE:
KEY THE ENDS OF THE CHECK DAM INTO THE CHANNEL BANK. LOGS SHALL BE PRESSURE TREATED IF GRADE STABILIZATION STRUCTURE IS INTENDED TO BE PERMANENT.

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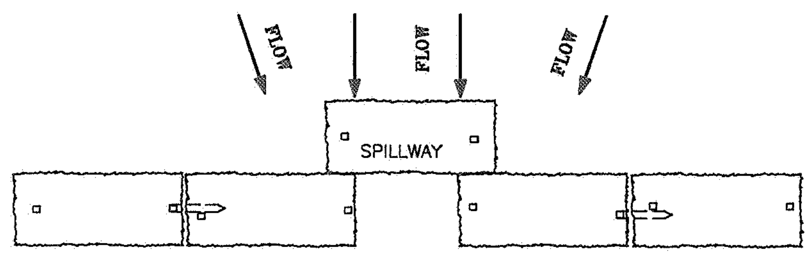
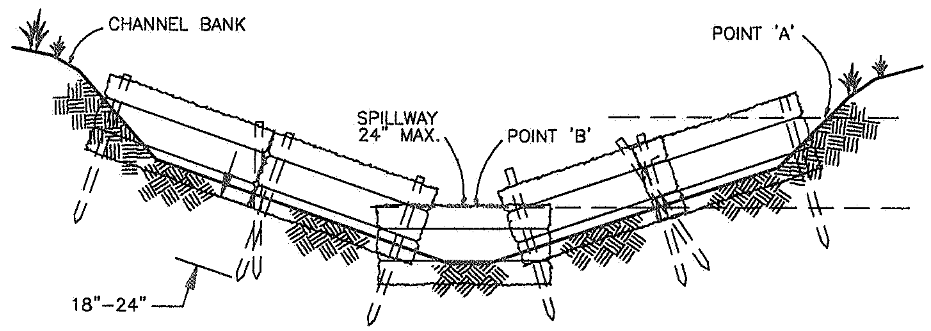
PROJECT: PLAYA VISTA PROJECT	
STORM WATER POLLUTION PREVENTION PLAN – REMEDIAL GRADING EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES	ROCK AND LOG CHECK DAMS
CERTIFIED PROFESSIONAL CAROL L. FORREST, PE CP SOIL EROSION & SEDIMENT CONTROL SPECIALIST CPESC No 665	
URS 1615 MURRAY CANYON ROAD SUITE 1000 SAN DIEGO, CAL 92108 (619) 294–9400	
PREPARED BY: CM	
CHECKED BY:	DATE: 6–1–01
FN: FIG4–12	
PROJECT NO: 5209980033.00–00EC1	
FIGURE NO: 4–12	BMP 12

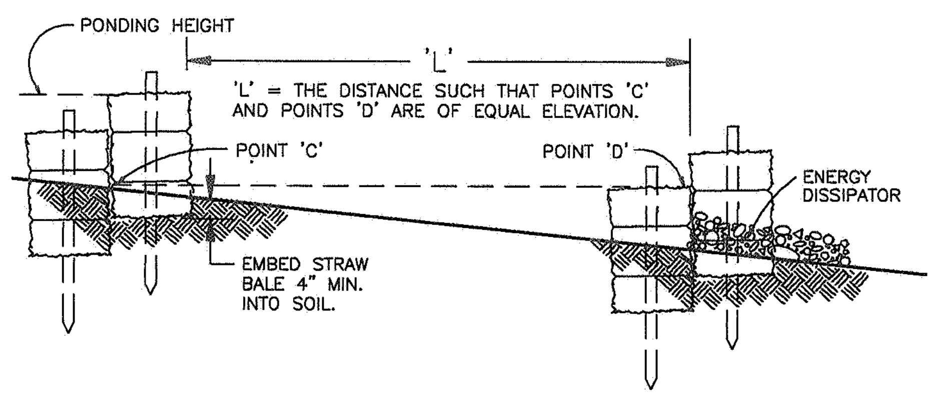
STRAW BALE CHECK DAM



PLAN



VIEW LOOKING UPSTREAM



SECTION A – A
SPACING BETWEEN CHECK DAMS

NOTES:

1. EMBED BALES 4" INTO THE SOIL AND 'KEY' BALES INTO THE CHANNEL BANKS.
2. POINT 'A' MUST BE HIGHER THAN POINT 'B'. (SPILLWAY HEIGHT)
3. PLACE BALES PERPENDICULAR TO THE FLOW WITH ENDS TIGHTLY ABUTTING. USE STRAW, ROCKS OR FILTER FABRIC TO FILL ANY GAPS AND TAMP BACKFILL MATERIAL TO PREVENT EROSION OR FLOW AROUND THE BALES.
4. SPILLWAY HEIGHT SHALL NOT EXCEED 24".
5. INSPECT BEFORE, DURING, AND AFTER EACH STORM EVENT, MAINTAIN AND REPAIR PROMPTLY.

ROCK, LOG, AND STRAW BALE CHECK DAMS

Construction Standards

The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

Rock dams shall be constructed of 2 to 15-inch rock.

Keep the center rock (spillway) section at least 6 inches lower than the outer edges.

Extend the abutments 18" into the channel bank.

Straw bales shall be placed in a single row, lengthwise, oriented perpendicular to the flow, with the ends of adjacent bales tightly abutting one another.

Straw bale dams shall be extended such that the bottoms of the end bales are higher in elevation than the top of the middle bale spillway to ensure that sediment-laden runoff will flow over the barrier, and not around it.

Each straw bale shall be embedded in the soil a minimum of 4 inches. Use straw, rocks, or filter fabric to fill any gaps between the bales and tamp the backfill material to prevent erosion under or around the bales.

If the straw bales are wire bound, they should be oriented so the bindings are around the sides rather than along the top and bottom. Wire bindings that are placed in contact with the soil soon disintegrate and may allow the bale to fall apart.

Construct an energy dissapator to reduce downstream erosion.

Inspection and Maintenance

The check dams shall be inspected for damage periodically during the winter and before, during, and every rain event. Prompt repairs shall be made to ensure that the dam is functioning properly. Any erosion caused by flows around the edges of the dam or under the structure shall be corrected immediately.

Remove sediment from behind the dams when they become 60 percent full, or as needed. The removed sediment shall be deposited in an area that will not contribute sediment off site and can be permanently stabilized.

Remove checkdams and stakes when stabilization is complete.

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STORM WATER POLLUTION PREVENTION PLAN – REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

ROCK LOG, AND STRAW BALE CHECK DAMS

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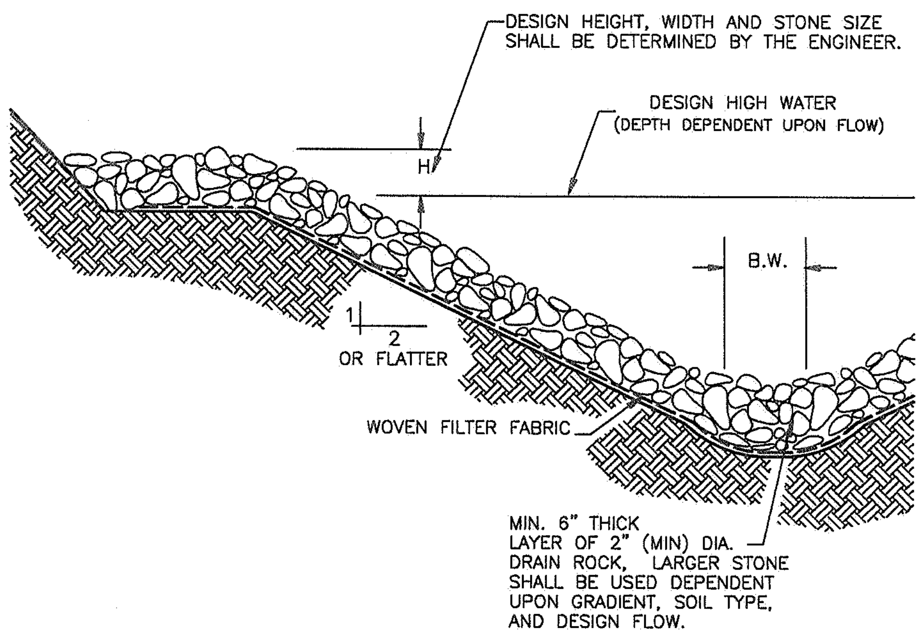
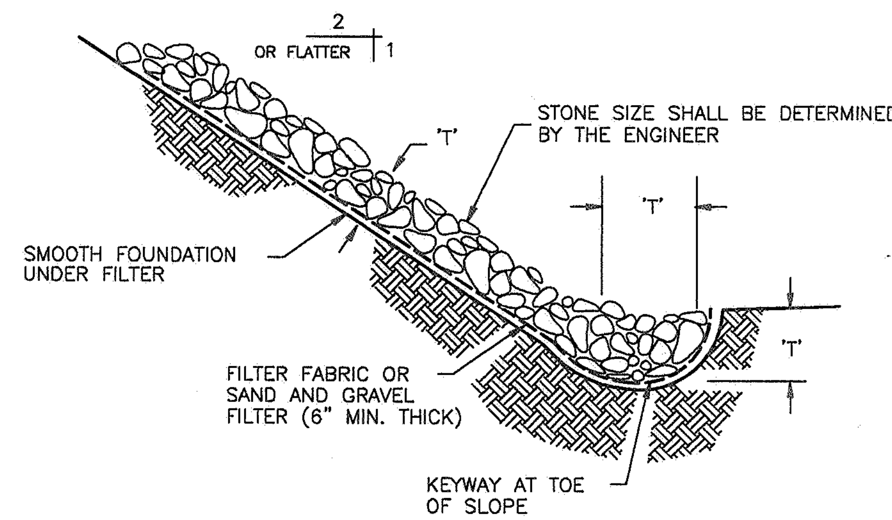
CHECKED BY:	DATE: 6-1-01
FN: FIG4-13	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-13	BMP 13

ROCK LINED CHANNEL



TYPICAL SECTION

RIPRAP PROTECTION



TYPICAL SECTION

NOTE:
'T' = THICKNESS : THICKNESS SHALL BE DETERMINED BY THE ENGINEER.

MINIMUM THICKNESS SHALL BE 1.5x THE MAXIMUM STONE DIAMETER, NEVER LESS THAN 6 INCHES.

ROCK LINED CHANNEL

Construction Specifications

Excavate cross section to the grades shown on plans. Overcut for thickness of rock and filter.

Place filter fabric or gravel filter layer, and rock as soon as the foundation is prepared.

Place rock so it forms a dense, uniform, well-graded mass with few voids. Hand placement may be necessary to obtain good size distribution.

No overfall of channel construction should exist. Grass-lined channels with riprap bottoms must have a smooth contact between riprap and vegetation.

Outlet must be stable.

Use a foundation of extra strength filter fabric or an aggregate filter layer.

Maintenance

Inspect channels at regular intervals and before, during, and after rain event. Remove debris and make needed repairs where stones have been displaced. Take care not to restrict flow area when stones are replaced.

Give special attention to outlets and points where concentrated flow enters channel. Repair eroded areas promptly. Check for sediment accumulation, piping, bank instability, and scour holes and repair promptly.

RIPRAP

Construction Specifications

Before laying riprap and filler, prepare the subgrade to the required lines and grades shown on the plans. Compact any fill required in the subgradde to a density approximating that of the surrounding undisturbed material.

Overfill depressions with riprap.

Remove brush, trees, stumps, and other objectional material.

Cut the subgrade sufficiently deep so that the finished grade of the riprap will be at the elevation of the surrounding area. Channels should be excavated sufficiently to allow placement of the riprap in a manner such that the finished inside dimensions and grade of the riprap meet design specifications.

Place the sand and gravel filter or filter fabric immediately after the ground foundation is prepared. For gravel, spread filter stone in a uniform layer to the specified depth. Where more than one layer of filter material is used, spread the layers with minimal mixing.

Place the filter fabric directly on the prepared foundation. Overlap the edges by at least 12 inches, and space anchor pins every 3 feet along the overlap. Bury the upper and lower ends of the cloth a minimum of 12 inches below ground. Take care not to damage the cloth when placing riprap. If damage occurs remove the riprap and repair the sheet by adding another layer of filter material with a minimum overlap of 12 inches around the damaged area. If extensive damage is suspected, remove and replace the entire sheet.

Where large stones are used or machine placement is difficult, a 4-inch layer of fine gravel or sand may be needed to protect the filter fabric.

Placement of riprap should follow immediately after placement of the filter. Place riprap so that it forms a dense, well-graded mass of stone with a minimum of voids. The desired distribution of stones thoughout the mass may be obtained by selective loading at the quarry and controlled dumping during final placement.

Place riprap to its full thickness in one operation.

Do not place riprap by dumping through chutes or other methods that cause segregation of stone sizes.

Take care not to dislodge the underlying base or filter when placing the stones.

The toe of the riprap slope should be keyed to a stable foundation at its base. The toe should be excavated to the depth about 1.5 times the design thickness of the riprap and should extend horizontally from the slope.

The finished slope should be freee of pockets or small stone or clusters of large stones. Hand placing may be necessary to achieve the proper distribution of stone sizes to produce a relatively smooth, uniform surface. The finished grade or riprap should be apparent.

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STORM WATER POLLUTION PREVENTION PLAN - REMEDIAL GRADING
EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

ROCK LINED CHANNEL AND RIPRAP PROTECTION

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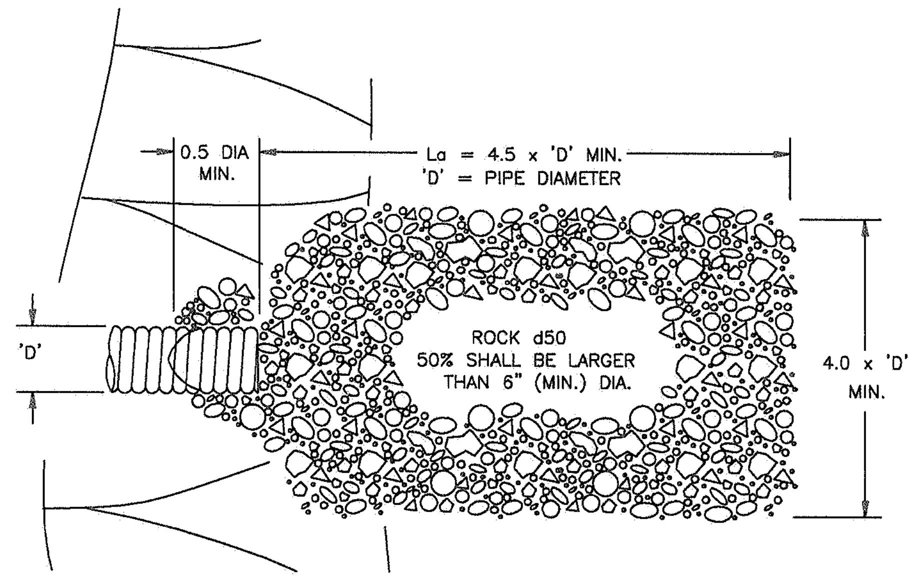
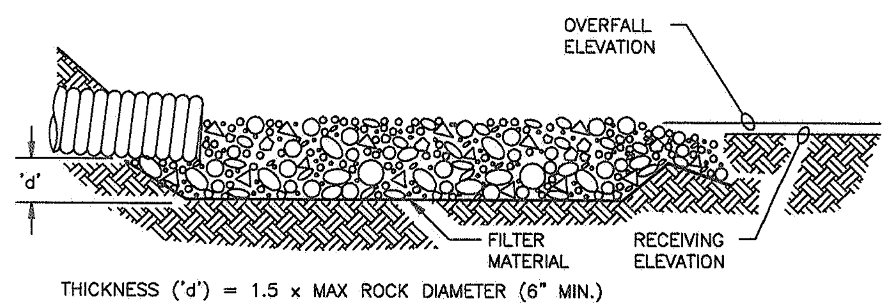
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-14	BMP 14

ENERGY DISSIPATOR



PLAN



SECTION

NOTES:

1. 'La' = LENGTH OF APRON. DISTANCE 'La' SHALL BE OF SUFFICIENT LENGTH TO DISSIPATE ENERGY.
2. APRON SHALL BE SET AT A ZERO GRADE AND ALIGNED STRAIGHT.
3. FILTER MATERIAL SHALL BE FILTER FABRIC OR 6" THICK (MIN.) GRADED GRAVEL LAYER.

ENERGY DISSIPATOR

Construction Specifications

Ensure that the subgrade for the filter and riprap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.

The riprap and gravel filter must conform to the specified grading limits shown on the plans.

Filter cloth, when used, must meet design requirements and be properly protected from punching or tearing during installation. Repair any damaged fabric by removing the riprap and placing another piece of filter cloth over the damaged area. All connecting joints should overlap a minimum of 1 foot.

Riprap may be placed by equipment, but take care to avoid damaging the filter.

The minimum thickness of the riprap should be 1.5 times the maximum stone diameter.

Riprap may be field stone or rough quarry stone. It should be hard, angular, highly weather-resistant and well graded.

Construct the apron on zero grade with no overfall at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.

Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.

Immediately after construction, stabilize all disturbed areas with vegetation.

Outlet must be stable.

Maintenance

Inspect riprap outlet structures before, during, and after every rain event to see if any erosion around or below the riprap has taken place or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

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EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

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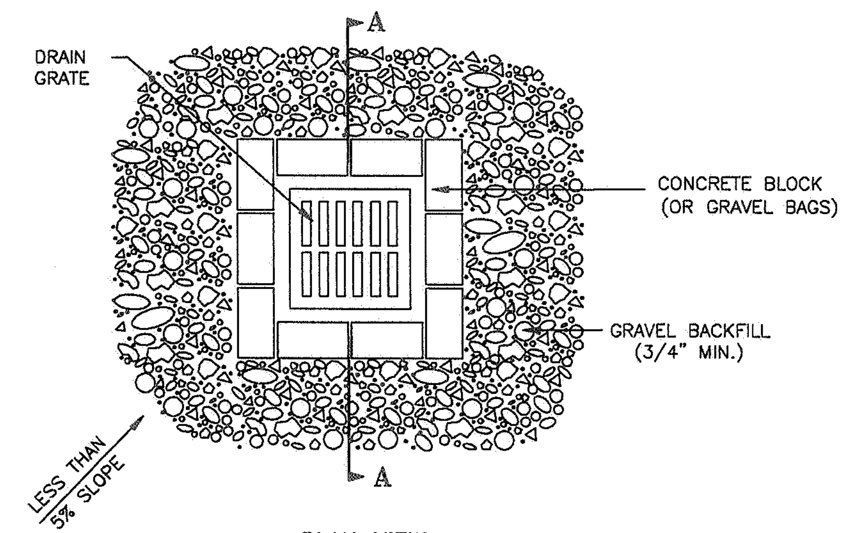
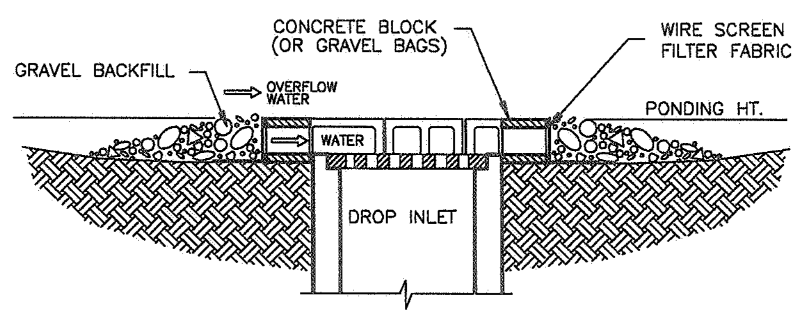
FN: FIG4-15	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-15	BMP 15

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER



PLAN VIEW



SECTION A – A

NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BY-PASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER

Construction Specifications

Identify existing and/or planned storm drain inlets that have the potential to receive sediment laden surface runoff. Determine if storm drain inlet protection is needed, and which method to use.

Methods and Installation

Block and Gravel Filter

Install the block and gravel filters as illustrated. Construct using concrete blocks, 0.5 in to 0.75 in. clean gravel, and geotextile fabrics.

Gravel Bag Barrier

Install the gravel bag barrier as illustrated. Flow from a severe storm should not overtop the curb. In areas of high clay and silts, use filter fabric and gravel as additional filter media. Construct gravel bags in accordance with Sand Bag Barrier installation details.

Inspection and Maintenance

General

Inspect all inlet protection devices before and after every rainfall event, and weekly during the rest of the rainy season. During extended rainfall events, inspect inlet protection devices at least once every 24 hours.

Remove and dispose of deposited sediment properly.

Remove all inlet protection devices within thirty days after the site is stabilized, or when the inlet protection is no longer needed:

- Bring the disturbed area to final grade and smooth and compact it. Appropriately stabilize all are areas around the inlet.
- Clean around and inside the storm drain inlet as it must be free of sediment and debris at the time of final inspection.

Requirements by Method

Block and Gravel Filter

- Make sure the blocks are in good shape and not displaced.
- Check the gravel pile around the blocks to make sure gravel is not washing through the fabric and blocks.
- Do not clean gravel adjacent to any inlet or waterway.
- Remove sediment behind the gravel pack when it reaches one-third the block height.

Gravel Bag Barrier

- Inspect bags for holes, gashes, and snags.
- Check gravel bags for proper arrangement and displacement. Remove the sediment behind the barrier when it reaches one-third the height of the barrier.

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STORM WATER POLLUTION PREVENTION PLAN – REMEDIAL GRADING

EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER

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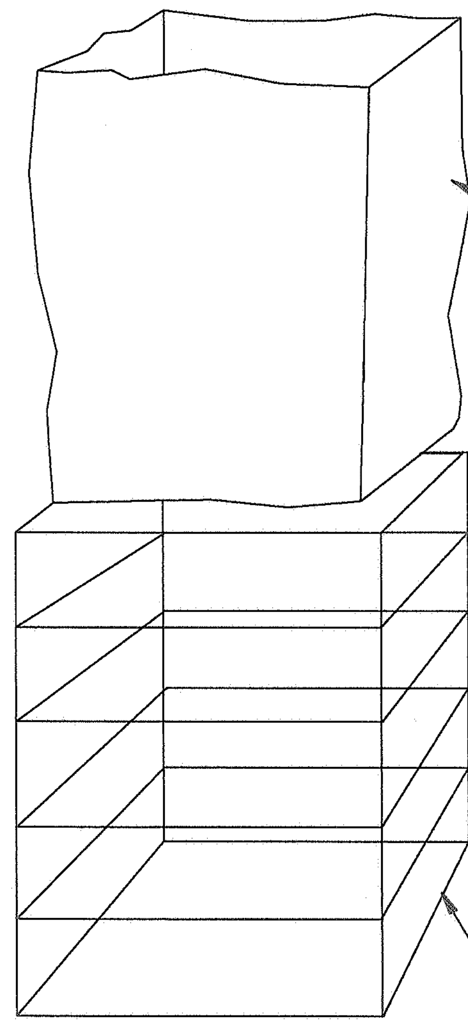
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-16	BMP 16



DROP INLET STORM DRAIN INSERT

Construction Specifications

Insert shall be a flexible storm drain catchment and filtration liner, such as DrainPac or equivalent, designed to collect contaminants and debris from storm water runoff prior to discharge into storm drain systems.

The multi-layer filtration liner shall be comprised of a woven geotextile liner and non-woven filter cloth tested and proven to maximize filtration of sludges containing heavy metals and petroleum hydrocarbons.

The insert support grating shall be comprised of high-density polymer grating, or equilavent, rated at 7500 pounds per foot.

The insert support grating and filter shall be suspended below the drain, and shall not interfere with traffic flow. Hydraulic bypass flapper valves, or equilavent, shall be positioned to prevent flooding.

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DROP INLET STORM DRAIN INSERT

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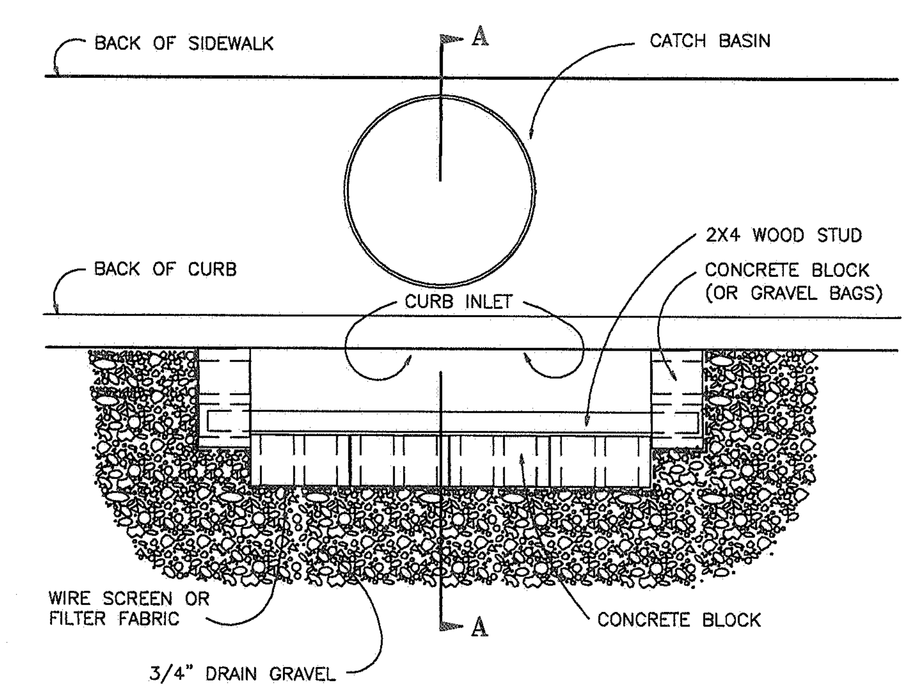
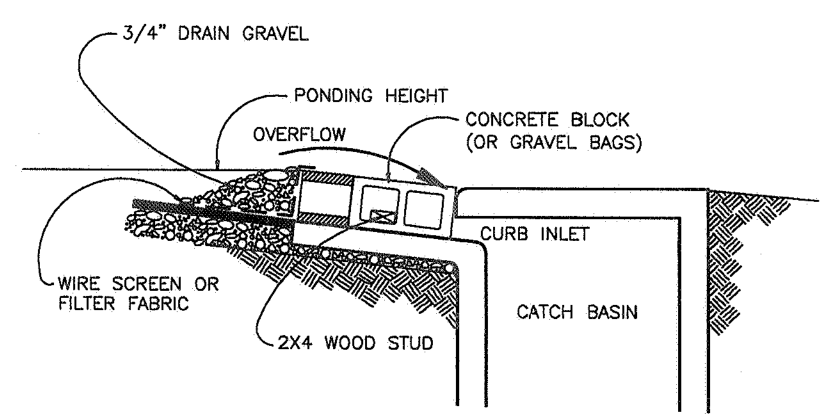
FN: FIG4-17	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-17	BMP 17

CURB INLET SEDIMENT BARRIER



PLAN VIEW



SECTION A – A

NOTES:

1. USE BLOCK AND GRAVEL TYPE SEDIMENT BARRIER WHEN CURB INLET IS LOCATED IN GENTLY SLOPING STREET SEGMENT, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. BARRIER SHALL ALLOW FOR OVERFLOW FROM SEVERE STORM EVENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

CURB INLET SEDIMENT BARRIER

Construction Specifications

Place the barriers on gently sloping streets where water can pond.

The barriers must allow for overflow from a severe storm event. Slope runoff shall be allowed to flow over blocks and gravel and not be bypassed over the curb.

Place two concrete blocks (or gravel filled bags) on their sides perpendicular to the curb at either end of the inlet opening. These will serve as spacer blocks.

Place concrete blocks (or gravel filled bags) on their sides across the front of the inlet and abutting the spacer blocks. The openings in the blocks should face outward, not upward.

Cut a 2- by 4-inch stud the length of the curb inlet plus the width of the two spacer blocks. Place the stud through the outer hole of each spacer block to help keep the front blocks in place.

Place wire mesh over the outside vertical face (open ends) of the concrete blocks to prevent stone from being washed through the blocks. Use chicken wire, hardware cloth with 1/2 inch openings, or filter fabric.

Place 3/4 inch to 1-1/3 inch gravel against the wire to the top of the barrier.

Inspection and Maintenance

Inspect and clean the barrier before, during, and after every rain event, and remove sediment from behind the structure after every storm.

Any sediment and gravel shall be immediately removed from the traveled way of roads.

The removed sediment shall be placed where it cannot enter a storm drain, stream, or be transported off site.

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EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES

CURB INLET SEDIMENT BARRIER

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PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-18	BMP 18

SPILL PREVENTION AND CONTROL PROCEDURES

Spills and leaks are some of the largest sources of storm water pollutants and are, in most cases, avoidable.
Avoiding spills and leaks is preferable to cleaning them up after they occur. Heavy equipment (e.g., bulldozers and other grading equipment) and vehicles should be inspected daily (or as often as possible) for leaks and should be repaired as necessary.
Despite precautions, spills may still occur at the site.
Spills should never be cleaned up by hosing off the area.
In the event that spills occur, they should be controlled as follows:

Minor Spills
Minor spills typically involve small quantities of oil, gasoline, paint, etc. that can be controlled by the first responder at the discovery of the spill. Control of minor spills involves:

1. Contain the spill.
2. Recover spilled materials (if possible).
3. Clean the contaminated area and dispose of contaminated materials.

Medium-Sized Spills
Medium-sized spills still can be controlled by the first responder, along with the aid of other personnel such as laborers, foremen, etc. This response may require the cessation of other activities. Spills should be cleaned up immediately, as follows:

1. Notify the project foreman immediately.
2. Contain the spread of the spill (using sand bags or other barriers).
3. If the spill has occurred on a paved or impermeable surface, clean it up using dry methods (absorbent materials, cat litter, and/or rags). Contain the spill by encircling it with absorbent materials.
4. If the spill has occurred on an unpaved or permeable surface, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
5. If the spill has occurred during a rain event, cover the area if possible.

Significant/Hazardous Spills
For large spills or spills involving hazardous materials that cannot be controlled by project personnel, the following steps should be taken:

1. The Foreman should notify the Project Superintendent immediately and follow up with a written incident report.
2. The Project Superintendent will notify local emergency response personnel by dialing 911. In addition, the Project Superintendent will notify the appropriate County officials. It is the Project Superintendent's responsibility to have all of the emergency phone numbers at the construction site.
3. The Project Superintendent will also notify the California Office of Emergency Services.
4. For spills of federal Reportable Quantity (as established under 40 CFR Parts 110, 117, or 302), the Project Superintendent will notify the National Response Center by telephone at (800) 424-8802 within 24 hours. Within 14 days, the Project Superintendent will submit a written description of the release to EPA Region 9, including the date and circumstances of the incident and steps taken to prevent another release.
5. Retain the services of a Spill Cleanup Contractor or HazMat Team immediately. Construction personnel should not attempt to clean up the spill until the appropriate and qualified staff has arrived at the site.
6. Other agencies that may need to be contacted include the Fire Department, Highway Patrol, Department of Toxic Substances Control, etc.

PAVING OPERATIONS CONTROLS

In order to reduce the potential for the transport of pollutants in storm water runoff from paving operations, paving will not take place within 72 hours of a predicted significant (>0.25") storm event. If paving does occur within 72 hours of a significant storm event, catch basin filters or other appropriate BMPs will be utilized to trap hydrocarbons.

VEHICLE AND EQUIPMENT CLEANING, FUELING, AND MAINTENANCE CONTROLS

Vehicles and heavy machinery are a potential source of pollutants such as petroleum products, antifreeze, and exhaust and waste oil containing heavy metals. Pollutants may enter storm water runoff by means of direct contact with machine parts and by contact with spills on surfaces and the ground. The following control measures can help prevent contact of these potential pollutants with storm water and ground surfaces.
Maintenance and fuel storage will be conducted within designated maintenance yards in order to enable careful management. During long periods of storage (>1 mo.) and during minor routine maintenance, drip pans will be placed under vehicles and equipment that are prone to leakage. Plastic tarps will be placed over exposed equipment when not in use for long periods (>3 mos.) to prevent contact with storm water. All on site vehicles will be monitored for leaks and will receive preventive maintenance to reduce leakage.
Vehicles and equipment will be washed off site at a proper wash facility.

On site vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling.
When fueling must occur on site, the contractor shall select and designate an area to be used, subject to approval by Playa Vista. Vehicle fueling areas shall have the following characteristics:
* Located away from storm drain inlets, drainage facilities, or water courses.
* Located on a paved surface where practical.
* Bermed to prevent runon, runoff, and to contain spills.
* Provided with secondary containment techniques, such as drain pans or drop cloths to be used while fueling to catch spills or leaks.
* Provided with vapor recovery nozzles to help control drips and reduce air pollution.
* Provided with nozzles equipped with automatic shutoff features to prevent overtopping fuel tank.
* Provided with a stockpile of spill clean up materials that are readily accessible.

The Contractor should not permit any vehicle or equipment washing at the job site. If an exception is granted by Playa Vista and a Contractor is allowed to wash vehicles outside on site, then the outside cleaning area shall have the following characteristics:
* Located away from storm drain inlets, drainage facilities, or watercourses.
* Paved with concrete or asphalt, or stabilized with an aggregate base.
* Bermed to contain wash waters and to prevent runon and runoff.
* Configured wash area with a sump to allow collection and disposal of wash water.* Discharges wash water to a sanitary or process waste sewer (where permitted), or to a dead end sump. Wash waters shall not be discharged to storm drains or watercourses.
* Used only when necessary.
Additionally, when cleaning vehicles or equipment with water.
* Use as little water as possible. High pressure sprayers may use less water than a hose, and should be considered.
* Use positive shutoff valve to minimize water usage.
* Do not use solvents or detergents to clean vehicles or equipment on site.
* Do not permit steam cleaning on site.

CONCRETE MANAGEMENT

Whenever possible, concrete trucks will be washed out offsite in designated areas. If washout must occur on site, wash water will be contained in a temporary pit. Upon completion of the concrete work, the Contractor will break up, remove, and haul away or reuse on site solid concrete that has accumulated in the washout pit. Washing of fresh concrete will be avoided, unless runoff can be drained to a bermed or level area, away from storm drain inlets and channels.

MANAGEMENT OF PESTICIDES AND FERTILZERS

Apply pesticides only as specified on the "Pesticide Use Recommendation" on the label. The pesticide label is considered to be the law. Use of a pesticide inconsistent with the label is considered to be a violation. Minimize the use of pesticides in and near the storm drainage system or watercourses. Record the use of all pesticides. Avoid applying pesticides prior to a predicted rain event.

If possible, use only natural, organic fertilizers and apply them with a drop spreader. Do not over-irrigate following fertilizer application. Apply only the type and quantitiy of fertilizer needed based on the fertility of the soil and the type of vegetation. Do not apply fertilizer prior to a predicted rain event.

WASTE MANAGEMENT PRACTICES

There will be designated temporary waste storage areas on the site. The sites will be contained within earthen berms. Non-hazardous construction wastes (e.g., vegetation, trash, and construction debris) will be collected from throughout the site once a day and before storm events and deposited in central piles at the designated waste storage areas. When practical, wastes will be stored within covered dumpsters. All waste materials will be removed from the storage areas by the Contractor or a licensed subcontractor on a weekly basis and transported to an offsite landfill or to the appropriate recycling facility. The disposal of excess material offsite will comply with all Federal, State, and local regulations.

MEASURES TO ENSURE COMPLIANCE WITH STATE OR LOCAL DISPOSAL, SANITARY SEWER, OR SEPTIC SYSTEM REGULATIONS

All sanitary wastes will be collected and managed through the use of portable toilet facilities. Portable toilets will be transported to and from the construction site by a licensed contractor. No sanitary wastes will be disposed of onsite. To the extent practicable, portable toilets will be placed a safe distance away from paved areas or provided with sand bag berms to guard against accidental overturning of them onto paved areas by vehicles.

CONTAMINATED SOIL MANAGEMENT

A number of practices occurring during construction may lead to contamination of soils. For example, leaks and spills of petroleum products from leaking vehicles and routine vehicle and equipment maintenance can cause soil contamination. All contaminated soils must be removed and disposed of correctly. In the event that soil contamination is suspected but not confirmed, the contractor will obtain samples for analysis by a certified analytical laboratory. Decisions regarding soil removal and disposal will be based on the results of the analysis. No contaminated soils shall be buried or otherwise disposed on site.

MATERIAL DELIVERY AND STORAGE CONTROLS

Many materials used in construction can contribute pollutants to storm water runoff. Examples of such materials include soil, vehicle fuels, oils, antifreeze, fertilizers, pesticides, and herbicides. Construction materials shall be stored in a manner to prevent or minimize contact with storm water. All construction materials shall be delivered to and stored in designated areas at the construction site. The main loading, unloading, and access areas shall be located away from storm drain inlets and channels. The Contractor shall construct enclosures or flow barriers (berms) around these areas to prevent storm water flows from entering storm drains or receiving waters, and to control the discharge of sediments and other pollutants.

TRAINING

When properly trained, site personnel are more capable of managing materials properly, preventing spills, and implementing control practices efficiently and correctly. Personnel at all levels should be trained in the components and goals of the permit. The following measures will be followed to ensure the SWPPP is effectively implemented, BMP inspections are performed, BMP maintenance and repair are performed, and appropriate records are prepared and retained:
* Before beginning construction activities and periodically during construction, appropriate Playa Vista personnel and contractor personnel will receive training to implement the SWPPP effectively, perform BMP inspections, perform BMP maintenance and repair, and keep records. Non-storm water discharges and general contractor activity BMPs will also be covered during training. An appropriate forum for training would be "tailgate meetings" that focus generally on the components and goals of the SWPPP, and specifically on the implementation, inspection, and maintenance of the storm water pollution control BMPs.
* Individuals responsible for overseeing, revising, and amending the SWPPPs will also document their training.
* All appropriate new employees and contractors will be trained by staff who are familiar with the SWPPP requirements before they will be permitted to work at the site. Contractors will be responsible for informing their subcontractors about SWPPP requirements.
* BMP drawings, fact sheets, or other specifications will be copied and distributed to contractors and site personnel engaged in the activity in question and/or installation/maintenance of BMPs.

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PLAYA VISTA PROJECT

STORM WATER POLLUTION PREVENTION PLAN
EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS AND NOTES
NON-STORMWATER MANAGEMENT

CERTIFIED PROFESSIONAL
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CPESC No 665

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1615 MURRAY CANYON ROAD
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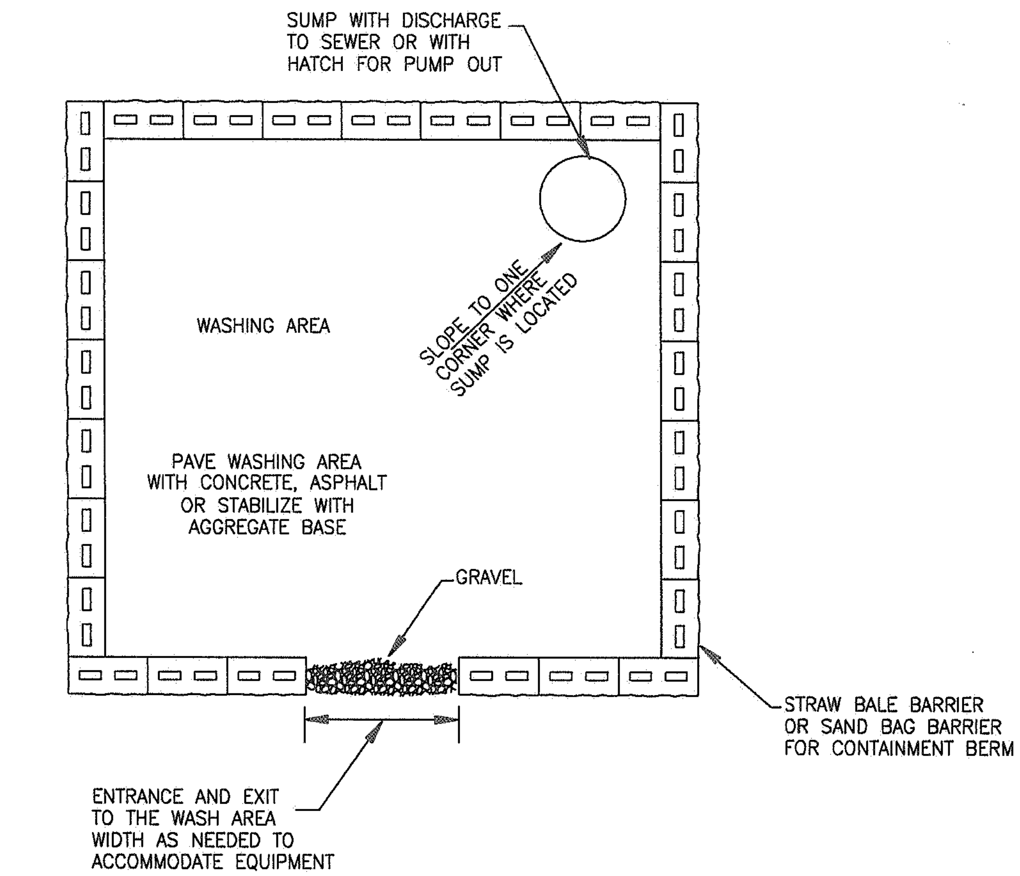
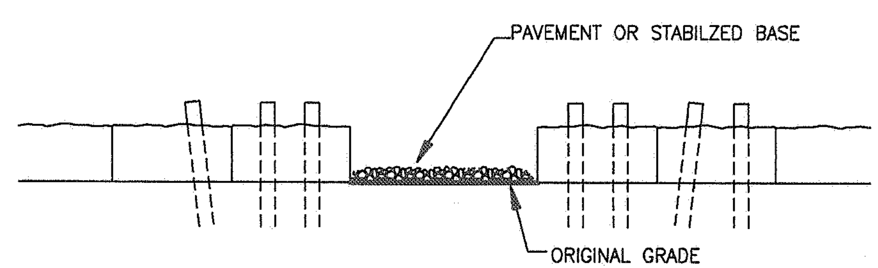
SAN DIEGO, CAL 92108
(619) 294-9400

PREPARED BY: CM	
CHECKED BY:	DATE: 6-1-01
FN: FIG4-19	
PROJECT NO: 5209980033.00-00EC1	
FIGURE NO: 4-19	BMP 19

VEHICLE AND EQUIPMENT CLEANING



PLAN



FRONT ELEVATION

VEHICLE AND EQUIPMENT CLEANING

Vehicles and equipment will be washed off site at a proper wash facility. The Contractor should not permit any vehicle or equipment washing at the job site. If an exception is granted by Playa Vista and a Contractor is allowed to wash vehicles outside on site, then the outside cleaning area shall meet the following specifications:

Construction Specifications

Clean off site all vehicles/equipment that regularly enter and leave the construction site.

When vehicle/equipment washing/cleaning is approved by Playa Vista to occur on site, and the operation cannot be located within a structure or building equipped with sanitary sewer facilities, the outside cleaning area shall have the following characteristics:

- Located away from storm drain inlets, drainage facilities, or watercourses.
- Paved with concrete or asphalt, or stabilized with an aggregate base.
- Bermed to contain wash waters and to prevent runon and runoff.
- Configured wash area with a sump to allow collection and disposal of wash water.
- Discharges wash water to a sanitary or process waste sewer (where permitted), or to a dead end sump. Wash waters shall not be discharged to storm drains or watercourses.
- Used only when necessary.

When cleaning vehicles/equipment with water:

- Use as little water as possible. High pressure sprayers may use less water than a hose, and should be considered.
- Use positive shutoff valve to minimize water usage.

Do not use solvents or detergents to clean vehicles/equipment on site.

Do not permit steam cleaning on site.

Inspection and Maintenance

The control measure should be inspected before, during, and after every rain event.

Service sump regularly

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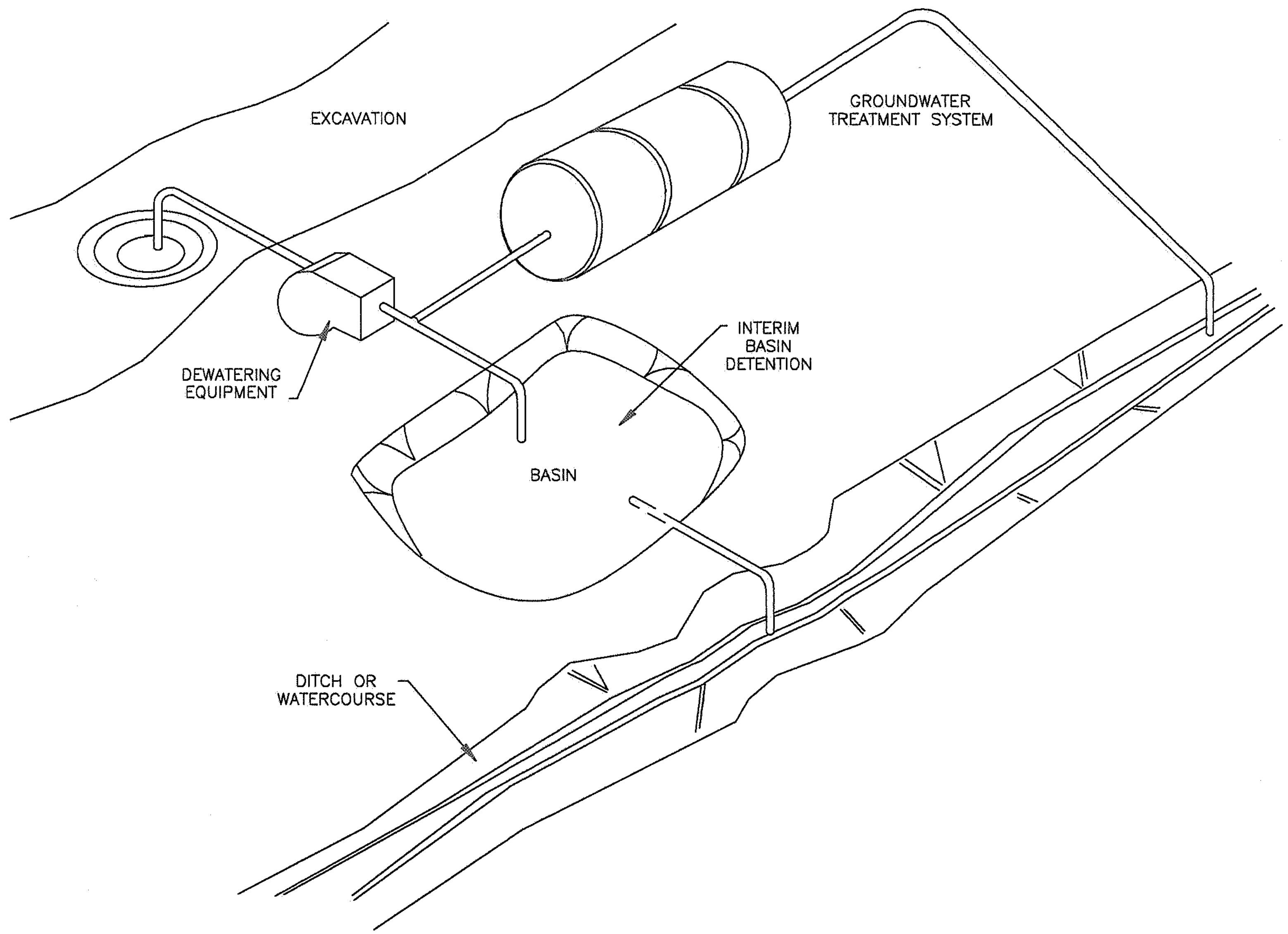
FIGURE NO: 4-20	BMP 20



PONDED WATER MANAGEMENT

Construction Specifications

Ponded storm water shall be settled or filtered for sediment removal, and tested if other contaminants are potentially present.

If the water is determined to be uncontaminated, it shall be pumped to the Interim Detention Basin or directly to the storm drain upon approval by the site engineer.

If the ponded water is determined to be contaminated, it shall be pumped to the Groundwater Treatment System.

Water used for utility line testing or flushing shall be dechlorinated prior to discharge.

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FN: FIG4-21

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FIGURE NO: 4-21

BMP 21