4.7 Hydrology and Water Quality

Overview

Any large development involving substantial construction has the potential to affect hydrology - the way water behaves on the site. In the case of LAX, parking lots, runways, terminals and other impervious surfaces may increase runoff of storm water, increasing the potential for localized flooding, or reduce the recharging of groundwater. This section also analyzes such hydrologic effects, as well as the related potential for water runoff to affect water quality by washing pollutants into nearby ocean waters or water courses.

Key Conclusions

Overall Hydrologic Impact of Build Alternatives: Although each build alternative would increase impervious area, no significant impacts would occur for localized flooding or groundwater recharge for any of the Master Plan alternatives. The potential for significant impacts exists but Master Plan Commitments, design standards, performance standards and regulations would keep the impacts below the threshold of significance.

Existing Drainage: Under the Environmental Baseline and the No Action/No Project Alternative, the existing on-site drainage system would continue to provide inadequate protection against flooding, which would not be alleviated by an Environmental Action Plan as would the Master Plan build alternatives. Approximately 83 percent of the area within the Master Plan boundary is already characterized as impervious surface. Surface runoff flows to an extensive network of Los Angeles City and County drainage facilities that discharge either directly to Santa Monica Bay or to San Pedro Bay via the Dominguez Channel. Storm water runoff from within the airport property drains to the Dominguez Channel as well as to the Argo Drain, the Imperial Drain, and the Culver Drain, which are sub-basins of the Santa Monica Bay Watershed. It is estimated that most of the existing storm drains at LAX do not have sufficient capacity to convey the peak runoff rates for a 50-year design storm. Some of the existing storm drains are estimated to have capacity sufficient to only convey runoff generated by a 1-year to 5-year design storm.

Off-Site Drainage: Although implementation of the Environmental Action Plan would address significant project-related drainage impacts on LAX property, there is the potential for significant cumulative drainage impacts at off-site locations due largely to past projects including development at LAX as well as projects outside of the airport that have increased surface runoff flows beyond the capacity of the existing storm drain system. While it is likely that drainage system improvements and other solutions are available to address the existing drainage and flooding problems, the responsibility for mitigation lies with other agencies.

Recharging of Groundwater: Groundwater beneath LAX is not used for municipal or agricultural purposes. Therefore, any impact of the Master Plan alternatives on the groundwater recharge rate would not be significant. The nominal decreases in surface recharge occurring under each alternative would have no notable effect on the West Coast Groundwater Basin and no significant impacts would occur.

Water Quality: Water runoff from the airport flows into two “receiving water bodies,” the Santa Monica Bay and the Dominguez Channel. As the water flows across the airport it picks up various types of pollutants including suspended solids such as dust and dirt, nutrients (phosphorus and nitrogen) from landscape fertilizers, heavy metals, oil and grease from roads and parking lots; and other contaminants.

Water Quality Impacts of Storm Water: With measures to be selected and implemented under LAWA’s Hydrology and Water Quality Master Plan Commitment, there would be no significant impacts on water quality from storm water runoff.

- The greatest overall potential increase in annual pollutants would occur under the No Action/No Project Alternative with increases in all of the modeled pollutants ranging from approximately 3 to 11 percent compared to Baseline Conditions.
- Alternative A would result in an increase of approximately 1 to 10 percent for phosphorus, metals, oil and grease, chemical oxygen demand.
- Alternative B would increase by approximately 8 percent for metals and 7 percent for oil and grease.

- Alternative C would also increase pollutant loads before mitigation by approximately 3 to 8 percent for metals and 8 percent for oil and grease.

Water Quality Impacts of Dry Weather Runoff: These types of runoff are generated by activities including outdoor maintenance, landscape irrigation, aircraft and vehicle washing and servicing, washing of paved areas, etc. The characteristics of dry weather flows would vary under each of the alternatives. Under the build alternatives, many of the existing maintenance facilities at LAX would be relocated off-site, consequently reducing the number of sources for dry weather pollutants when compared with the Environmental Baseline. No significant water quality impacts associated with dry weather flows are expected to occur for any of the alternatives.

Water Quality Detention Basin: Implementation of any of the build alternatives would result in the removal of an existing water runoff detention basin located within the Imperial drainage area. Water captured in the basin is treated to remove pollutants. However, implementation of the Environmental Action Plan for this topic would compensate for loss of the water quality treatment function of the basin.

Environmental Action Plan

Hydrology: Recognizing that any increase in runoff could create or exacerbate flooding, the Master Plan includes a commitment to develop a detailed drainage plan for assessing site-specific drainage flows and identifying appropriate measures to alleviate existing drainage deficiencies, while also accommodating future Master Plan-related increases in runoff. In addition, a measure is proposed that would fully mitigate impacts associated with the LAX Expressway and State Route 1 improvements. The Master Plan, as an overall long-term development program for LAX, provides the means and opportunity to address localized flooding within the airport property in a comprehensive and systematic manner. In so doing, the drainage impacts associated with each of the build alternatives would be reduced to a level less than significant.

Water Quality: To address and reduce the water quality impacts of the project, the Master Plan commitment noted above for developing a detailed drainage plan would include a water quality component. Measures to be included would be based on the Los Angeles Regional Water Quality Control Board's *Standard Urban Storm Water Mitigation Plan.* The Storm Water Mitigation Plan addresses water quality and drainage issues by specifying best management practices related to controlling the sources of pollution and the treatment of pollutants, in order to reduce, to the maximum extent practicable, discharge of pollutants into receiving water bodies. In addition to formalizing source control measures as part of Master Plan implementation, integration of the Storm Water Mitigation Plan measures into the development of a detailed drainage plan offers LAX the opportunity to include structural water quality treatment systems into a comprehensive drainage system upgrade. Structural water quality treatment systems such as filtering devices, detention basins, bioretention and infiltration systems, etc. might otherwise be infeasible and/or less effective to retrofit on the existing system. With implementation of this Master Plan commitment, the water quality impacts of any build alternative would be reduced to a level less than significant.

Related Topics

For information regarding floodplains, see Section 4.13, *Floodplains*, and for discussion of seismically induced hazards, see Section 4.22, *Earth/Geology*.

For additional information regarding potential impacts to groundwater quality, see Section 4.23, *Hazardous Materials*. Regarding impacts associated with wastewater flows, see Section 4.25.2, *Wastewater*.

4.7.1 Introduction

The hydrology analysis addresses the potential for flooding to occur and the effects of surface recharge on groundwater. The water quality analysis addresses the quality of storm water runoff and dry weather flows. Detailed information regarding these analyses is provided in Technical Report 6*, Hydrology and Water Quality Technical Report*. Potential Impacts associated with wastewater flows are addressed in Section 4.25.2, *Wastewater*. Changes in the groundwater quality due to the LAX Master Plan are addressed in Section 4.23, *Hazardous Materials*. Impacts associated with floodplains are addressed in Section 4.13, *Floodplains*. Impacts associated with seismically induced hazards are covered in Section 4.22, *Earth/Geology*.

4.7.2 General Approach and Methodology

The various sources and methodologies used for the hydrology and water quality analyses are identified below. Additional details regarding these sources and methodology are provided in Technical Report 6*, Hydrology and Water Quality Technical Report.*

This analysis compares drainage, recharge, and water quality conditions projected for the No Action/No Project Alternative and three build alternatives to baseline conditions. The analysis estimates baseline conditions for the airport, as well as for areas proposed to be acquired as part of the LAX Master Plan or other airport programs, collectively referred to here as the Hydrology and Water Quality Study Area (HWQSA).

The acreage and location of land required for the proposed Master Plan improvements are unique to each of the three build alternatives. Consequently, each alternative would result in a different footprint for LAX. In order for baseline conditions, the No Action/No Project Alternative, and the three build alternatives to be compared side by side, a single hydrology and water quality study area was used. The study area for this analysis (referred to as the Hydrology and Water Quality Study Area) includes the existing LAX property, two areas currently being acquired by Los Angeles World Airports (LAWA) under the Aircraft Noise Mitigation Program (consisting of Belford and Manchester Square, and collectively referred to as the "ANMP" properties) and areas adjacent to LAX that are being considered for acquisition under one of the three Master Plan alternatives. Impacts associated with the two alternative sites being considered for construction of an off-site fuel farm under Alternative B are discussed qualitatively herein and separately from the Hydrology and Water Quality Study Area. Impacts resulting from the construction of ground access improvements, including land within the right-of-way of the LAX Expressway and improvements to State Route 1, are addressed in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements.* Storm water runoff, groundwater recharge, and pollutant loads within the study area were then calculated (as described below) for baseline conditions and for all alternatives at the 2005 and 2015 planning horizons.

Under baseline conditions, land within the ANMP acquisition areas is evaluated based on its existing use; under the No Action/No Project Alternative, it is assumed to be vacant. For each of the build alternatives, it is assumed that all proposed acquisition has been completed and existing land uses demolished. Each alternative proposes a different configuration of land acquisition; thus, not all land within the HWQSA would be acquired by any one alternative. Land not acquired would not be affected by the Master Plan.

Hydrology

The analysis of hydrology considered potential changes in storm water runoff (i.e., drainage) resulting from the Master Plan alternatives, as well as potential changes to groundwater recharge resulting from the decrease in pervious surfaces. The methodology used in each of these analyses is described below.

Drainage

The objective of the drainage analysis is to assess the potential for localized flooding to occur under the No Action/No Project Alternative and three build alternatives when compared to baseline conditions. This comparison is made indirectly, using changes in impervious surface area. Typically when evaluating drainage, the peak flow rate for the proposed drainage system is calculated and compared to the design capacity of the existing drainage system using the City of Los Angeles Peak Rate Method. This method requires detailed maps of storm water conveyance structures so that drainage sub-basins, catch basins, storm drains, and other features can be identified. For future conditions, this level of information is not available. Also, drainage patterns under baseline conditions are not expected to resemble drainage patterns under the future build conditions since in some areas, the slopes and areas of the drainage basins are expected to change. Without detailed maps identifying the storm drain infrastructure under the future build conditions, the drainage area, time of concentration, flow routing and conveyance capacities cannot be accurately estimated, and therefore, do not provide a means to reasonably evaluate drainage and the potential for flooding using the Peak Rate Method or any other Rational Method-based approach. However, land use changes under the Master Plan alternatives can be evaluated. This method is appropriate since surface water flow rates in urban regions are a function of impervious area.

For this analysis, impervious area was quantified for the areas within the HWQSA draining to the Santa Monica Bay and Dominguez Channel. Using these drainage areas and holding constant all parameters other than land use, a change in land use that would produce a change in the amount of impervious area would produce a corresponding change in storm water peak flow rates. As described in 4.7.3, *Affected*

Environment/Environmental Baseline, many of the existing storm water conveyance facilities at the airport generally do not have adequate capacity to convey peak runoff rates based on the design requirements of the City of Los Angeles. Therefore, any increase in the amount of impervious area would produce an increase in peak flow rates, potentially exceed the design capacity of the drainage structure, and increase the likelihood of flooding. Therefore, for the purposes of this analysis, changes in impervious area are used as a surrogate to assess potential increases in surface water runoff flow rates and, consequently, the potential for flooding. Impervious factors for the different types of land use were obtained from the *City of Los Angeles Storm Drain Design Manual*[263] (LASDDM). This manual provides impervious factors based on land development and zoning classifications. The development and zoning classifications were used to assign impervious factors to the corresponding land uses identified on the layouts and in the Westchester – Playa del Rey Plan.[264] Details regarding the development of impervious factors used in this analysis are presented in Technical Report 6*, Hydrology and Water Quality Technical Report.* On-airport land uses were identified by reviewing the proposed airport layouts associated with the three build alternatives. Off-airport land uses within the HWQSA were identified using the WPDRP[265] for community development.

Recharge

Surface recharge occurs when precipitation or surface water runoff contacts pervious surfaces and infiltrates through the subsurface to replenish groundwater in aquifers below. The effects of the Master Plan alternatives were evaluated by comparing the volume of surface water recharge within the HWQSA under the No Action/No Project Alternative and the three build alternatives to baseline conditions.

An annual average recharge rate for pervious surfaces was estimated by dividing the known surface recharge volume for the West Coast Groundwater Basin, in which LAX is located, by the pervious area for the entire Basin. The recharge rate quantifies the recharge in terms of volume per unit area for the entire Basin. This method results in a conservative recharge rate because it includes recharge from streams and rivers that recharge other areas of the Basin, but are not present within the HWQSA.

To calculate the annual volume of surface water recharge within the HWQSA, the average annual recharge rate was assumed to occur through the pervious area estimated for the No Action/No Project Alternative and the three build alternatives. Pervious area within the HWQSA was determined by subtracting the total area by the amount of impervious area estimated under each alternative as described in the drainage evaluation. Details regarding the calculation of the recharge rate for pervious surfaces in the Basin are presented in Technical Report 6*, Hydrology and Water Quality Technical Report.*

Water Quality

The water quality analysis compares the estimated surface water pollutant loads under the No Action/No Project Alternative and three build alternatives to surface water pollutant loads under baseline conditions. The baseline analysis estimates the existing on-airport pollutant load, as well as that associated with other areas within the HWQSA. Pollutant loads associated with wet weather flows were estimated quantitatively, while pollutant loads due to dry weather flows were addressed qualitatively by characterizing the practices that contribute to these flows.

Estimating the mass of pollutant load transferred to a water body requires knowledge of surface water runoff volume, discharge location, and pollutant load sources for a given area. Pollutants transferred out of the study area by wet weather flows are the result of non-point pollution sources. The most accurate method to estimate pollutant loads for this type of pollution is to collect and analyze samples of runoff directly from the project site. However, because pollutant concentrations in storm water runoff vary based on a number of short and long-term seasonal factors, including total rainfall, storm duration, intensity, and frequency among others, several years are typically required to collect a sufficient number of samples to produce statistically significant results. Alternately, pollutant loads are commonly assessed on an average annual basis using average pollutant concentration data from other published storm water investigations.

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263 City of Los Angeles Department of Public Works, Storm Drain Design Manual-Part G, 1973.

264 City of Los Angeles, Westchester – Playa del Rey Plan, December 1990.

265 City of Los Angeles, Westchester – Playa del Rey Plan, December 1990.

The United States Environmental Protection Agency's (USEPA) National Urban Runoff Program's (NURP) Final Report presents the results of an extensive runoff sampling and analysis program that consisted of collecting samples from more than 2,300 separate storm events.[266] In part, the NURP report concluded that pollutant concentrations in urban runoff can be characterized as a function of land use using Event Mean Concentrations (EMCs).[267] Land use categories analyzed in the report include residential, mixed use, commercial, and open space/nonurban. Similar investigations have been conducted by the Federal Highway Administration[268] (FHWA) for highways and the American Association of Airport Executives and the Airport Research and Development Foundation for airports.[269]

Local data have been compiled by several municipalities that have participated in an extensive storm water monitoring program to support storm water quality management programs in Los Angeles County. These data were compiled and evaluated statistically to provide estimations of the pollutant runoff concentrations for storm water runoff samples for land use categories within the county.[270]

The pollutants of concern evaluated in this analysis were based upon studies of the Santa Monica Bay, the primary receiving water body for runoff from LAX. According to the *Characterization Study of the Santa Monica Bay Restoration Plan – State of the Bay 1993*,[271] 19 pollutants of concern have been identified for the Santa Monica Bay. However, only nine of these pollutants are expected to be associated with storm water runoff from LAX. These pollutants include total suspended solids, phosphorus, total kjedahl nitrogen, copper, lead, zinc, biochemical oxygen demand, chemical oxygen demand, and oil and grease. Pollutant loads discharged to the Santa Monica Bay and the Dominguez Channel receiving water bodies were calculated by multiplying pollutants' EMCs and average annual runoff. Average annual runoff volumes were calculated from average annual precipitation, drainage area, and runoff coefficients and impervious fractions.[272] The rationale for the selection of EMCs and pollutants of concern for the various land uses is presented in Technical Report 6*, Hydrology and Water Quality Technical Report*.

Dry-weather flows are flows not resulting from precipitation, usually low-volume and low-velocity. The quality of these flows and the type of pollutants associated with them are largely a function of the flow source, rather than the land uses the flows contact enroute to the receiving body. Sources of dry weather flows at airports include outdoor maintenance of vehicles, buildings, and grounds; aircraft and ground vehicle fueling; painting, stripping, washing, and deicing; and chemical and fuel transport and storage. Pollutants most expected to be present in dry weather flows at the airport are generally associated with fueling and maintenance activities and include fuels (gasoline, diesel, and Jet A) and oil and grease. Other pollutants associated with dry weather sources at the airport are discussed in Technical Report 6*, Hydrology and Water Quality Technical Report*. Since, the types of pollutants in dry weather flows are governed by the source of the flow and, therefore, are extremely variable and cannot be quantified, the analysis of dry weather flows is limited to the identification of factors that are likely to increase or decrease their occurrence. Sources of pollution potentially resulting in dry weather flows were evaluated by projecting the airport activities to occur under of the No Action/No Project Alternative and the three build alternatives and comparing those sources with those under the environmental baseline conditions.

4.7.3 Affected Environment/Environmental Baseline

The affected environment for this evaluation includes the HWQSA and the off-site fuel farms. The environmental baselines for drainage, water quality, and surface recharge pertaining to the area within

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[266] U.S. Environmental Protection Agency, Water Planning Division, Final Report on the National Urban Runoff Program, December 1983.

[267] An EMC represents the average concentration of a particular pollutant for a storm event. It does not consider fluctuations of loads within a storm event.

[268] Woodward-Clyde Consultants, Federal Highway Administration, Methodology for Analysis of Pollutant Loadings from Highway Storm Water Runoff, SHWA/RD-87/086, June 1987.

[269] Brenda Ostrom, Predicting Pollutant Loads In Airport Storm Water Runoff- Advanced Spatial Statistics, May 12, 1994.

[270] URSGreiner Woodward Clyde, Memorandum from Eric Strecker P.E. and Jim Howell, Playa Vista Storm Water EMC's, March 12, 1999.

[271] Santa Monica Bay Restoration Project, Characterization Study of the Santa Monica Bay Restoration Plan – State of the Bay 1993, January 1994.

[272] The impervious fraction is the proportion of the surface that is not pervious to water.

the HWQSA and the off-site fuel farm sites are described separately below. Impacts resulting from the construction of ground access improvements, including land within the right-of-way of the LAX Expressway and improvements to State Route 1, are addressed in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements.*

Hydrology

The hydrology issues considered for this analysis include drainage and recharge. Drainage is discussed as it relates specifically to the management of the systems designed to convey storm water runoff to prevent flooding. The environmental setting with respect to drainage and the potential for flooding focus on the regulatory issues that apply in designing drainage and flood control structures and the existing drainage system at LAX. Recharge is discussed as it relates specifically to surface waters that infiltrate pervious surfaces and have the potential to recharge groundwater.

Drainage

Drainage and flood control structures and improvements in the County of Los Angeles are subject to review and approval by the Los Angeles County Department of Public Works (LACDPW), while structures and improvements in the City of Los Angeles are subject to review and approval by the City of Los Angeles Department of Public Works (LADPW), Bureau of Engineering. Both agencies utilize design standards to provide a specified level of protection against flooding for different types of land use.

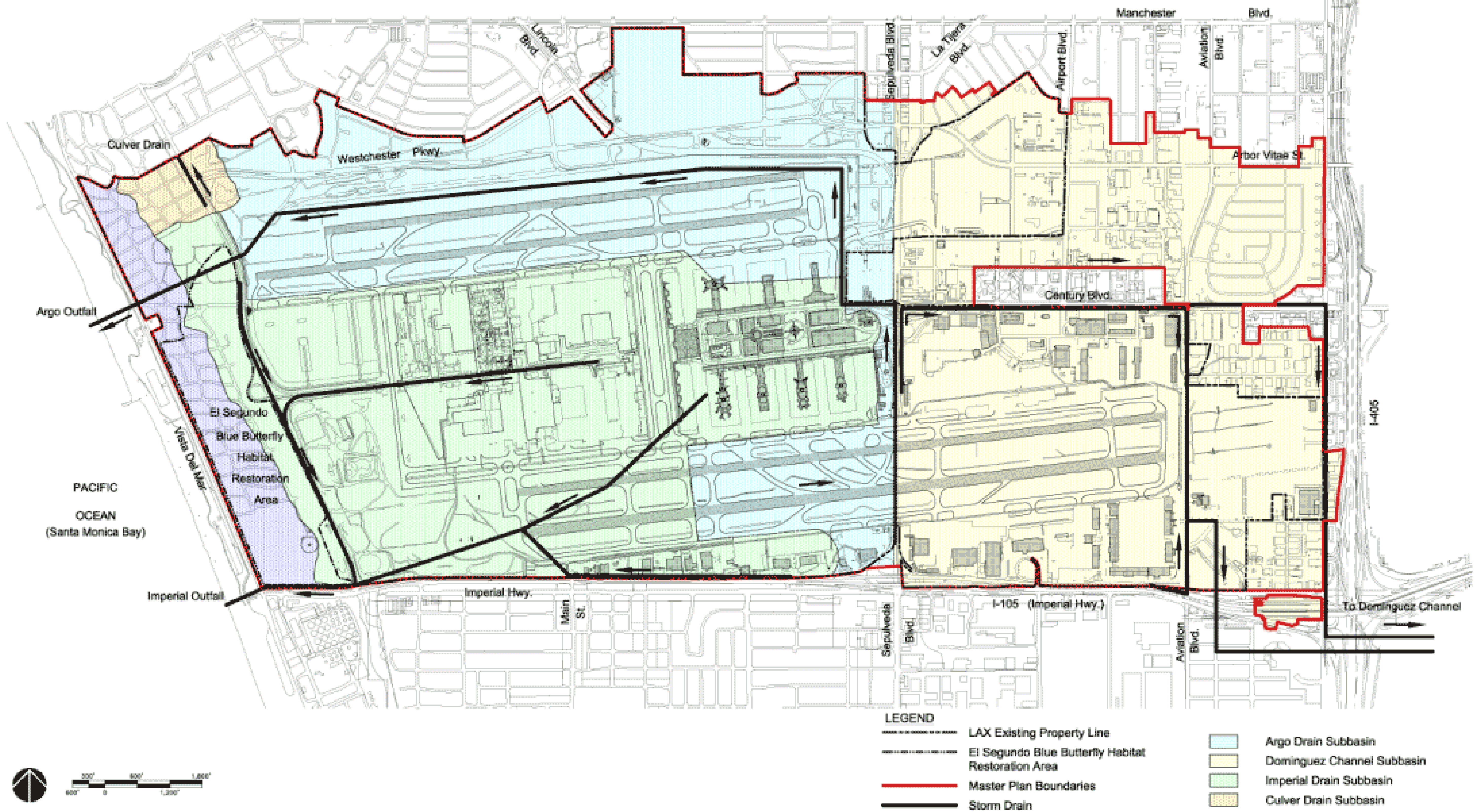
Storm water discharges are regulated by both agencies through plan approvals and permits. The county and the city both require project proponents to design storm water collection systems using specifications and procedures set forth in their respective storm drain design manuals. The project plans and specifications are submitted to the appropriate jurisdictional agency for review and approval. The agency review includes an evaluation of the effects of the project's discharge volume on the agency's jurisdictional drainage system. In cases where a proposed project would exceed the drainage system's capacity, methods for reducing impacts to the storm drain system are required, and can include controlling peak and total discharge through storm water detention or increasing site perviousness.

At LAX, surface water is discharged to both County of Los Angeles and City of Los Angeles drainage and flood control structures. County of Los Angeles facilities include the Dominguez Channel, which discharges to San Pedro Bay, as well as some of the individual drains that discharge into Santa Monica Bay. The city regulates the remaining drainage and flood control structures at the airport. The City of Los Angeles design standards for these facilities are based upon their Peak Rate Method,[273] which bases design on a pattern storm with a 50-year storm return frequency.

The existing drainage system at LAX consists of catch basins, subsurface storm drains and open channels, and outfalls.[274] The principal storm water outfalls for surface water captured on the airport property are the Dominguez Channel, the Argo Drain, the Imperial Drain, and the Culver Drain. The service boundaries for each of these outfalls form distinct sub-basins that collect surface water runoff. These sub-basins extend off airport property and collect surface water runoff from surrounding communities. In addition, the Vista Del Mar sub-basin provides drainage for the portion of the airport west of Pershing Drive (i.e., the Dunes). The location of these sub-basins within the HWQSA is illustrated in **Figure 4.7-1**, Regional Drainage Infrastructure, Baseline Conditions.

[273] City of Los Angeles Department of Public Works, Bureau of Engineering Manual - Part G, Storm Drain Design, 1973.

[274] An outfall is the point at which drainage conveyance facilities discharge.



Source: Camp Dresser & McKee Inc., 2000.

Los Angeles International Airport Master Plan

Regional Drainage Infrastructure Baseline Conditions

Figure **4.7-1**

Surface water flow from the Argo, Imperial, Culver, and Vista Del Mar sub-basins contributes to the total surface water flow in the Santa Monica Bay Watershed. The Imperial drainage basin is unique among the airport basins in that it contains both a storm water detention basin for reducing peak flow to the outfall and a water quality retention basin for collecting dry weather and "first flush" storm flows from the airport. Both basins are located north of Imperial Highway at the Pershing Drive intersection, with the detention basin located on the west side of Pershing Drive and the water quality retention basin on the east side. The storm water detention basin located west of Pershing Drive is utilized to reduce the peak discharge to the Imperial Drain outfall. The water quality retention basin located east of Pershing Drive provides collection and treatment of all dry weather runoff and the initial portion ("first flush") of wet weather runoff from the airport. However, due to the small size of the retention basin compared to the size of the drainage area, the basin does not substantially reduce storm water volumes or peak flows discharging to the Imperial Drain outfall. Flow from the Dominguez Channel sub-basin contributes to the surface water flow in the larger Dominguez Channel Watershed. Detailed descriptions of the sub-basin boundaries, outfall locations, and major conveyance facilities for each outfall are described in Technical Report 6*, Hydrology and Water Quality Technical Report*. As described in the Technical Report, all facilities (channels, storm drain pipes, box culverts, etc.) conveying storm water flows from the airport are concrete lined with the exception of the on-site Argo Ditch, which is partially an earthen channel and partially lined. Additional descriptions of the Santa Monica Bay and San Pedro Bay receiving waters are provided below in *Water Quality*.

The storm drain system at LAX is generally able to convey surface runoff volumes from low intensity rainfall events. However, some short-term flooding does occur at LAX during periods of intense rainfall. According to LAWA personnel, during a large rainfall event in 1995, the following areas experienced short-term flooding:[275]

- Service Road F near Hangars 8 and 9 and near Hangar 1 (Dominguez Channel sub-basin)
- Service Road 3 around the eastern end of Taxiways J and F (Dominguez Channel drainage area)
- Sepulveda Boulevard (i.e., the Sepulveda Tunnel) near the central part of LAX (Dominguez Channel sub-basin)
- Lincoln Boulevard south of the Westchester golf course (Argo sub-basin)
- Northwest corner of LAX, southeast of the intersection of Westchester Parkway and Pershing Drive (Argo sub-basin)
- Southeast of the intersection of World Way West and Pershing Drive (Imperial sub-basin)

Preliminary analyses of the storm drain system, conducted as part of this evaluation, indicate that, based on the LADPW Peak Rate Method, most of the major storm water outfalls at LAX do not have sufficient capacity to convey the peak runoff rates for LADPW 50-year design storm. Using this method, some outfalls are only able to convey the runoff generated by a 1-year to 5-year design storm. Given these preliminary analyses and the evidence for short-term flooding at the airport, it is assumed that the major drainage facilities serving LAX do not adequately convey storm water runoff to prevent flooding.

The amount of impervious area under baseline conditions was calculated as described in Section 4.7.2, *General Approach and Methodology*. Using this methodology, 3,510 acres of the 4,224 acres within the HWQSA (83 percent) are impervious under baseline conditions. Within the Santa Monica Bay Watershed, 2,050 acres (75 percent) are impervious and within the Dominguez Channel Watershed, 1,460 acres (97 percent) are impervious.

Two sites close to LAX are being considered for the construction of an off-site fuel farm under Alternative B: Scattergood Electric Generating Station and the oil refinery located south of the airport. Both proposed fuel farm sites are located within the Santa Monica Bay Watershed. Surface water generated at the Scattergood Fuel Farm site consists exclusively of storm water, which is contained within earthen berms approximately six feet high. Surface water that collects within the berms percolates into the ground and does not drain offsite. Surface water generated in the area of the proposed oil refinery fuel farm site consists of storm water and some industrial process water, including non-contact cooling tower blowdown, boiler blowdown, a portion of the refinery's total recovery well ground water, and other wastes containing no free oil. This water is collected by the refinery's wastewater treatment system and

[275] Los Angeles World Airports, Construction and Maintenance Division.

receives primary treatment at the refinery's oil/water separator, consisting of gravity separation and induced air flotation units for oil/water separation. All storm water is detained onsite for treatment.

Recharge

Whether or not surface water infiltrates the pervious surface to recharge or continues to runoff depends on a number of conditions, including soil type, antecedent soil moisture conditions, and the amount of vegetative cover. Once in the soil, the infiltrating water is either taken up by evapotranspiration[276] or it continues to percolate through the soil and to recharge groundwater. Changes to the amount of pervious surfaces on a property can affect the quantity of surface water recharge. Substantial reductions in the amount of surface recharge could lower the water table, reduce the volume of groundwater in storage, and potentially expose the upper aquifer to seawater intrusion.

Groundwater occurs in several aquifers beneath the HWQSA, within what is known as the West Coast Groundwater Basin. Additional descriptions of the groundwater, aquifers (water bearing units), and aquitards (water bearing rock of low permeability) within the basin are provided in Technical Report 6, *Hydrology and Water Quality Technical Report*. Designated beneficial uses for groundwater include Municipal, Industrial, Process, and Agricultural.[277] However, groundwater beneath LAX is not used for municipal or agricultural purposes (see Section 4.23, *Hazardous Materials*) and industrial and process uses are limited to the extraction and treatment of contaminated groundwater.

To characterize the components that contribute to the groundwater supplies in the Basin, a water budget was developed as part of a water management study of the West Coast Basin Barrier Project by the West Basin Municipal Water District.[278] Based on this water budget, 6,700 acre-feet/year of groundwater inflows to the Basin are attributed to surface recharge.[279] This is approximately 13 percent of the total estimated inflows. Sources for this recharge include precipitation, surface water streams, irrigation water from field and lawns, industrial and commercial wastes, and other applied surface waters.[280] Within the HWQSA there are no surface water streams and industrial and commercial waste discharges are prohibited on the airport. Sources for recharge at the airport include precipitation and its associated runoff, and applied irrigation.

The average annual recharge rate within the Basin, and the current volume of recharge within the HWQSA were calculated using the methodologies described in Section 4.7.2, *General Approach and Methodology*. The annual average recharge rate was based on estimates of surface recharge volume (6,700 acre-feet/year) and the total pervious area within the West Coast Groundwater Basin (28,271 acres). Using these figures, the estimated recharge rate through the pervious surfaces of the West Coast Groundwater Basin was approximately 0.24 feet/year (2.88 inches/year). Based on this average annual recharge rate, the pervious surfaces under baseline conditions are estimated to provide 171 acre-feet/year of surface recharge. This volume is less than 0.1 percent of the total inflows estimated for the West Coast Groundwater Basin.

As mentioned previously, surface water generated at the Scattergood site consists exclusively of storm water that is contained within earthen berms. All surface water that collects within the berms is available for recharge through the pervious surfaces at the site. The oil refinery site consists almost exclusively of impervious surfaces. Therefore, for all practical purposes, surface recharge does not occur at the oil refinery site.

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[276] Evapotranspiration is defined as the combination of evaporation and transpiration processes. Transpiration is the process by which water in the soil is taken by the roots of plants and evaporated through the leaves the plants.

[277] California Regional Water Quality Control Board, Los Angeles Region 4, Water Quality Control Plan, Los Angeles Region - Basin Plan for the Coastal Water sheds of Los Angeles and Ventura Counties, June 13, 1994.

[278] The West Coast Basin Barrier Project consists of a series of 153 injection wells that generally parallel the Pacific Ocean and extend from just south of LAX to the Palos Verdes Hills. Fresh water is injected into these wells creating a hydrologic barrier that mitigates seawater intrusion in coastal groundwater aquifers of the West Coast Basin.

[279] CH2M Hill, West Basin Municipal Water District, Engineering Report, West Coast Basin Barrier Project – West Basin Water Recycling Program, 1993.

[280] CH2M Hill, West Basin Municipal Water District, Engineering Report, West Coast Basin Barrier Project – West Basin Water Recycling Program, 1993.

Water Quality

Water quality is discussed as it relates to the transport of water quality constituents in surface waters generated by storm water and urban activities and their effects on receiving bodies. For the purposes of this analysis, a constituent may be a pollutant or other measurable component of water quality.

Regulatory Provisions Concerning Water Quality

There are a number of federal, state, and local regulatory programs pertaining to the maintenance and enhancement of water quality. Many of the programs are overlapping. For example, the state is responsible for overseeing many of the permit programs mandated by the federal Clean Water Act (CWA). The County and City of Los Angeles, in turn, are responsible for implementing the permits issued to them under the state program. Included below is a summary of major regulatory provisions concerning water quality. The purpose of these programs is generally to protect and enhance water quality.

Water Quality Assurance Letter

In accordance with the Airport and Airway Improvement Act of 1982 as amended, and codified in USC Title 49, Section 47106(c), the Secretary of the U.S. Department of Transportation may approve a grant application for an airport development project involving a major extension of a runway only if a letter is obtained from the State certifying, with reasonable assurance, that the airport development project would be located, designed, constructed, and operated in compliance with applicable water quality standards.

Water Quality Control Plan

The agency with jurisdiction over water quality at LAX is the Los Angeles Regional Water Quality Control Board (LARWQCB). The LARWQCB developed the *Water Quality Control Plan (Basin Plan) for the Los Angeles Region,*[281] which guides conservation and enhancement of water resources and establishes beneficial uses for inland surface waters, tidal prisms, harbors, and groundwater basins within the region. Beneficial uses are designated so that water quality objectives can be established and programs that enhance or maintain water quality can be implemented. The Basin Plan also incorporates State Water Resources Control Board (SWRCB) statewide Water Quality Control Plans. The only applicable statewide plan, at this time, is the California Ocean Plan. Like the Basin Plan, the California Ocean Plan was created to establish beneficial uses and associated water quality objectives for California's ocean waters and to provide a basis for regulation of wastes discharged to coastal waters by point and non-point source discharges.

National Pollutant Discharge Elimination System (NPDES) Program

The CWA prohibits the discharge of pollutants to waters of the United States from any point source unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. In accordance with the CWA, the USEPA promulgated regulations for permitting storm water discharges by municipal and industrial facilities and construction activities through the NPDES program. The municipal storm water NPDES program generally applies to urban areas with a population greater than 100,000 while the industrial program applies to specific types of industry, including airports. The NPDES program for construction applies to activities that disturb an area of five acres or more. In March of 2002, this permit will be expanded to include activities that disturb an area of one acre or more. The NPDES permits for municipal, industrial, and construction activities are described below.

NPDES - Municipal Permit

In accordance with the CWA, an NPDES permit is required for certain municipal separate storm sewer discharges to surface waters. The airport is within the region covered by NPDES Permit No. CAS614001 issued by the LARWQCB on July 15, 1996. The permit is a joint permit, with the County of Los Angeles as the "Principal Permittee" and 85 incorporated cities within the County of Los Angeles, including the City of Los Angeles, as "Permittees." The objective of the permit, and the associated storm water management program, is to effectively prohibit non-storm water discharges and to reduce pollutants in urban storm water discharges to the "maximum extent practicable" in order to attain water quality objectives and to protect the beneficial uses of receiving waters in the County of Los Angeles.

[281] California Regional Water Quality Control Board, Los Angeles Region 4, Water Quality Control Plan, Los Angeles Region - Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994.

As part of the municipal storm water program, the LARWQCB adopted the Standard Urban Storm Water Mitigation Plan (SUSMP) to address storm water pollution from new development and redevelopment projects. The SUSMP is a model guidance document for use by Permitees to select post-construction Best Management Practices (BMPs) so that the primary objectives of the municipal storm water program are met. The SUSMP program applies to specified project types. Generally, three types of BMPs are described in the SUSMP, including source control, structural, and treatment control.[282] The SUSMP also specifies structural and treatment control BMP design standards for infiltration and/or treatment of storm water runoff.

NPDES - Industrial Permit

The SWRCB issued a statewide Industrial Activities Storm Water General Permit (Industrial Permit) that applies to all industrial facilities that discharge storm water and require a NPDES permit. The major provisions of the Industrial Permit require that the Permittees eliminate or reduce non-storm water discharges, develop and implement a Storm Water Pollution Prevention Plan (SWPPP), and perform monitoring of discharges to the storm water system from their facilities. Since an airport is considered a transportation facility, LAWA and tenants on the airport property that engage in industrial activities are required to be permitted under the industrial NPDES program.

LAWA has prepared a SWPPP to address the permitting of storm water discharges associated with industrial activities at LAX. Numerous tenants, who conduct a variety of airport-related support functions, occupy leaseholds at LAX and also perform these activities and are therefore included as co-Permittees under LAWA's SWPPP program. The LAX SWPPP contains general information, such as drainage system layout and tenant and site activities; describes past and present potential sources of pollutants in storm water; designates programs to identify and eliminate non-storm water discharges; and describes the storm water management controls being implemented at LAX and the ongoing storm water monitoring program. Additional information on the LAX SWPPP is provided in Technical Report 6*, Hydrology and Water Quality Technical Report.*

NPDES - Construction Permit

In addition to the municipal and industrial permits, the SWRCB issued a statewide NPDES general permit for storm water discharges associated with construction activities (Construction Permit), in accordance with federal storm water regulations. Project proponents planning construction activities that disturb an area greater than five acres are required to file a Notice of Intent (NOI) to discharge under the Construction Permit. After a NOI has been submitted, the discharger is authorized by the SWRCB to discharge storm water under the terms and conditions of the general permit. The major provisions of the Construction Permit are generally the same as those for the industrial permit although they focus on impacts associated with construction activities. As indicated previously, in March 2002, these permit requirements will extend to construction activities that disturb an area equal to or greater than one acre.

As required under the SWRCB General Permit for Construction Activities, LAWA has prepared a Storm Water Guidance Manual for Construction Activities. This document outlines the procedures for preparing and implementing a construction SWPPP before beginning construction operations so that the activities are in compliance with the general permit.

Total Maximum Daily Load Program

Under Section 303(d) of the CWA, states are required to identify the water bodies that do not meet water quality objectives through control of point source discharges under NPDES permits. For these water bodies, states are required to develop appropriate total maximum daily loads (TMDLs). TMDLs are the sum of the individual pollutant load allocations for point sources, nonpoint sources,[283] and natural

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[20] As defined in the SUSMP:

"Source control BMP means any schedules of activities, prohibition of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution."

"Structural BMP means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g., canopy, structural enclosure). The category may include both source control and treatment BMPs."

"Treatment control BMP means any engineered system designed to remove pollutants by simple gravity setting of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process."

[283] Discharges originating from single sources, like power and wastewater treatment plants, are referred to as point source

background conditions, with an appropriate margin of safety for a designated water body. The TMDLs are established based on a quantitative assessment of water quality problems, the contributing sources, and load reductions or control actions needed to restore and protect an individual water body.[284] As opposed to the NPDES programs, which focuses on reducing or eliminating non-storm water discharges and reducing the discharge of pollutants to the maximum extent practicable, TMDLs provide an analytical basis for planning and implementing pollution controls, land management practices, and restoration projects needed to protect water quality.

California has identified the Santa Monica Bay and the Dominguez Channels as water bodies requiring TMDLs. To date, TMDLs for these two water bodies have not been developed, however, the listing does indicate that both non-point and point sources of pollution degrade the water quality of the Santa Monica Bay and the Dominguez Channel.[285] Pollutants identified as requiring TMDLs for these water bodies are listed in **Table 4.7-1**, Pollutants/Stressors Scheduled for TMDL Development.

Table 4.7-1

Pollutants/Stressors Scheduled for TMDL Development

Santa Monica Bay Offshore and Near Shore	Dominguez Channel Estuary (To Vermont)
Cadmium	Aldrin
Chlordane	Ammonia
Copper	Chem A
Dichlorodiphenyltrichloroethane (DDT)	Chlordane
Debris	Chromium
Fish Consumption Advisory	Copper
Lead	DDT
Mercury	Dieldrin
Nickel	High Coliform Count
Polyaromatic Hydrocarbons (PAHs)	PAHs
Polychlorinated Biphenyls (PCBs)	PCBs
Sediment Toxicity	Zinc
Silver	
Zinc	

Source: USEPA, California 303(d) List, May 12, 1999.

Receiving Bodies of Water

As mentioned previously, there are no natural streams or rivers within the HWQSA. Surface water flows that are generated within the study area are comprised of either wet weather flows in response to precipitation or dry weather flows from land use-related activities. Both wet and dry weather flows drain to either Santa Monica Bay or Dominguez Channel. The Santa Monica Bay and the Dominguez Channel are referred to as "receiving water bodies." Within the HWQSA, the boundary for these two watersheds is located generally along Sepulveda Boulevard with areas west of Sepulveda Boulevard draining to Santa Monica Bay and areas east draining to the Dominguez Channel.

Santa Monica Bay

Santa Monica Bay is an open embayment of the Pacific Ocean with a designated surface area of approximately 266 square miles and is the receiving water body for surface water drainage from approximately 414 square miles of land. Uses of Santa Monica Bay include recreational, commercial, and industrial uses. Regionally, urban, industrial, and open space land uses comprise most of the Santa Monica Bay Watershed and surface water runoff from these areas has drastically altered the natural

discharges, while storm water and/or urban runoff are non-point sources of water pollution since their origins cannot be attributed to a single identifiable source.

[284] U.S. Environmental Protection Agency, Total Maximum Daily Load Fact Sheet, Available: http://www.epa.gov/region09/water/tmdl/fact.html [4/24/00].

[285] U.S. Environmental Protection Agency, Total Maximum Daily Load Program, Available: http://www.epa.gov/region09/water/tmdl/index.html#303d [11/1/00].

environment of the Bay. For the purpose of better understanding the impacts of pollutants and evaluating measures to protect the environment of Santa Monica Bay, a consortium of interested parties, including government agencies and private entities, initiated and formed the Santa Monica Bay Restoration Project (SMBRP). The SMBRP produced a report with the objective of updating previous information characterizing Santa Monica Bay. This report, titled *Characterization Study of the Santa Monica Bay Restoration – State of the Bay 1993*, presented a comprehensive assessment of pollution levels in the Bay and evaluated the effects of the pollution. Of the pollutants measured and found to have affected the bay's environment, 19 pollutants were identified in the SMBRP's *State of the Bay Report for 1993* as pollutants of concern.[286] These pollutants include toxic organic compounds, heavy metals, pathogens, nutrients, sediments, trash and debris, oil and grease, and others.

Sources for the pollutants of concern in the Santa Monica Bay include both point sources and non-point sources. According to the SMBRP's most recent report, *Taking the Pulse of the Bay – State of the Bay 1998*, runoff from urban areas is the most important uncontrolled source of pollution discharging into the Bay.[287]

According to the SWRCB *1994 Water Body Fact Sheet* and the LARWQCB, the waters of Santa Monica Bay have been assigned an impaired rating.[288] This rating is based on findings that the waters preclude, compromise, or do not support their designated beneficial uses, which are contained in the Water Quality Control Plan. Some of these beneficial uses include industrial, navigation, recreation, and fishing. In addition, other designated beneficial uses for the Santa Monica Bay require that the waters support biological and rare or endangered habitats, the migration of aquatic organisms, the support of spawning, and early development of fish and shellfish harvesting. The Santa Monica Bay's biological community has been identified as being imbalanced, severely stressed, or known to contain toxicities in concentrations that are hazardous to human health.[289]

Dominguez Channel

The Dominguez Channel delivers surface water from approximately 72 square miles of urban area within Los Angeles. The channel extends from central Los Angeles, approximately two miles east of LAX, to San Pedro Harbor. The Dominguez Channel Watershed is located entirely within the County of Los Angeles and is bordered to the north and west by the Santa Monica Bay Watershed, to the east by the Los Angeles River Watershed, and to the south by the Los Angeles/Long Beach Harbor. The Dominguez Channel is a concrete-lined channel that drains surface waters from the watershed into the Los Angeles Harbor and is the only major surface water feature within the watershed. The Dominguez Channel has been designated by the LARWQCB as an Inland Surface Water Body and, as such, beneficial uses for the channel have been designated. Some beneficial uses for this water body include municipal and domestic supply, contact and non-contact recreation. Other beneficial uses for the Dominguez Channel require that the water support freshwater and wildlife habitat, as well as support rare threatened or endangered species. Additional discussion of these beneficial uses is presented in Technical Report 6*, Hydrology and Water Quality Technical Report.*

Regionally, urban and industrial land uses comprise most of the Dominguez Channel Watershed. The subarea of this watershed within which LAX is located has been designated as impaired due to point source discharges from industrial and municipal activities, accidental spills, and urban runoff. Waters in this subarea have been characterized as having elevated metal and pesticide concentrations in sediments along with high coliform counts.

Storm Water Pollutant Loads

Pollutant loads delivered from the study area to receiving water bodies under baseline conditions, as estimated using the methods described in Section 4.7.2, *General Approach and Methodology*, are presented in **Table 4.7-2,** Average Annual Pollutant Loads (lb/yr), Baseline Conditions. Detailed pollutant

[286] Santa Monica Bay Restoration Project, Characterization Study of the Santa Monica Bay Restoration Plan – State of the Bay 1993, January 1994.

[287] Santa Monica Bay Restoration Project, Taking the Pulse of the Bay – State of the Bay 1998, April 1998.

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

[289] Santa Monica Bay Restoration Project, Characterization Study of the Santa Monica Bay Restoration Plan – State of the Bay 1993, January 1994.

load calculations for baseline conditions are presented in Technical Report 6*, Hydrology and Water Quality Technical Report.*

Table 4.7-2

Average Annual Pollutant Loads (lb/yr), Baseline Conditions

Pollutant Load	Santa Monica Bay	Dominguez Channel	Total Pollutant Load
Total Suspended Solids (TSS)	142,457	200,008	342,465
Total Phosphorus (P)	1,171	964	2,135
Total Kjeldal Nitrogen (TKN)	5,403	5,517	10,920
Total Copper (Cu)	198	136	334
Total Lead (Pb)	62	52	114
Total Zinc (Zn)	1,231	1,010	2,241
Oil and Grease	9,873	7,059	16,932
Biochemical Oxygen Demand (BOD)	40,209	41,564	81,773
Chemical Oxygen Demand (COD)	201,844	185,341	387,186

Source: Camp Dresser & McKee Inc., 2000.

Storm water is not discharged from the Scattergood site and all storm water generated at the oil refinery site is treated and discharged in accordance with an NPDES permit. Therefore, there is no storm water pollutant load presently associated with the off-site fuel farm sites.

Dry Weather Flows

Sources of dry weather flows for airports include outdoor maintenance of vehicles, buildings, and grounds; aircraft and ground vehicle fueling; painting, stripping, washing, and deicing; and chemical and fuel transport and storage. Detailed descriptions of these sources and their associated pollutants are provided in Technical Report 6*, Hydrology and Water Quality Technical Report.* Sources of dry weather flows at the off-site fuel farms include chemical and fuel transport and storage.

4.7.4 Thresholds of Significance

4.7.4.1 CEQA Thresholds of Significance

Hydrology

A significant hydrology impact would occur if the direct and indirect changes in the environment that may be caused by a particular build alternative would potentially result in one or more of the following future conditions:

- An increase in runoff that would cause or exacerbate flooding with the potential to harm people or damage property.
- Substantial interference with groundwater recharge such that there would be a net decrease in the aquifer volume or a change groundwater storage that would adversely affect the quantity, water level, or flow of the underlying groundwater relative to beneficial uses of the basin.
- Substantial alteration of the existing drainage pattern of the site in a manner which would result in substantial erosion or siltation on- or off-site.

These thresholds of significance are utilized because they address potential concerns relative to flooding and recharge associated with the Master Plan alternatives. The thresholds reflect those contained in the *Draft L.A. CEQA Thresholds Guide*[290] that are relevant to this project, as well as relevant issues identified in the suggested Initial Study Checklist contained in the *State CEQA Guidelines*.

[290] City of Los Angeles, Draft L.A. CEQA Thresholds Guide, May 14, 1998.

Water Quality

A significant water quality impact would occur if the direct and indirect changes in the environment that may be caused by a particular project alternative would potentially result in the following future condition:

- An increased load of a pollutant of concern delivered to a receiving water body by surface water runoff.

This threshold of significance was developed because it addresses the potential water quality impacts resulting from project-related runoff being discharged to receiving water bodies that are already considered impaired. The threshold is based on guidance provided by the *Draft L.A. CEQA Thresholds Guide* as well as relevant issues identified in the suggested Initial Study Checklist contained in the *State CEQA Guidelines*.

4.7.4.2 Federal Standards

There are no federal standards that define significance thresholds for hydrology and water quality impacts. However, as described in Section 4.7.3, *Affected Environment/Environmental Baseline*, there are a number of federal regulatory programs pertaining to the maintenance and enhancement of water quality pursuant to the Clean Water Act. The most notable programs include the NPDES program and the TMDL program. These programs are implemented by state and local agencies, and are addressed in this analysis.

4.7.5 Master Plan Commitments

As addressed in Section 4.7.6, *Environmental Consequences*, implementation of any of the Master Plan alternatives would have potential impacts related to hydrology and water quality. In recognition of these potential impacts, LAWA has included the commitment listed below in the Master Plan, coded "HWQ" for "hydrology and water quality."

- **HWQ-1. Develop Detailed Drainage Plan.**

  Once a Master Plan alternative is selected, and in conjunction with its preliminary design, LAWA will develop a detailed drainage plan of the area within the boundaries of the alternative. The purpose of the drainage plan will be to assess site-specific drainage flows at a design level of detail in order to select the most appropriate Mitigation Measures, from those identified in this EIS/EIR.

  LAWA will develop this drainage plan and evaluate drainage capacity using the Peak Rate Method specified in Part G - Storm Drain Design of the City of Los Angeles' *Bureau of Engineering Manual*. In areas within the boundary of the selected alternative where the surface water runoff rates are found to exceed the capacity of the storm water conveyance infrastructure with the potential to cause flooding, LAWA will take measures to either reduce peak flow rates or increase the structure's capacity. These drainage facilities will be designed to ensure that they adequately convey storm water runoff and prevent flooding by adhering to the procedures set forth by the Peak Rate Method. Methods to reduce the peak flow of surface water runoff could include:

  - Decreasing impervious area by removing unnecessary pavement or utilizing porous concrete or modular pavement
  - Building storm water detention structures
  - Diverting runoff to pervious areas (reducing directly-connected pervious areas)
  - Diverting runoff to outfalls with additional capacity (reducing the total drainage area for an individual outfall)
  - Redirecting storm water flows to increase the time of concentration

  Measures to increase drainage capacity could include:

  - Increasing the size and slope (capacity) of storm water conveyance structures (pipes, culverts, channels, etc.)
  - Increasing the number of storm water conveyance structures and or/outfalls

  LAWA will also evaluate the effect of the selected Master Plan alternative on surface water quality using the LARWQCB's SUSMP. The SUSMP addresses water quality and drainage issues by specifying source control, structural, and treatment control BMPs with the objective of reducing the discharge of pollutants from the storm water conveyance system to the maximum extent practicable.

LAWA will comply with these provisions by designing the storm water system to meet the requirements of the SUSMP through incorporation of both structural and treatment control BMPs. These BMPs would be applied to both existing and future sources with the goal of achieving no net increase in loadings of pollutants of concern. The following list includes some of the BMPs that could be employed to infiltrate or treat storm water runoff and control peak flow rates:

- Vegetated swales and strips
- Oil/Water Separators
- Clarifiers
- Media Filtration
- Catch Basins Inserts and Screens
- Continuous Flow Deflective Systems
- Bioretention and Infiltration
- Detention Basins
- Manufactured treatment units

The performance of structural BMPs varies considerably based on their design.[291] USEPA has published estimated ranges of pollutant removal efficiencies for structural BMPs based on substantial document review. These ranges of removal efficiencies are presented in **Table 4.7-3,** Structural BMP Expected Pollutant Removal Efficiency.

Table 4.7-3

Structural BMP Expected Pollutant Removal Efficiency

BMP Type	Typical Pollutant Removal (percent)			
	Suspended Solids	Nitrogen	Phosphorus	Metals
Dry Detention Basins	30-35	15-45	15-45	15-45
Retention Basins	50-80	30-65	30-65	50-80
Infiltration Basins	50-80	50-80	50-80	50-80
Infiltration Trenches/Dry Wells	50-80	50-80	15-45	50-80
Porous Pavement	65-100	65-100	30-65	65-100
Grassed Swales	30-65	15-45	15-45	15-45
Vegetated Filter Strips	50-80	50-80	50-80	30-65
Surface Sand Filters	50-80	<30	50-80	50-80
Other Media Filters	65-100	15-45	0	50-80

Source: U.S. Environmental Protection Agency, "Preliminary Data Summary of Urban Storm Water Best Management Practices Methodology," August 1999.

The overall result of Master Plan Commitment HWQ-1 will be a drainage infrastructure that provides adequate drainage capacity to prevent flooding and control peak flow discharges and that incorporates BMPs to minimize the effect of airport operations on surface water quality and to prevent a net increase to pollutant loads in surface water resulting from the selected Master Plan alternative.

4.7.6 Environmental Consequences

This section describes the environmental impacts of the No Action/No Project Alternative and each of the three build alternatives as they relate to hydrology (drainage and recharge) and water quality.

The drainage analysis addresses changes in impervious area and how these changes would be expected to affect the potential for flooding to occur. Potential environmental impacts related to changes in impervious area affecting the quantity of recharge, are also addressed. As described in Section 4.7.2, *General Approach and Methodology,* the drainage analysis is based on calculations of total impervious

[291] U.S. Environmental Protection Agency, Preliminary Data Summary of Urban Storm Water Best Management Practices Methodology, August 1999.

area. Land use designations and impervious area calculations and results for the No Action/No Project Alternative and the three build alternatives are presented in **Table 4.7-4**, Total Impervious Area within the HWQSA. Impervious area values for each alternative and planning horizon are presented in Technical Report 6*, Hydrology and Water Quality Technical Report.*

Table 4.7-4

Total Impervious Area within the HWQSA (acres)

		Alternative							
	Baseline	NA/NP		A		B		C	
Area	Conditions	2005	2015	2005	2015	2005	2015	2005	2015
Santa Monica Bay	2,050	2,184	2,184	2,136	2,259	2,152	2,194	2,148	2,224
Dominguez Channel	1,460	1,398	1,398	1,291	1,371	1,370	1,387	1,366	1,363
HWQSA	3,510	3,582	3,582	3,427	3,630	3,522	3,581	3,514	3,587

Source: Camp Dresser & McKee Inc., 2000.

The recharge analysis discusses the changes in estimated surface water recharge volumes and how this change would be expected to affect the beneficial uses of groundwater in the West Coast Basin. Recharge volumes were calculated as described in Section 4.7.2, *General Approach and Methodology*. The results of these calculations for each alternative and planning horizon are presented in **Table 4.7-5**, Annual Surface Water Recharge Volumes within the HWQSA.

Table 4.7-5

Annual Surface Water Recharge Volumes within the HWQSA

		Alternative							
	Baseline	NA/NP		A		B		C	
	Conditions	2005	2015	2005	2015	2005	2015	2005	2015
Pervious Area (acres)	714	643	643	795	593	699	641	707	635
Recharge Volume (acre-feet/year)	171	154	154	191	142	168	154	170	152

Source: Camp Dresser & McKee Inc., 2000.

The water quality analysis estimates the storm water pollutant load that would be discharged to receiving water bodies, describes potential sources for dry weather flows as compared to baseline conditions, and evaluates the effects of construction associated with the No Action/No Project Alternative and the three build alternatives. Land uses designations, average annual runoff volumes, and pollutant load calculations and results for the No Action/No Project Alternative and the three build alternatives are presented in Technical Report 6*, Hydrology and Water Quality Technical Report*. Impacts associated with dry weather flows and construction activities are discussed and their effects on water quality are evaluated qualitatively.

Environmental effects would be similar for any given alternative for both 2005 and 2015. Therefore, impacts associated with the two planning horizons are discussed together.

4.7.6.1 No Action/No Project Alternative

Hydrology

Drainage

Under the No Action/No Project Alternative, there would be limited improvements to the airfield and related uses (e.g., cargo). In addition, as part of an ongoing action by LAWA, land uses within the ANMP properties would be demolished and remain vacant; it is assumed for this analysis that these properties would become open space. LAX Northside and Continental City would be built out with offices, hotels,

retail stores, restaurants, a research and development business park, and airport-related uses. Also, the full-length of the Argo Ditch, which is an unlined channel collecting and conveying storm water from the Argo sub-basin to the box culvert of the Argo outfall, would be upgraded to a concrete-lined box culvert. These improvements would be completed by 2005.

With the changes planned under the No Action/No Project Alternative, the total amount of impervious area within the HWQSA would be 3,582 acres, an increase of 72 acres over baseline conditions. Since much of the area surrounding the airport in both the Santa Monica Bay and Dominguez Channel watershed is developed, this change is regionally marginal. However, the change in impervious area under the No Action/No Project Alternative would occur primarily within the Santa Monica Bay Watershed, where impervious area would increase by 134 acres (seven percent) as a result of converting land uses at LAX Northside from open space to mixed use development. In the Dominguez Channel Watershed, demolition of the ANMP properties would decrease the impervious area by 62 acres (four percent). The drainage systems serving LAX Northside and Continental City would be designed using the LADPW Peak Rate Method. As a result, flooding within the development areas would be controlled to acceptable levels. Nevertheless, it is anticipated that surface water runoff and peak flow rates discharged from the LAX Northside and Continental City areas would increase over baseline conditions. Surface water runoff from LAX Northside would drain to the Argo and Culver sub-basins. Runoff from Continental City would drain to the Dominguez Channel sub-basin. Within the Argo sub-basin, storm water outfalls and related facilities downstream from LAX Northside currently do not have sufficient capacity to prevent localized flooding. Under the No Action/No Project Alternative, regional drainage facilities within the Argo sub-basin would not be upgraded, and the increased peak flows would exacerbate existing flooding problems within this sub-basin.

As described in Section 4.7.3, *Affected Environment/Environmental Baseline*, all facilities receiving and conveying storm water from the airport would be concrete lined under the No Action/No Project Alternative. Therefore, increase storm water flows and potential changes in the drainage infrastructure would not result in substantial erosion or siltation, either on-site or offsite.

Surface Recharge

Under the No Action/No Project Alternative, the volume of surface recharge within the HWQSA would decrease by 17 acre-feet/year to 154 acre-feet/year as compared to baseline conditions. This change would represent less than a 0.1 percent reduction in the total groundwater inflows estimated for the West Coast Basin under baseline conditions and would not substantially change groundwater storage or groundwater elevations beneath the study area. With the exception of the extraction and treatment of contaminated groundwater (see Section 4.23, *Hazardous Materials*), no groundwater production occurs within the Master Plan boundaries relative to the beneficial uses designated for the West Coast Groundwater Basin.

Water Quality

As indicated previously, under the No Action/No Project Alternative, there would be limited improvements to the airfield and related uses at LAX. Land uses within the ANMP properties would be demolished as part of an ongoing separate action by LAWA, and LAX Northside and Continental City would be built out. These improvements would be completed by 2005.

Water Quality Assurance Letter

Under the No Action/No Project Alternative, there would be no extension of the runways at LAX and, therefore, no letter from the State would be required certifying that the runways be located, designed, constructed, and operated in compliance with applicable water quality standards.

Storm Water Pollutant Loads

As compared to baseline conditions, the estimated pollutant loads generated under the No Action/No Project Alternative would increase between three and 11 percent for all pollutants of concern. Most of this increased pollutant load would occur in the Santa Monica Bay Watershed and is attributed to the development of LAX Northside from open space to mixed use development. In the Dominguez Channel, the loads of all modeled pollutant of concern would decrease as industrial, commercial, and residential land uses within the acquisition areas are converted to airport operations and airports open space.

LAX Northside and Continental City would be required to comply with the SUSMP requirements. The storm water system would be designed to meet the requirements in the SUSMP through incorporation of

source control, structural, and treatment control BMPs. These BMPs would be designed with the goal of reducing impacts to water quality to the maximum extent practicable.

Dry Weather Flows

Under the No Action/No Project Alternative, sources for dry weather flows at LAX would be similar to baseline conditions. Most of the airport-related activities that have the potential to generate these flows would continue to be performed within the Imperial sub-basin where the Imperial detention basin would continue to detain the flows for treatment at Hyperion Treatment Plant. Dry weather flows generated outside of the Imperial sub-basin that enter the storm drain system would continue to discharge either to the Dominguez Channel or to the Santa Monica Bay untreated. The conversion of LAX Northside and Continental City from open space to mixed use development could potentially increase the occurrence of dry weather flows and degrade water quality. However, as stated in Section 4.23, *Hazardous Materials*, compliance with existing regulations and airport procedures, particularly the LAX SWPPP, would reduce the likelihood of spills of hazardous material and minimize the effects of their release. In addition, newly developed and redeveloped areas would incorporate source, structural, and treatment control BMPs.

Construction Effects

Under the No Action/No Project Alternative, construction of LAX Northside and Continental City, as well as other improvements at LAX, would create sources of pollution that could potentially affect water quality. As these construction activities would affect an area greater than five acres, LAWA's existing construction policy would require the development of a construction SWPPP in compliance with the state's construction permit. Temporary construction Best Management Practices (BMPs) specified in LAWA's existing Construction SWPPP for LAX include:

- Soil stabilization (erosion control) techniques such as seeding and planting, mulching, and check dams
- Sediment control methods such as detention basins, silt fences, and dust control
- Contractor training programs
- Material transfer practices
- Waste management practices such as providing designated storage areas and containers for specific waste for regular collection
- Roadway cleaning/tracking control practices
- Vehicle and equipment cleaning and maintenance practices
- Fueling practices

4.7.6.2 Alternative A – Added Runway North

Under Alternative A, the building area dedicated to terminal, cargo, and ancillary airport uses would increase and the building area for maintenance uses would decrease compared to baseline conditions. Alternative A would also include development of Westchester Southside (scaled-down LAX Northside). Existing uses in the acquisition areas would be demolished. (Uses within the ANMP properties -- Belford and Manchester Square -- will be demolished as part of a separate action being undertaken by LAWA.) The land within the acquisition areas and Belford would be incorporated into the Master Plan.

Hydrology

Drainage

Under Alternative A, there would be an increased area dedicated to airport operational land uses, including terminals and cargo areas. Alternative A would also include development of Westchester Southside and conversion of industrial, commercial, and residential land uses in the acquisition areas to airport uses.

Under Alternative A in 2005, the total impervious area within the HWQSA would be 3,427 acres or 81 percent of the area. This represents a decrease in total impervious area of 83 acres when compared to baseline conditions of 3,510 acres and a decrease of 155 acres when compared to No Action/No Project Alternative of 3,582 acres.

Changes in impervious area under Alternative A in 2005 would not be evenly distributed between the two watersheds when compared with baseline conditions. Within the Dominguez Channel sub-basin, impervious area would decrease by 12 percent as areas of industrial, commercial, and residential land uses within the acquisition areas are converted to airport open space land use. However, within the sub-basins draining to Santa Monica Bay, impervious area would increase 86 acres (four percent) because of the conversion of some open space land uses to roadways and airport operations and the partial development of Westchester Southside. As a result, in 2005, total surface water runoff volumes and peak flows to Santa Monica Bay may increase.

Most of the increase in impervious area in 2005 would occur within the Argo and Imperial sub-basins, both of which discharge to Santa Monica Bay. As stated in Section 4.7.3, *Affected Environment/Environmental Baseline*, preliminary analyses based on the LADPW Peak Rate Method indicate that the capacities of the storm water conveyance facilities within these two sub-basins are insufficient to prevent flooding. Therefore, the projected increase in impervious area in the Santa Monica Bay Watershed, and the associated increase in surface water runoff and peak flow discharges, could potentially cause flooding.

Under Alternative A by 2015, the total impervious area within the HWQSA would increase by 120 acres as compared to baseline conditions of 3,510 acres. The total impervious area within the study area would increase by 48 acres when compared to No Action/No Project Alternative of 3,582 acres. Since much of the area surrounding the airport in both the Santa Monica Bay and Dominguez Channel watersheds is developed under baseline conditions, these changes would represent marginal increases in regional impervious area.

As with conditions in 2005, in 2015, the changes in impervious area would not be evenly distributed between the Santa Monica Bay and Dominguez Channel Watersheds when compared to baseline conditions. The impervious area within the Santa Monica Bay Watershed would increase 209 acres or 10 percent, while the impervious area within the Dominguez Channel Watershed would decrease by 89 acres or six percent. For reasons described above, the increase in impervious area within the Santa Monica Bay Watershed, and the associated increase in storm water peak flow rates, could potentially exceed the capacity of the storm water facilities in the Argo and Imperial sub-basins, resulting in flooding. This would be a potentially significant impact.

In order to prevent the increase in impervious area under Alternative A from causing flooding, LAWA would implement Master Plan Commitment HWQ-1. As part of the commitment, LAWA would perform a comprehensive, airport-wide drainage analysis addressing current and projected future drainage and flooding problems. This evaluation would be conducted using the LADPW's Peak Rate Method. In areas where a potential for flooding is identified, LAWA would either reduce peak flow rates to over-capacity drainage facilities or increase the drainage capacities of the facilities. Peak flow rates to these facilities could be reduced using BMPs designed to maximize the on-site detention of storm water using the measures described in Section 4.7.5, *Master Plan Commitments*. The capacities of the drainage facilities receiving runoff from LAX could also be increased by either increasing the size of the drainage facilities or constructing additional drains and outfalls. In areas where new drainage facilities are required, the facilities would be designed using the procedures of the LADPW Peak Rate Method. With implementation of Master Plan Commitment HWQ-1, potential impacts from flooding under Alternative A would be less than significant.

All facilities receiving and conveying storm water from the airport would be concrete lined under the Alternative A and, therefore, any increases in storm water peak flow rates or changes in the drainage infrastructure would not result in substantial erosion or siltation either on-site or off-site. Therefore, the impact of erosion or siltation due to runoff from the airport would be less than significant.

LAX Expressway improvements could potentially increase the amount of impervious area and redirect surface water runoff. As indicated in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*, only a nominal impact on localized drainage or downstream areas would occur.

Surface Recharge

Under Alternative A, in 2005, the volume of surface recharge within the HWQSA would increase by approximately 20 acre-feet/year to 191 acre-feet/year as compared to baseline conditions. When compared to No Action/No Project Alternative, the volume of surface recharge would increase by approximately 36 acre-feet/year. By 2015, the volume of surface recharge within the HWQSA would

decrease by 29 acre-feet/year to 142 acre-feet/year as compared to baseline conditions, and 12 acre-feet/year when compared to the No Action/No Project Alternative.

The reduction in surface recharge under both planning horizons would represent a change of less than 0.1 percent in the total groundwater inflows estimated for the West Coast Basin as compared to baseline conditions. This reduction would not substantially change groundwater storage or groundwater elevations. As indicated previously, no groundwater production occurs within the Master Plan boundaries relative to the beneficial uses designated for the West Coast Groundwater Basin. Therefore, the impact of the projected reduction in the volume of surface recharge would be less than significant.

Water Quality

Water Quality Assurance Letter

As described previously, Alternative A would increase the amount of area dedicated to airport uses. This would include changing the configuration of, and extending, major runways. As such, under USC Title 49, Section 47106(c), a letter from the State would be required for project approval stating that there is reasonable assurance that this component of the project would be designed, constructed, and operated in compliance with applicable water quality standards.

Storm Water Pollutant Loads

Under Alternative A, in 2005, total pollutant loads generated within the HWQSA would generally decrease for all pollutants of concern with the exception of total copper and oil and grease which would both increase by two percent as compared to baseline conditions. On the other hand, when compared to the No Action/No Project Alternative, total pollutant loads generated within the study area would decrease for all pollutants of concern between one percent and 31 percent, depending upon the pollutant.

The projected decrease in the majority of pollutants is due to the conversion of land within the acquisition areas from commercial, industrial, and residential land uses to airport-related land uses. The increase in total copper and oil and grease is consistent with the proposed expansion of airport operation and transportation land uses. The changes in pollutant loads would not be evenly distributed between the Santa Monica Bay and Dominguez Channel Watersheds. Within the Santa Monica Bay Watershed, all pollutants would increase due to the conversion of the Westchester Southside area from open space to mixed use development. In the Dominguez Channel Watershed, all modeled pollutants of concern would decrease as commercial and industrial land uses are converted to airport operations and airport open space. The increase in pollutant loads within the Santa Monica Bay Watershed would be a potentially significant impact.

By 2015, the total pollutant load generated within the HWQSA would increase between one percent and 10 percent for total phosphorous, the heavy metal pollutants (total copper, total lead, and total zinc), oil and grease, and chemical oxygen demand as compared to baseline conditions. However, when compared to No Action/No Project Alternative, the total pollutant load generated would decrease between four percent and six percent for the heavy metal pollutant (total copper) and oil and grease.

When compared to baseline conditions, as in 2005, the increase in pollutant load would occur primarily in the Santa Monica Bay Watershed, where all pollutants would increase due to the build out of Westchester Southside. However, in 2015, pollutant loads for total copper and oil and grease would also increase within the Dominguez Channel Watershed. These increases in pollutant loads would be a potentially significant impact.

In order to prevent an increase in pollutant loads generated under Alternative A, LAWA would implement Master Plan Commitment HWQ-1, which would require the development of a detailed drainage plan. As part of the drainage plan, LAWA would design the storm water system to meet the requirements in the SUSMP through incorporation of source control, structural, and treatment control BMPs. These BMPs would be designed with the goal of reducing impacts to water quality to the maximum extent practicable and achieving no net gain in pollutant loads discharged to receiving water bodies. Due to the relatively large area that would be redeveloped as part of Alternative A, substantial opportunities would exist to replace existing facilities with ones that incorporate water quality control BMPs into their design, construction and operations, thereby reducing total LAX-related pollutant loads. By implementing HWQ-1, the impact associated with the increased pollutant loads would be reduced to a level that is less than significant.

State Route 1 and LAX Expressway improvements could potentially increase the pollutant load discharged to receiving water bodies. However, compliance with existing local, federal and state regulations, including implementation of BMPs, would ensure that no significant impact would occur. Additional discussion is provided in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*.

Dry Weather Flows

Under Alternative A, heavy maintenance activities at LAX would decrease, thereby reducing a major source of dry weather flows and pollutant discharge from the airport when compared to baseline conditions. However, as indicated in Section 4.23, *Hazardous Materials*, airport-related activities would intensify under this alternative, potentially resulting in a greater likelihood of spills and leaks of hazardous materials. In addition, under Alternative A, the Imperial retention basin would be removed. As a result, dry weather flows that enter the storm water conveyance system from the Imperial drainage area would not be detained for treatment and all flows entering the storm drain system would discharge to either the Dominguez Channel or the Santa Monica Bay untreated. The increased potential for spills and leaks associated with intensification of land use under Alternative A and the removal of the Imperial retention basin could result in an increase in pollutant loads. This would be a potentially significant impact.

Compliance with existing regulations and airport procedures, particularly the LAX SWPPP, would reduce the likelihood of dry weather discharges and would minimize the effects of their release should such discharges occur. Incorporation of the source control, structural and treatment BMPs under HWQ-1 would further reduce the potential for pollutants to enter the storm drain system and affect receiving water bodies. With implementation of this commitment, the pollutant load generated from dry weather flows would not be expected to increase and the associated impact would be less than significant.

Construction Effects

Construction proposed under Alternative A could create sources of pollution that could potentially affect water quality. Since the proposed improvements under this build alternative would affect an area of greater than five acres, LAWA's existing construction policy would require the development of a construction SWPPP in compliance with the state's construction permit. Temporary construction BMPs specified in LAWA's existing Construction SWPPP for LAX to minimize the effects of construction activities on water quality include:

- Soil stabilization (erosion control) techniques such as seeding and planting, mulching, and check dams
- Sediment control methods such as detention basins, silt fences, and dust control
- Contractor training programs
- Material transfer practices
- Waste management practices such as providing designated storage areas and containers for specific waste for regular collection
- Roadway cleaning/tracking control practices
- Vehicle and equipment cleaning and maintenance practices
- Fueling practices

By following the procedures outlined in the SWPPP and employing the BMPs listed above, impacts to water quality associated with construction activities would be less than significant.

4.7.6.3 Alternative B – Added Runway South

As with Alternative A, Alternative B would increase the building area dedicated to terminal, cargo, and ancillary airport uses, and decrease building area for maintenance uses compared to baseline conditions. Alternative B would also include development of Westchester Southside (scaled-down LAX Northside). Existing uses in the acquisition areas would be demolished. (As with Alternative A, uses within the ANMP properties -- Belford and Manchester Square -- will be demolished as part of a separate action being undertaken by LAWA). These areas would be incorporated into the Master Plan.

Hydrology

Drainage

Under Alternative B in 2005, the total impervious area within the HWQSA would be 3,522 acres. This would represent an increase in total impervious area of 12 acres as compared to baseline conditions. However, when compared to the No Action/No Project Alternative, this would represent a decrease in total impervious area of 60 acres. Like Alternative A, these changes are marginal since most of the area surrounding the airport is developed under baseline conditions.

Locally, however, when compared to baseline conditions, the changes in impervious surfaces would not be evenly distributed between the two watersheds within the HWQSA. Within the Dominguez Channel sub-basin, impervious area would decrease as areas of industrial, commercial, and residential land uses within the acquisition areas are converted to airport open space land use. However, within the sub-basins draining to Santa Monica Bay, impervious area would increase by 102 acres (five percent) because of the conversion of some open space land uses to roadways and airport operations and the partial development of Westchester Southside. As a result, in 2005, total surface water runoff volumes and peak flows to Santa Monica Bay may increase.

Most of the increase in impervious area in 2005 would occur within the Argo and Imperial sub-basins, both of which discharge to Santa Monica Bay. As stated previously, preliminary analyses based on the LADPW Peak Rate Method indicate that the capacities of the storm water conveyance facilities within these two sub-basins are insufficient to prevent flooding. Therefore, the projected increase in impervious area, and the associated increase in surface water runoff and peak flow discharges, in the Santa Monica Bay Watershed could potentially cause flooding.

Under Alternative B by 2015, the total impervious area within the HWQSA would increase by 71 acres as compared to baseline conditions of 3,510 acres. However, when compared to the No Action/No Project Alternative, the total impervious area within the HWQSA would decrease by 1 acre.

When compared to baseline conditions, as with conditions in 2005, in 2015, the changes in impervious area would be marginal on a regional scale and evenly distributed between the Santa Monica Bay and Dominguez Channel Watersheds. Locally, the impervious area within the Santa Monica Bay Watershed would increase 144 acres (seven percent), while the impervious area within the Dominguez Channel Watershed would decrease by 73 acres (five percent). For reasons described above, the increase in impervious area within the Santa Monica Bay Watershed, and the associated increase in storm water peak flow rates, could potentially exceed the capacity of the storm water facilities in the Argo and Imperial sub-basins, resulting in flooding. This would be a potentially significant impact.

In order to prevent the increase in impervious area under Alternative B from potentially causing flooding, LAWA would implement Master Plan Commitment HWQ-1. As with Alternative A, with implementation of this commitment, potential impacts from flooding would be less than significant.

Under Alternative B, the on-site fuel farm would be relocated to either the Scattergood Generating Station or the oil refinery located south of the airport. The Scattergood Fuel Farm site would be upgraded to consist entirely of impervious surfaces and all storm water would be detained on-site. The land use at the oil refinery would not change under baseline conditions and, therefore, the percentage of impervious area would not change. Consequently, development of an off-site fuel farm at either site would not be expected to result in any flooding impacts.

As with Alternative A, facilities receiving and conveying storm water from the airport would continue to be concrete lined under Alternative B and potential increases in storm water peak flow rates or changes in the drainage infrastructure would not result in substantial erosion or siltation either on-site or off-site. Therefore, the impact associated with erosion or siltation due to runoff from the airport would be less than significant.

Surface Recharge

Under Alternative B, in 2005, the volume of surface recharge within the HWQSA would decrease from baseline conditions by approximately three acre-feet/year to 168 acre-feet/year. However, the volume of surface recharge within the study area would increase by approximately 14 acre-feet/year as compared to the No Action/No Project Alternative.

In 2015, the estimated volume of surface recharge within the HWQSA would decrease by approximately 17 acre-feet/year to 154 acre-feet/year as compared to baseline conditions, while the volume of surface recharge would be the same when compared to the No Action/No Project Alternative.

The effect of this decrease would be the same as Alternative A. As with Alternative A, the reduction in surface recharge would not substantially change groundwater storage or groundwater elevations beneath the HWQSA as compared with baseline conditions. Moreover, groundwater production would not be affected. Therefore, the impact of the projected reduction in the volume of surface water recharge would be less than significant.

As mentioned previously, the off-site fuel farm located at Scattergood Generating Station would be upgraded and consist entirely of impervious surfaces and surface water recharge would not occur. However, the groundwater below the site is composed effectively of seawater since it is directly adjacent to the Santa Monica Bay and is therefore not used to support the beneficial uses designated for the Basin. At the oil refinery site, land use and the amount pervious surfaces would not change. Therefore, the impact of the change in surface recharge would be less than significant.

Water Quality

Water Quality Assurance Letter

As with Alternative A, Alternative B would include changes in the configuration of the existing runways including major runway extensions. As such, under USC Title 49, Section 47106(c), a letter from the State would be required for project approval stating that there is reasonable assurance that this component of the project would be designed, constructed, and operated in compliance with applicable water quality standards.

Storm Water Pollutant Loads

Pollutant loads under Alternative B in 2005 would be similar to those under Alternative A. As with Alternative A, total projected pollutant loads within the HWQSA would increase for total copper and oil and grease, by five and six percent respectively, as compared to baseline conditions. On the other hand, when compared to the No Action/No Project Alternative, total projected pollutant loads would only increase for total copper by three percent.

As with Alternative A, the pollutant load that would discharge to the Santa Monica Bay Watershed would increase for all pollutants as open space within Westchester Southside is converted to mixed use development, as compared to baseline conditions. Pollutant loads discharged to the Dominguez Channel Watershed would decrease with the exception of total copper. These increases in pollutant loads discharged to receiving water bodies would be a potentially significant impact.

In 2015, the projected pollutant load from the airport under Alternative B would be expected to increase by up to eight percent for the heavy metal pollutants (i.e., total copper, total lead, and total zinc) and seven percent for oil and grease as compared to baseline conditions. However, when compared to the No Action/No Project Alternative, the heavy metal pollutant loads would decrease, with the exception of total copper.

When compared to baseline conditions, as in 2005, the increase in pollutant load would occur primarily in the Santa Monica Bay Watershed, where all pollutants would increase. In 2015, pollutant loads discharged to the Dominguez Channel Watershed would decrease, with the exception of total copper. These increases in pollutant loads would be a potentially significant impact.

In order to prevent an increase in pollutant loads generated under Alternative B, LAWA would implement Master Plan Commitment HWQ-1, which would require the development of a detailed drainage plan. As part of the drainage plan, LAWA would design the storm water system to meet the requirements in the SUSMP through incorporation of source control, structural, and treatment control BMPs. These BMPs would be designed with the goal of reducing impacts to water quality to the maximum extent practicable and achieving no net gain in pollutant loads discharged to receiving water bodies. Due to the relatively large area that would be redeveloped as part of Alternative B, substantial opportunities would exist to replace existing facilities with ones that have water quality control BMPs incorporated into their design, construction and operation thereby reducing total LAX-related pollutant loads. By implementing HWQ-1, the impact associated with the increased pollutant loads would be reduced to a level that is less than significant.

Dry Weather Flows

As with Alternative A, under Alternative B, heavy maintenance activities at LAX would decrease, thereby reducing a major source of dry weather flow pollutants from the airport. However, as indicated in Section 4.23, *Hazardous Materials*, the intensification of airport-related activities would potentially result in a greater likelihood of spills and leaks of hazardous materials. As with Alternative A, the Imperial retention basin would be removed and all dry-weather flows entering the storm drain system would potentially discharge untreated to the Dominguez Channel or Santa Monica Bay. The increased potential for spills and leaks under Alternative B and the removal of the Imperial retention basin could result in an increase in pollutant loads. This would be a potentially significant impact.

Under Alternative B, the off-site fuel farm would be relocated to either the Scattergood Generating Station or the oil refinery located south of the airport. Relocating the fuel farm to either proposed location would not result in a change in land use that would be expected to adversely affect water quality. All surface water generated within the proposed Scattergood facility would be contained by secondary containment measures, in conjunction with an on-site overflow detention basin. Surface waters collected in the containment area and the detention basin would be pumped to the Hyperion Treatment Plant for treatment. Surface water generated at the oil refinery would continue to be treated by the on-site water treatment facility. Discharges from the proposed fuel farm site would continue to be treated and regulated under the existing NPDES permit. For these reasons, the impact of the offsite fuel farm on water quality would be less than significant.

Compliance with existing regulations and airport procedures, particularly the LAX SWPPP, would reduce potential impacts associated with hazardous materials spills. By incorporating source control, structural, and treatment BMPs into the design and construction of the drainage facilities, as part of the Master Plan Commitment HWQ-1, would further reduce the potential for pollutants to enter the storm drain system. With the implementation of this commitment, the potential impacts associated with dry weather flows would be less than significant.

Under Alternative B, facilities receiving and conveying storm water from the airport are concrete lined and, therefore, increases in storm water peak-flow rates or changes in the drainage infrastructure would not result in substantial erosion or siltation either on-site or off-site. Therefore, the impact associated with erosion or siltation due to runoff from the airport would be less than significant.

Construction Effects

Construction proposed under Alternative B could create sources of pollution that could potentially affect water quality. As with Alternative A, the proposed improvements under Alternative B would affect an area of greater than five acres, requiring LAWA to develop of a construction SWPPP in compliance with the state's construction permit for the project. To minimize the effect that the construction activities would have on water quality, the SWPPP would specify temporary construction BMPs to potential BMPs that may be included would be the same as those identified under Alternative A.

By following the procedures outlined in the SWPPP and employing temporary construction BMPs, impacts to water quality associated with construction activities would be less than significant.

4.7.6.4 Alternative C – No Additional Runway

Under Alternative C, the building area dedicated to terminal, cargo, and ancillary airport uses would increase, and the building area for maintenance uses would decrease, compared to baseline conditions. Alternative C would also include development of Westchester Southside (scaled-down LAX Northside): Existing uses in the acquisition areas would be demolished. (As with Alternatives A and B, uses within the ANMP properties -- Belford and Manchester Square -- will be demolished as part of a separate action being undertaken by LAWA.) These areas would be incorporated into the Master Plan.

Hydrology

Drainage

Under Alternative C in 2005, the total impervious area within the HWQSA would be 3,514 acres. This represents an increase in total impervious area of four acres as compared to baseline conditions. When compared to the No Action/No Project Alternative (3,582 acres of impervious area), Alternative C in 2005 would have 68 fewer acres of total impervious area within the Master Plan boundaries. Since much of the

area surrounding the airport in both the Santa Monica Bay and Dominguez Channel Watersheds is developed, these changes would represent marginal increases in regional impervious area.

When compared to baseline conditions, as with Alternatives A and B, local changes in impervious surfaces would not be evenly distributed between the two watersheds within the HWQSA. Within the Dominguez Channel sub-basin, impervious area would decrease as areas of industrial, commercial, and residential land uses within the acquisition areas are converted to airport open space land use. However, within the sub-basins draining to Santa Monica Bay, impervious area would increase by 98 acres or five percent because of the conversion of some open space land uses to roadways and airport operations and the partial development of Westchester Southside. As a result, in 2005, total surface water runoff volumes and peak flows to Santa Monica Bay may increase.

Most of the increase in impervious area in 2005 would occur within the Argo and Imperial sub-basins, both of which discharge to Santa Monica Bay. As mentioned previously, preliminary analyses flooding based on the LADPW Peak Rate Method indicate that the capacities of the storm water conveyance facilities within these two sub-basins are insufficient to prevent. Therefore, the projected increase in impervious area, and the associated increase in surface water runoff and peak flow discharges, in the Santa Monica Bay Watershed could potentially cause flooding.

Under Alternative C by 2015, the total impervious area within the HWQSA would increase marginally by 77 acres as compared to baseline conditions, and five acres as compared to the No Action/No Project Alternative, resulting in a marginal increase on a regional scale.

When compared to baseline conditions, as with conditions in 2005, in 2015, local changes in impervious area would not be evenly distributed between the Santa Monica Bay and Dominguez Channel Watersheds. The impervious area within the Santa Monica Bay Watershed would increase 174 acres (eight percent), while the impervious area within the Dominguez Channel Watershed would decrease by 97 acres (seven percent). For reasons described above, the increase in impervious area within the Santa Monica Bay Watershed, and the associated increase in storm water peak flow rates, could potentially exceed the capacity of the storm water facilities in the Argo and Imperial sub-basins, resulting in flooding. This would be a potentially significant impact.

In order to prevent the increase in impervious area under Alternative C from causing flooding, LAWA would implement Master Plan Commitment HWQ-1. With implementation of Commitment HWQ-1, potential impacts from flooding would be less than significant.

As with Alternative A and B, all facilities receiving and conveying storm water from the airport would continue to be concrete lined and potential increases in storm water peak-flow rates or changes in the drainage infrastructure associated with Alternative C would not result in substantial erosion or siltation. Therefore, the impact associated with erosion or siltation due to runoff from the airport would be less than significant for areas both on- and off-site.

As with Alternative A, LAX Expressway improvements could potentially increase the amount of impervious area and redirect surface water runoff. As indicated in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*, only a nominal impact on localized drainage or downstream areas would occur.

Surface Recharge

Under Alternative C, in 2005, the volume of surface recharge within the HWQSA would decrease by approximately one acre-foot/year to 170 acre-feet/year as compared to baseline conditions. However, when compared to the No Action/No Project Alternative of 154 acre-feet/year, the volume of surface recharge within the HWQSA would increase by approximately 16 acre-feet/year.

In 2015, the estimated volume of surface recharge would decrease by approximately 19 acre-feet/year as compared to baseline conditions and 2 acre-feet/year as compared to the No Action/No Project Alternative.

The effect of this decrease would be the same as Alternatives A and B. When compared to baseline conditions, as with those alternatives, the reduction in surface recharge would not substantially change groundwater storage or groundwater elevations beneath the Master Plan boundaries. Moreover, groundwater production would not be affected. Therefore, the impact of the projected reduction in the volume of surface water recharge would be less than significant.

Water Quality

Water Quality Assurance Letter

Alternative C, similar to Alternatives A and B, would include changes in the configuration of the existing runways including major runway extensions. As such, under USC Title 49, Section 47106(c), a letter from the State would be required for project approval stating that there is reasonable assurance that this component of the project would be designed, constructed, and operated in compliance with applicable water quality standards.

Storm Water Pollutant Loads

The changes in pollutant loads in 2005 under Alternative C would be similar as those under Alternative B. Total pollutant loads discharged from the airport would increase by five percent for both total copper and oil and grease as compared to the environmental baseline and, as with Alternative B, the majority of the increase would be discharged to the Santa Monica Bay. When compared to the No Action/No Project Alternative, total pollutant loads discharged from the airport within the HWQSA would decrease, with the exception of total copper.

In 2015, the projected pollutant load from the airport under Alternative C would be expected to increase between three and eight percent for heavy metal pollutants (i.e., total copper, total lead, and total zinc) and eight percent for oil and grease as compared to baseline conditions. On the other hand, the projected pollutant loads discharged from the airport would increase by five percent for total copper and two percent for oil and grease, as compared to the No Action/No Project Alternative.

However, as in 2005, the changes in pollutant loads would not be evenly distributed between the two watersheds. When compared to baseline conditions, the pollutant load discharged to Santa Monica Bay would increase for all pollutants of concern, whereas the pollutant load discharged to Dominguez Channel would decrease for all pollutants except total copper. The increases in pollutant loads would be a potentially significant impact.

In order to prevent an increase in pollutant loads generated under Alternative C, LAWA would implement Master Plan Commitment HWQ-1, which would require the development of a detailed drainage plan. As part of the drainage plan, LAWA would design the storm water system to meet the requirements in the SUSMP through incorporation of source control, structural, and treatment control BMPs. These BMPs would be designed with the goal of reducing impacts to water quality to the maximum extent practicable and achieving no net gain in pollutant loads discharged to receiving water bodies. Due to the relatively large area that would be redeveloped as part of Alternative C, substantial opportunities would exist to replace existing facilities with ones that incorporate water quality control BMPs into their design, construction and operations thereby reducing total LAX-related pollutant loads. By implementing HWQ-1, the impact associated with the increased pollutant loads would be reduced to a level that is less than significant.

State Route 1 and LAX Expressway improvements could potentially increase the pollutant load discharged to receiving water bodies. However, compliance with existing local, federal, and state regulations, including implementation of BMPs, would ensure that no significant impact would occur. Additional discussion is provided in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*.

Dry Weather Flows

As with Alternatives A and B, heavy maintenance activities at LAX would decrease under Alternative C, although to a lesser degree than the other alternatives. This would reduce a major source of pollutants from dry weather flows at the airport. This could be offset by a potential increase in spills and leaks of hazardous materials due to an overall intensification of use at LAX. Also, as with the other build alternatives, under Alternative C the Imperial retention basin would be removed and dry weather flows entering the storm drain system would have the potential to discharge untreated to the Santa Monica Bay or Dominguez Channel water bodies. The increased potential for spills and leaks combined with the removal of the Imperial retention basin could result in an increase in pollutant loads. This would be a potentially significant impact.

Compliance with existing regulations and airport procedures, particularly the LAX SWPPP, would reduce potential impacts associated with hazardous materials spills. Incorporation of source control, structural, and treatment BMPs as part of Master Plan Commitment HWQ-1 would further reduce the potential for

pollutants to enter the storm drain system and the potential impacts of dry weather flows would be less than significant.

Construction Effects

Construction of the proposed improvements under Alternatives C would affect an area greater than five acres. In compliance with LAWA's current construction policy and the requirements of the state's construction permit, a construction SWPPP would be developed to minimize the effect that the construction activities would have on water quality Potential BMPs that may be included would be the same as those identified under Alternative A.

By following the procedures outlined in the SWPPP and employing temporary construction, impacts to water quality from construction activities would be less than significant.

4.7.7 Cumulative Impacts

As discussed under Section 4.7.3, *Affected Environment/Environmental Baseline*, LAX contributes surface water runoff to five drainage sub-basins. Of these, four are served by drainage infrastructure. These include the Dominguez Channel, Argo, Imperial, and Culver sub-basins. Past development within the Argo and Imperial sub-basins has increased surface water runoff and peak storm water discharge rates such that the current facilities do not have sufficient capacity to prevent localized flooding.

4.7.7.1 No Action/No Project Alternative

Hydrology

Drainage

Under the No Action/No Project Alternative, LAX Northside would be developed in accordance with its existing entitlements (i.e., 4.5 million square feet of office and light industrial uses). Such development would increase impervious surfaces within the Argo sub-basin and, to a limited extent, within the Culver sub-basin, with a resulting increase in surface water runoff and peak storm water discharge rates. Similarly, development of Continental City would result in increases within the Dominguez Channel sub-basin. As indicated above, the Argo sub-basin is currently over capacity as a result of development associated with past projects; hence, increased surface water runoff and peak storm water discharge rates resulting from development under the No Action/No Project Alternative would exacerbate the existing potential for localized flooding.

Relative to drainage, the most notable major project in proximity to LAX is the Playa Vista Project. Implementation of Playa Vista would result in the conversion of a substantial amount of land from existing vacant use to proposed urban uses, resulting in increased impervious area and alteration in existing drainage characteristics. It is anticipated that implementation of the Playa Vista Project would include the construction of drainage improvements necessary to meet City and County requirements. The drainage impacts, and associated drainage improvements, for Playa Vista would occur within different watersheds and sub-basins than LAX. The geographic area that contributes runoff to the same sub-basins as LAX is largely impervious, and future projects are not anticipated to contribute notable additional surface water runoff. Nevertheless, small infill projects could result in incremental changes in amounts of existing impervious surface area and/or changes to existing drainage characteristics.

Increased surface water runoff and peak storm water discharge rates resulting from the No Action/No Project Alternative, in conjunction with past projects and small cumulative projects within the Argo and Imperial sub-basins, would result in cumulative increases in runoff volumes and peak flows that would not be able to be accommodated by existing drainage infrastructure.

Surface Recharge

As described above, under the No Action/No Project Alternative, LAX Northside and Continental City would be developed in accordance with existing entitlements. As these areas are presently vacant, development would cause impervious area to increase, reducing the amount of area available for surface recharge. However, surface recharge only comprises approximately 13 percent of the total groundwater inflows within the West Coast Groundwater Basin, in which LAX is located. Sources for this recharge include precipitation, surface water streams, irrigation water from fields and lawns, and industrial and commercial wastes.

Relative to recharge, like drainage, the most notable major project in proximity to LAX is the Playa Vista Project. Implementation of Playa Vista would result in the conversion of a substantial amount of land from existing vacant use to proposed urban uses resulting in an increase in impervious area. However, only half of the Playa Vista property resides in the West Coast Basin. Changes in impervious area at the Playa Vista Project are not expected to substantially reduce the amount of recharge and reductions that do occur would most likely be offset with increased irrigation and unlined surface water features. The same net effect would also be expected for other future projects.

At LAX under baseline conditions, the volume of recharge is limited by the highly developed, relatively impervious land uses overlying the airport property and the relatively impermeable aquitards that reside beneath the surface and the regional groundwater aquifers. Since land uses overlying the Basin are already highly developed, major changes in land use would not be expected with cumulative development such that the total amount of pervious surface area within the Basin would change. Decreased surface recharge volumes resulting from the No Action/ No Project Alternative in conjunction with the minor changes in land use patterns within the West Coast Basin would not substantially reduce the volume of water recharging groundwater from the surface.

Water Quality

Continued development within the Santa Monica Bay and Dominguez Channel Watersheds, including development associated with the No Action/No Project Alternative, could potentially contribute increased pollutant loads to Santa Monica Bay, an impaired water body, and Dominguez Channel. In light of continued regional water quality impacts, the LARWQCB, which is the agency with jurisdiction over surface water quality, implemented the SUSMP regulations. These regulations, which were adopted through a process that was subject to public review and comment, provide specific requirements aimed at reducing storm water pollutant loads. The SUSMP regulations require maximizing the use of structural and treatment BMPs to reduce water quality impacts. Implementation of these requirements will avoid or substantially lessen cumulative water quality impacts to Santa Monica Bay and Dominguez Channel.

As with drainage and recharge, the most notable major project near LAX is the Playa Vista Project, which, if implemented, would convert open space land uses to urban uses. This would have the potential to increase the pollutant loads discharged from the Playa Vista property ultimately to the Santa Monica Bay. However, like LAX, the Playa Vista Project would be required to implement BMPs to reduce the effect that development would have on water quality and comply with the SUSMP regulations. These BMPs are expected to be incorporated into the construction of the project.

Development of LAX Northside and Continental City under the No Action/No Project Alternative would be required to comply with the SUSMP requirements by designing the storm water system to meet the requirements in the SUSMP through incorporation of source control, structural and treatment control BMPs. These BMPs would be designed with the goal of reducing impacts to water quality to the maximum extent practicable.

4.7.7.2 Alternatives A, B, and C

Hydrology

Drainage

As previously discussed in Section 4.7.6, *Environmental Consequences*, similar to the No Action/No Project Alternative, development associated with each of the build alternatives (Alternatives A, B, and C) would increase impervious surface area, and resultant surface water runoff and peak flows, within the Dominguez Channel and the Argo sub-basins. Development associated with the build alternatives would also affect the Imperial and Culver sub-basins. Master Plan-related improvements occurring with any of the build alternatives would be designed so that flooding within the boundary of the selected alternative would be controlled to acceptable levels.

In addition to the direct impacts associated with each alternative, as summarized above, existing drainage systems outside of the study area could be affected by any new development resulting from the relocation of residences and business within the acquisition areas, and/or from “induced” growth associated with the project. To the extent that such relocated uses or induced growth is accommodated within existing developed areas, there would be little, if any, potential for impacts on drainage; however, new development engendered by such relocated uses or induced growth would pose the potential for increased impervious area and alteration(s) of existing drainage characteristics.

Cumulative impacts could also occur as a result of future development in the vicinity of LAX. As indicated above, the most notable major project in proximity to LAX is Playa Vista. The drainage impacts associated with Playa Vista would occur within different watersheds and sub-basins than LAX and, therefore, would not contribute to cumulative drainage impacts. However, smaller infill projects within closer proximity to LAX could result in incremental increases in surface water runoff and peak storm water discharge rates, including the probable development of Manchester Square with light industrial uses under Alternative A, which, unlike Alternatives B and C, does not incorporate the property into the Master Plan.

The combined effects of the direct and indirect impacts of each of the build alternatives, in conjunction with the effects of both past and probable future projects, could result in cumulative impacts. As described above, Master Plan-related improvements would be designed to address flooding within the boundary of the selected alternative; however, increased surface water runoff and peak flows resulting from the build alternatives, in conjunction with runoff and peak flows from past and future projects, may not be able to be accommodated by the regional drainage infrastructure, particularly that serving the Argo and Imperial sub-basins. This would be a significant cumulative impact. As indicated below in Section 4.7.8, *Mitigation Measures*, the responsibility for mitigating such an impact lies with the County of Los Angeles Department of Public Works and/or the City of Los Angeles Department of Public Works, Bureau of Engineering. If the agencies with jurisdiction do not resolve deficiencies in regional drainage infrastructure identified as having insufficient capacity to convey storm water, this cumulative impact would remain significant.

Surface Recharge

The cumulative impacts of the build alternatives with respect to recharge would be the same as those described for the No Action/No Project Alternative. As with that alternative, cumulative projects are not expected to substantially reduce the amount of recharge that occurs. As a result, cumulative impacts on recharge would be less than significant.

Water Quality

As with the No Action/No Project Alternative, continued development within the Santa Monica Bay and Dominguez Channel Watersheds, including development associated with the build alternatives (Alternative A, B, and C), could potentially contribute increased pollutant loads to Santa Monica Bay, an impaired water body, and Dominguez Channel. In light of continued regional water quality impacts, the LARWQCB, which is the agency with jurisdiction over surface water quality, implemented the SUSMP regulations. These regulations, which were adopted through a process that was subject to public review and comment, provide specific requirements aimed at reducing storm water pollutant loads. The SUSMP regulations require maximizing the use of source control, structural and treatment control BMPs to reduce the discharge of pollutants from storm water conveyance systems to the maximum extent practicable. Implementation of these requirements will avoid or substantially lessen cumulative water quality impacts to Santa Monica Bay and Dominguez Channel.

Cumulative impacts could also occur as a result of future development around LAX. As indicated above, the most notable major project in proximity to LAX is Playa Vista. Runoff from the Playa Vista Project would also discharge to the Santa Monica Bay and, therefore, could contribute to cumulative water quality impacts if pollutant increased pollutant loads are not mitigated. Other small infill projects within the Santa Monica Bay and/or the Dominguez Channel could also potentially result in incremental increases in pollutant loads discharged from the project. However, most of these projects would be required to conform to SUSMP regulations, which were designed to address the cumulative effects of continued development on water quality.

The Master Plan would be required to comply with the provisions in the SUSMP. These requirements would be met by implementing Master Plan Commitment HWQ-1, which would require the development of a detailed drainage plan. As part of the drainage plan, LAWA would design the storm water system to meet the requirements in the SUSMP through incorporation of source control, structural, and treatment control BMPs designed with the goal of reducing the discharge of pollutants from storm water conveyance systems to the maximum extent practicable. By complying with the SUSMP regulations, the incremental contribution of the build alternatives to the potential cumulative impact on water quality would not be

cumulatively considerable, as defined in the *State CEQA Guidelines*, Section 15064(i)(1)[292] and, thus, would not be significant.

4.7.8 Mitigation Measures

Hydrology

Drainage

With the implementation of Master Plan Commitment HWQ-1, Alternatives A, B, and C would not have any significant impacts relative to drainage and the potential for flooding and no mitigation would be required.

The following Mitigation Measure is recommended to reduce cumulative drainage impacts within the Argo and Imperial sub-basins:

- **MM-HWQ-1.**

  Regional drainage facilities should be upgraded, as necessary, in order to accommodate current and projected future flows within the watershed of each outfall. This could include upgrading the existing outfalls, or building new ones. The responsibility for implementing this Mitigation Measure lies with the Los Angeles County Department of Public Works and/or the City of Los Angeles Department of Public Works, Bureau of Engineering. A portion of the increased costs for the upgraded flood control and drainage facilities would be paid by LAX tenants and users in accordance with the possessory interest tax laws and other legal assessments, consistent with federal airport revenue diversion laws and regulations and in compliance with state, county and city laws. The new or upgraded facilities should be designed in accordance with the drainage design standards of each agency.

Surface Recharge

Alternatives A, B, and C would not have any significant impacts relative to surface recharge and no mitigation would be required.

Water Quality

With the implementation of Master Plan Commitment HWQ-1, which identifies BMPs to reduce pollutant discharges, Alternatives A, B, and C would not have any significant impacts relative to water quality and no mitigation would be required.

4.7.9 Level of Significance After Mitigation

Cumulative drainage impacts resulting from development of Alternatives A, B, or C, including potential cumulative hydrology impacts resulting from the LAX Expressway and State Route 1 improvements (described in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*), could be mitigated through implementation of Mitigation Measure HWQ-1.

[292] As defined in the noted section, "cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." In accordance with the State CEQA Guidelines, Section 15130(a)(3), "A project's contribution is less than cumulatively considerable if the project is required to implement… its fair share of a Mitigation Measure or measures designed to alleviate the cumulative impact."