APPENDIX C

AIR QUALITY ANALYSIS

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COLORADO LAGOON RESTORATION PROJECT

LONG BEACH, CALIFORNIA

LSA

May 2008

AIR QUALITY ANALYSIS

COLORADO LAGOON RESTORATION PROJECT

LONG BEACH, CALIFORNIA

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LSA Project No. CLB0702

LSA

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TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

EXECUTIVE SUMMARY

LSA Associates, Inc. (LSA) was retained to prepare an air quality study for the proposed Colorado Lagoon Restoration Project, located in the City of Long Beach (City) in Los Angeles County (County), California.

The air quality study provides a discussion of the proposed project, the physical setting of the project area, and the regulatory framework for air quality. The report provides data on existing air quality, evaluates potential air quality impacts associated with the proposed project, and identifies mitigation measures recommended for potentially significant impacts.

Emissions generated during construction of the proposed project would exceed the South Coast Air Quality Management District's (SCAQMD) oxides of nitrogen (NO_X) threshold. In addition, the localized significance analysis shows that the construction emissions would exceed the PM_{10} and $PM_{2.5}$ localized significance thresholds. Compliance with the SCAQMD Rules and Regulations during construction will reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions. However, these emissions would remain significant and unavoidable.

The proposed project would not result in any long-term on-site stationary sources and would have a minimal change in the off-site vehicle trips. The project's long-term air quality impacts would be less than significant because there would be no increase in stationary or mobile source emissions. Historical air quality data show that existing carbon monoxide (CO) levels for the project area and the general vicinity do not exceed either the State or federal ambient air quality standards (AAQS). Because the proposed project would have little to no change in off-site vehicle trips, no significant CO contributions would occur in the project vicinity.

The evaluation was prepared in conformance with appropriate standards, utilizing procedures and methodologies in the SCAQMD California Environmental Quality Act (CEQA) Air Quality Handbook.

PROJECT DESCRIPTION

This air quality analysis has been prepared to evaluate the potential air quality impacts and mitigation measures associated with the habitat and recreation improvements to the Colorado Lagoon (Lagoon) and adjacent areas, including Marina Vista Park, which comprise a 48.61-acre (ac) project area/park site in the City of Long Beach (City), as shown on Figure 1.

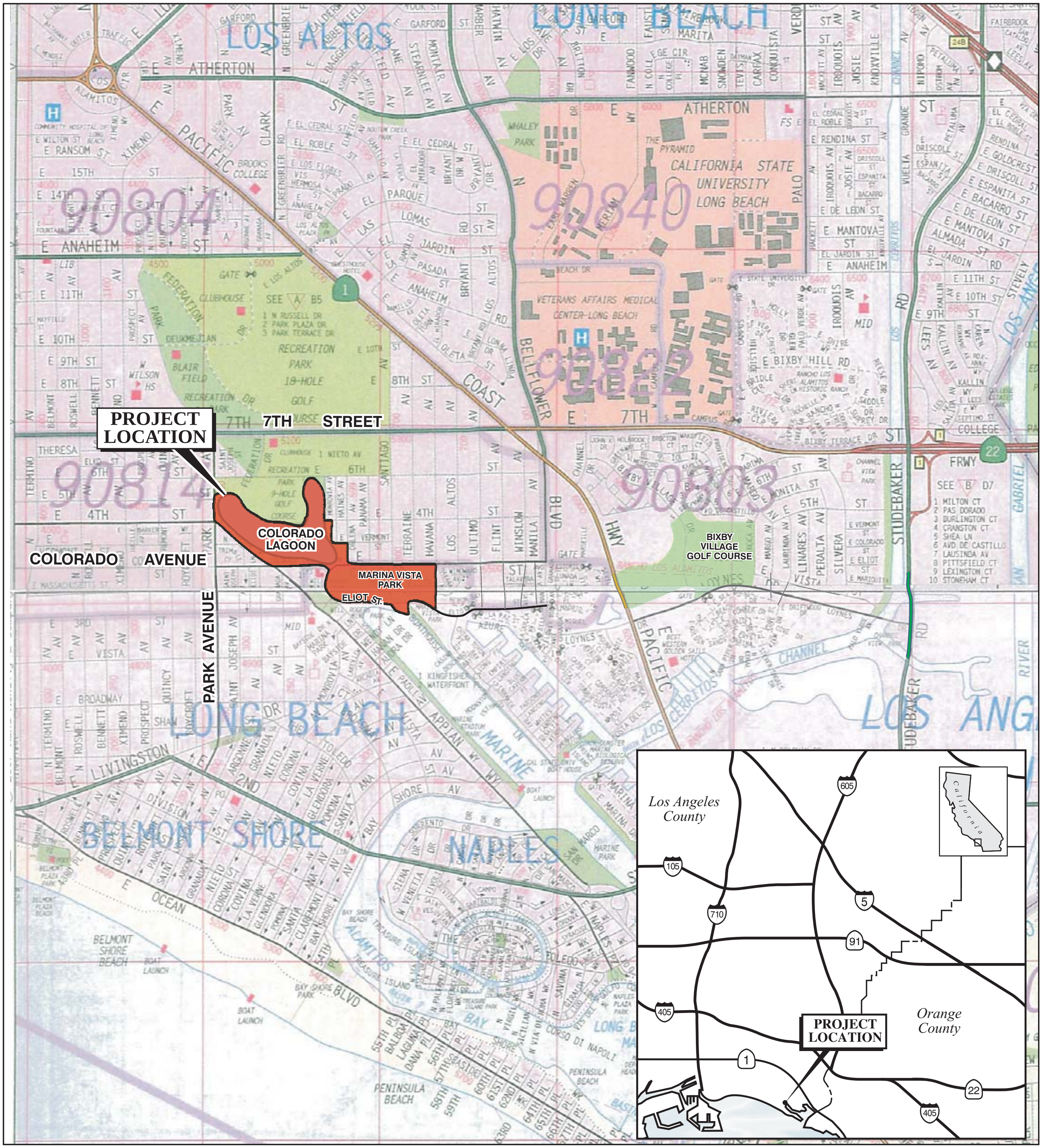
The Lagoon is an approximately 11.7 ac tidal water body[1] that is connected to Alamitos Bay and the Pacific Ocean through an underground tidal culvert to Marine Stadium. The Lagoon is located in a park setting and is owned and maintained as a City park by the City Department of Parks, Recreation, and Marine. The Lagoon serves three main functions: hosting estuarine habitat, providing public recreation (including swimming), and retaining and conveying storm water drainage. The water and sediment quality within the Lagoon are degraded. The Lagoon is listed on California's 303(d) list of impaired water bodies due to elevated levels of lead, zinc, chlordane, and polycyclic aromatic hydrocarbons (PAHs) in the sediment and chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, and polychlorinated biphenyls (PCBs) in fish and mussel tissue. In addition, testing confirmed the presence of PCBs, cadmium, copper, mercury, and silver as secondary contaminants of concern. Bacterial contamination of the Lagoon water is also a major concern. The purpose of the proposed project is to restore the site's ecosystem, provide enhanced recreation facilities, and improve water and sediment quality while managing storm water.

PROJECT LOCATION

The City is approximately 20 miles (mi) south of downtown Los Angeles and is adjacent to the Pacific Ocean. The Lagoon and Marina Vista Park (proposed project site) are located in the southwestern portion of the City. The Lagoon lies northwest of the mouth of the San Gabriel River and is north of Marine Stadium and Alamitos Bay. The Lagoon is primarily accessible from East Appian Way and East Colorado Street via Park Avenue from East 7th Street. However, many local streets provide access to the Lagoon and its surrounding areas. Regional access to the project site is provided by Interstate 405 (I-405), Interstate 605 (I-605), and Interstate 710 (I-710) to the north and west. Figure 1 shows the project location.

Recreation Park is adjacent to the Lagoon on the north and includes a 9-hole and 18-hole golf course, a baseball stadium, a casting pond, picnic areas, a dog park, tennis courts, a community center, lawn bowling, and a playground. In addition, Marina Vista Park is located to the southeast of the Lagoon, on the south side of East Colorado Street. Marina Vista Park overlooks the water of Marine Stadium to the south and provides the following amenities: two soccer fields, tennis courts, a baseball diamond, play equipment, picnic areas, and restrooms. Additionally, Marina Vista Park is the

1 Lagoon water body acreage was estimated by LSA Associates, Inc. (LSA) geographic information systems (GIS) based on a 2006 aerial photo and varies with the tides.



LSA

FIGURE 1

PROJECT AREA

N

0 1000 2000

FEET

SOURCE: Thomas Guide, 2007

Colorado Lagoon Restoration Project

Project Location

I:\CLB0702\G\Location2 fig1.cdr (4/7/08) site of municipal band concerts in the summer. Both Recreation Park and Marina Vista Park are owned and operated by the City Department of Parks, Recreation, and Marine. Residences and public schools surround the other portions of the Lagoon. The proposed project includes improvements within Marina Vista Park.

The Colorado Lagoon Playgroup Preschool, which is a program for three- to five-year-old children, and a model boat shop are located on the south side of the Lagoon. Other on-site facilities include the City's Colorado Lagoon Marine Science Center, which is staffed by the City and Friends of the Lagoon (FOCL), restrooms, parking, a pedestrian bridge, a lifeguard station, sandy shoreline areas, play equipment, picnic areas, and grassy open-space areas.

PROJECT OBJECTIVES

Pursuant to Section 15124 of the California Environmental Quality Act (CEQA) Guidelines, the description of the proposed project contains a statement of the objectives sought for development of the proposed project.

The Lagoon Restoration Project is a comprehensive plan for enhancement of the Lagoon, which is owned and maintained by the City Department of Parks, Recreation, and Marine. The City is committed to preserving and improving the open space, recreational resource, and biodiversity that this area provides. The primary goals of the proposed project are to: (1) create habitat that can successfully establish and support native plant and animal communities in the long term, (2) implement long-term water quality control measures, and (3) enhance the Lagoon's value as a recreational resource. The proposed project provides a framework to coordinate these various and potentially competing interests.

Specifically, the objectives of the proposed project are to:

- Reduce and treat storm and dry weather runoff to minimize contamination of water and sediment in the Lagoon.
- Improve water quality by increasing the Lagoon's circulation and enhancing the tidal connection with Marine Stadium.
- Improve water quality by removing contaminated sediments.
- Restore and maintain the estuarine habitats.
- Balance flood control, water quality, and the recreation demands of the Lagoon.
- Enhance public enjoyment of the Lagoon.

The project objectives listed above are intended to implement the following goals, objectives, and policies of the City's Open Space and Recreation Element of the General Plan and the Long Beach Department of Parks, Recreation, and Marine Strategic Plan:

- Develop well-managed, viable ecosystems that support the preservation and enhancement of natural and wildlife habitats (Open Space and Recreation Element, Goals/Objectives 1.1).

- Preserve, keep clean, and upgrade beaches, bluffs, water bodies and natural habitats (Open Space and Recreation Element, Goals/Objectives 1.2).
- Design and manage natural habitats to achieve environmental sustainability (Open Space and Recreation Element, Goals/Objectives 1.4).
- Promote the creation of new and reestablished natural habitats and ecological preserves, including wetlands, woodlands, native plant communities, and artificial reefs (Open Space and Recreation Element, Policy 1.1).
- Protect and improve the community's natural resources, amenities, and scenic values, including nature centers, beaches, bluffs, wetlands, and water bodies (Open Space and Recreation Element, Policy 1.2).
- Promote and assist with the remediation of contaminated sites (Open Space and Recreation Element, Policy 1.4).
- Restore Lagoon to serve as both a productive wetland habitat and recreational resource by reducing pollutant discharges into the water, increasing water circulation with Alamitos Bay, and/or restocking or planting appropriate biological species (Open Space and Recreation Element, Program 1.6).
- Maintain a sufficient quantity and quality of open space in the City to produce and manage natural resources (Open Space and Recreation Element, Goals/Objectives 2.1).
- Preserve, enhance, and manage open areas to sustain and support marine life habitats (Open Space and Recreation Element, Policy 2.4).
- Make all recreation resources environmentally friendly and socially and economically sustainable (Open Space and Recreation Element, Goals/Objectives 4.5).
- Establish lifetime use opportunities. Recreation programs and facilities will be designed to develop and serve a lifetime user through active, passive, and educational experiences (Department of Parks, Recreation, and Marine Strategic Plan, Strategy 9, page 62).
- The Department of Parks, Recreation, and Marine should be a steward for preserving the environmental, cultural, and historical resources in the City (Department of Parks, Recreation, and Marine Strategic Plan, Strategy 11, page 63).
- Support efforts to improve the water quality and cleanliness of City beach areas (Department of Parks, Recreation, and Marine Strategic Plan, Strategy 13, page 66).

PROJECT COMPONENTS

Improvements Benefiting Water and Sediment Quality

Improved water and sediment quality would enhance recreational opportunities at the Lagoon, may lead to a more diverse invertebrate and fish community, and would increase the potential for the Lagoon to support a variety of plant and animal species.

Clean Culvert and Remove Tidal Gates, Sill, and Other Structural Impedances. This is a short-term project component that would be superseded by development of the open-channel component, as described later in this Section.

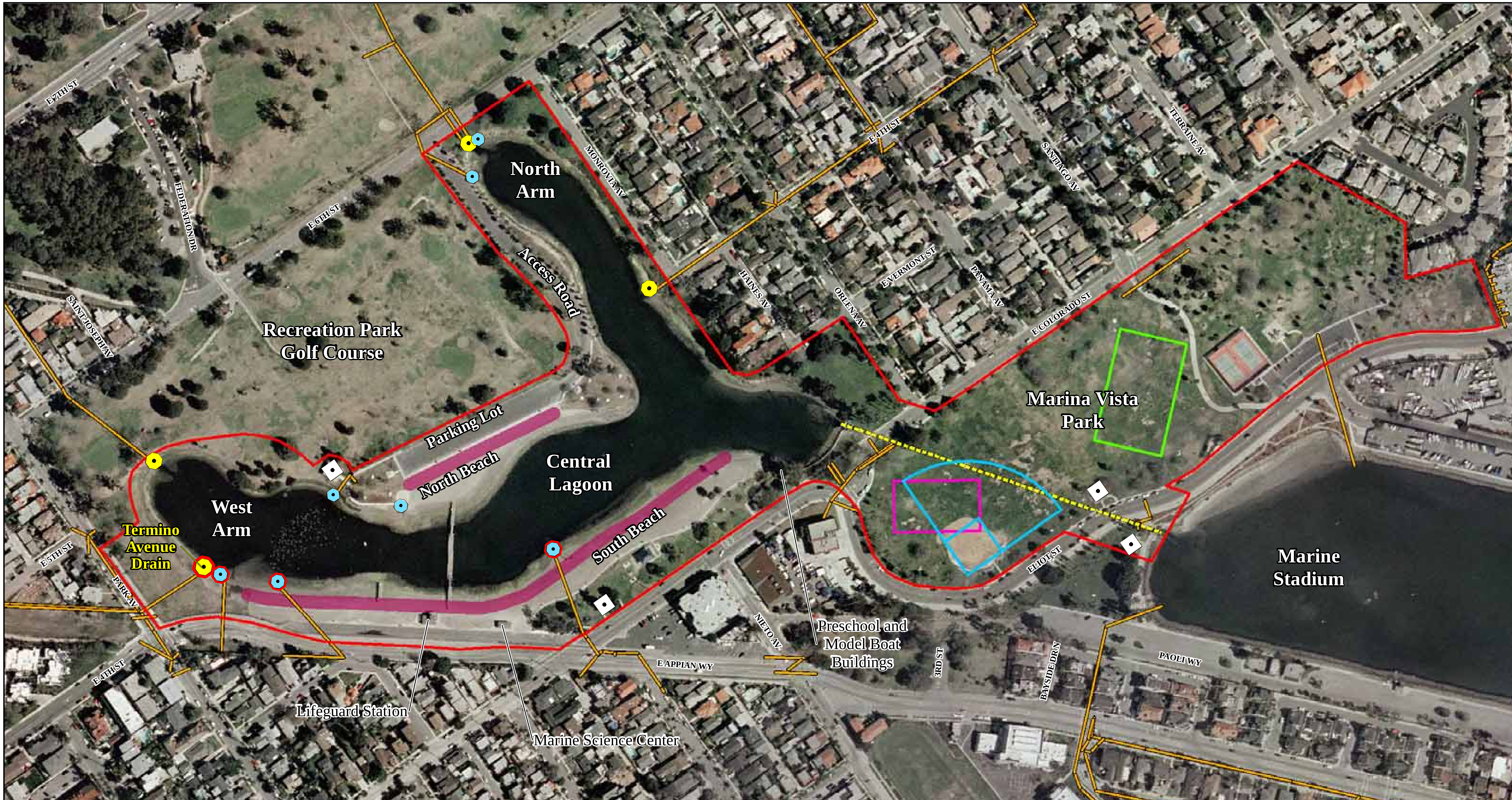
Currently, the Lagoon is connected to Marine Stadium via an underground box culvert under Marina Vista Park. The culvert is approximately 900 feet (ft) long and provides tidal exchange between the Lagoon and Marine Stadium. The cross-section of the culvert is not constant throughout its length. The opening on the Lagoon side is 14 ft wide by 7 ft high, and the opening on the marine stadium side is 12 ft wide by 8 ft high. The existing culvert location and length are shown in Figure 2. The existing culvert design and degraded condition is limiting the amount of tidal flushing between Marine Stadium and the Lagoon, which contributes to the Lagoon's water quality problem. Measured tide data shows that spring low tides in the Lagoon are perched above those of Marine Stadium and the ocean by approximately 3 ft. This indicates that something in the culvert restricts the low tide elevation from dropping below a certain level. There is also a tidal time lag between the Marine Stadium and the Lagoon, which further indicates a reduction in tidal exchange.

The existing culvert has not been cleaned since it was built in the 1960s. Because of this, the culvert is impeded by sediment that has accumulated on the bottom, extensive marine growth that has accumulated on the sides and ceiling, and debris that is trapped within the trash racks on the tide gate screens at both ends of the culvert. The culvert was most recently inspected via a dive survey in 2005, which covered the entire length of the culvert, and measurements were taken every 50 ft. The amount of sediment buildup on the floor ranged from 9 to 30 inches (in) along the length of the culvert and was mainly clam and mussel growth with some sand mixed in. The side walls had up to 3 in of soft and hard barnacle and mussel growth on them. The top of the culvert had up to 4 in of soft and hard mussel growth.

In addition, sills exist within the culvert. The sills perch the Lagoon's low tide level, thus limiting the Lagoon's tidal range and tidal flushing. On the Marine Stadium side, there is a visible rock basin sill at the entrance to the culvert that causes impedance of tidal flow. The 2005 dive survey noted that rocks are 3.5 ft above the invert and "are impeding the flow out of the Lagoon." A structural sill may also be present within the culvert at the Lagoon end.

There are side-by-side motorized tide gates on the Lagoon end of the culvert that are in a degraded condition. The gates were designed to be able to open 7 ft on the Lagoon side. However, lack of maintenance has caused the gates to not operate to this design capability and to only open to approximately 5.5 ft high.

Cleaning the existing culvert and removing impedances to flow is a short-term component of the proposed project. To implement this component, the culvert would have to be plugged to prevent flow through it. This would be done by removing the trash racks and installing "stop logs" (sheet pile or timber panels) within the vertical slots found on both ends of the culvert. The remaining water would be pumped out to the nearest water body. The culvert design includes removable access panels on the top to allow for a small track-loader and cleaning equipment to be lowered into the culvert by crane. The track-loader and hydroblasting equipment would scrape the bottom, sides, and ceiling to remove sediments and marine growth. The sediment collected by the track-loader would be removed via excavator (or a crane with a bucket) through an access opening and hauled off site. All of the



LSA

LEGEND

- Project Boundary
- Culvert
- Sand Nourishment Areas
- Existing Storm Drain Pipelines
- Existing Restrooms
- Major System Outfall
- Local Drain
- Indicates Drain Diverted by Termino Project
- Baseball Field
- Adult Soccer Field
- Youth Soccer Field

0 125 250 Feet

FIGURE 2

Colorado Lagoon Restoration Project

Existing Conditions

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

I:\CLB0702\GIS\ExistingConditions_Fig3.2.mxd (5/9/08) impedances would be removed from in and around the culvert, and the tide gates would be removed to provide a maximum culvert opening size. It is estimated that up to 900 cubic yards (cy) of sediment and trash and 130 tons of rock would be removed and hauled off site.

Cleaning the culvert and trash racks and removing the tidal gates, sill, and other structural impedances would result in an increase in the tidal range and tidal flushing, which would in turn increase water circulation throughout the Lagoon. Increased tidal ranges and tidal flushing are anticipated to result in a notable improvement in water quality. As mentioned previously and further described below, culvert cleaning and removing impedances is a near-term component. The ultimate improvement would be replacement of the culvert with an open channel.

Build Open Channel between Lagoon and Marine Stadium. This is a long-term project component that will supersede the previous component. This component consists of replacing the existing concrete box culvert with an open channel that would run from the Lagoon through Marina Vista Park to Marine Stadium in generally the same alignment as the existing culvert. Creating an open channel would improve tidal flushing by increasing the tidal range and result in a corresponding improvement in water and habitat quality. In addition, it would provide improved flood flow conveyance.

The proposed open channel would run a meandering course from the Lagoon to Marine Stadium in approximately the same alignment as the existing culvert. The channel would have curvilinear edges to create a natural-looking feature. The open channel will be characterized by a soft bottom and gently sloping banks and constructed with erosion-control blankets and riprap on the curves to maintain the integrity of the channel design, native landscaping buffer areas along the banks, and a walking trail along the eastern bank. The open channel would be 14 ft deep, have 3:1 (H:V) side slopes, and would be approximately 100 ft across at the top. This design would provide an aesthetically pleasing, natural-looking feature and also provide for biological enhancements such as marsh areas and eelgrass beds.

The existing culvert will be daylighted and excavated further as part of the open channel construction. The open channel design has a cross-sectional area large enough to provide unrestricted tidal flows between the Lagoon and Marine Stadium, which would maximize tidal flushing of the Lagoon. The channel would be deeper than the lowest predicted tidal water level and higher than the highest predicted design flood levels. This would be at least as low as 7 ft below the mean sea level (msl) for tides and as high as 2 ft aboveground (low dikes) along its banks to provide sufficient freeboard to protect against a 50-year flooding event.

A landscaped buffer would be installed along the sides of the channel. The landscaped buffer would contain a mixture of armor rock and native plantings that would also create a safety barrier where necessary. A meandering walking trail would be installed on the eastern side of the channel. This walking trail would connect to the proposed walking trail at the Lagoon, across East Colorado Street. Two vehicular bridges with pedestrian and bicycle facilities would be built over the open channel at East Colorado Street and East Eliot Street crossings, in order to maintain existing traffic circulation. One bridge would be for East Colorado Street and one for East Eliot Street. In addition, two existing public restrooms near the Marine Stadium end of the proposed open channel (one in Marina Vista

Park and one south of East Eliot Street) will be demolished and replaced with the new public restroom design that is recommended by the Long Beach Police Department.

Remove Contaminated Sediment in the Western Arm. The Lagoon is listed as impaired on California's 303(d) list of water quality limited segments, due to lead, zinc, chlordane, and PAHs in the sediment and chlordane, DDT, dieldrin, and PCBs in tissues of marine organisms. These contaminants were deposited over time from the particulates in the runoff brought to the Lagoon through the existing storm drains. Sediment sampling was conducted in 2004 and 2006 to determine the depths and spatial distribution of contamination within the Lagoon. Both surveys confirmed the presence of the 303(d) list constituents and indicated a strong contamination gradient with high levels of contaminants in the western arm of the Lagoon, transitioning to much lower levels toward the central Lagoon area. Five metals, including cadmium, copper, lead, mercury, and zinc, exhibited this distributional pattern. Among the organic contaminants, DDT compounds, chlordane, dieldrin, PCBs, and PAHs also demonstrated this strong gradient. It is estimated that the layer of contaminated sediment reaches 4 to 5 ft deep. Removal of sediment to a depth of 6 ft provides a safeguard that only clean sediment remains. Hence, the excavation design is based on removing 6 ft of sediment at the uppermost portion of the western arm, with the excavation depth gradually decreasing toward the footbridge. The sediment assessments concluded that the existing pedestrian footbridge provides a reasonable and conservative boundary for removal of the contaminated sediment. The depth of excavation at the deepest point would be down to 19 ft below the msl point of 1929. The width of the excavation footprint is intended to be as wide as possible to remove the maximum quantity of sediment while still providing for stable side slopes around the Lagoon perimeter. Slopes are to be dredged to create a smooth transition from the Lagoon floor up the side slopes. Approximately 16,000 cy of sediment would be removed from the western arm of the Lagoon.

There are two methods related to dredging and disposing of the contaminated sediment within the western arm of the Lagoon. The dry dredge method would install a temporary cofferdam just west of the footbridge to isolate the west arm of the Lagoon. The dredge areas would be drained of water, and the bottom sediment would be dewatered. An excavator would be used to remove the dry sediment, which would be temporarily stockpiled in the parking lot along the Lagoon's north shore. Plastic tarps and containment structures would be placed under and around the stockpile area to minimize runoff back into the Lagoon and surrounding areas. Due to the contamination levels within the western arm of the Lagoon, the dredge materials from this Lagoon location would be hauled to a Class 1 hazardous waste disposal facility or an approved Port of Long Beach site via truck.

The second method, which is the wet dredge method, would not dewater the west arm of the Lagoon prior to dredging. The dredge areas would be isolated by a silt curtain to maintain water quality. Clamshell/bucket-type dredging equipment would be used and temporary shore-perpendicular berms or piers would be built into the Lagoon to allow the dredger to access depths not within reach from the Lagoon's shores. Similar to the first method, the dredged material would be temporarily stock-piled in the parking lot along the northern shore until it was drained and loaded onto trucks. Plastic tarps and containment structures would be placed under and around the stockpile areas to minimize runoff back into the Lagoon and surrounding areas.

Remove Sediment in the Central Lagoon. The sediments in the central region of the Lagoon contain levels of lead, mercury, silver, DDT, and chlordane that are not hazardous per State standards. This project component would remove sediment and sand that has eroded and been deposited into the Lagoon waters over the years and create a larger subtidal area. Approximately 5,500 cy of sediment would be removed from the central Lagoon utilizing the wet dredge method discussed previously.

Storm Drain Upgrades. There are 11 storm drains that currently discharge into the Lagoon, as identified on Figure 2. Four of these are major system outfalls, serving large areas of the watershed. One of the major system outfall structures entering the Lagoon is called the Termino Avenue Drain and is currently proposed by the County of Los Angeles to be modified to no longer discharge into the Lagoon. Instead, the drain would bypass the Lagoon and discharge storm water flows into Marine Stadium and dry weather flows into the sanitary sewer system. This project would also redirect flows from three other storm drains located on the south shore of the Lagoon that currently discharge into the Lagoon. The drains that would be diverted by the County Termino Avenue Drain Project (TADP) are shown on Figure 2. The purpose of the TADP is to construct a storm drain that would alleviate flooding problems in the area and accommodate a 50-year storm event.

The implementation of the County project affects the proposed improvements to the Lagoon because one major storm drain and three local storm drains would no longer discharge into the Lagoon. In addition, the TADP would abandon in place the four existing drain discharge structures at the Lagoon. The proposed Lagoon project would close off the ends of these drains and remove the outlet structures. For the purposes of the proposed project and environmental documentation, it is assumed that the TADP will be implemented.

The storm drain upgrade components of the Lagoon Restoration Project would upgrade the seven remaining storm drains (three major system outfalls and four local drains) that discharge into the Lagoon. These components would redirect or treat storm and low flows from these drains to minimize contamination of water and sediment. Specifically, this project component consists of:
(1) development of vegetated bioswales to treat discharge from the four local drains along the north shore of the Lagoon (discussed further below under a separate project component); (2) construction of low-flow and storm first-flush diversions to a water storage area (wet well) that would discharge into the sanitary sewer system from the three remaining major system outfall drains; and (3) installation of trash separation devices on the same three remaining major system outfall drains.

The trash separation devices would trap trash and debris prior to entering the wet well for the diverted runoff and/or discharge into the Lagoon during storm events. These filtration devices would be installed within the pipe just upstream of the diversion structure. These filtration devices would need to be cleaned on a periodic basis. The storm drain locations and the proposed upgrades are shown in Figure 3.

To divert dry weather flow and the first storm flows, diversion structures/mechanisms would be installed a short distance upstream of the discharge ends of the three major system outfalls. The diversion system would be designed so that storm flows would bypass the diversion and discharge directly into the Lagoon, whereas the dry weather runoff and storm first-flush discharges would be diverted to a wet well. The diversion system would include flow meters and valve control devices such that during a large storm event, the control device would shut off when the meter indicated that

LSA

0 100 200 Feet

LEGEND

- Project Boundary
- Major System Outfall with Trash Separation Device
- Proposed Bioswale
- Proposed Open Channel (Top of Channel 100')
- Proposed Stormwater Diversion Pipes
- Proposed Wetwell
- Existing Storm Drain Pipelines
- Dredge Area
- Shrubs
- Vegetated Buffer/Berm

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

FIGURE 3

Colorado Lagoon Restoration Project

Proposed Water and Sediment Quality Improvements

I:\CLB0702\GIS\Noise_Fig3_WaterSedimentImprovements.mxd (5/9/08) the flow had reached the upset limit of the available storage within the wet well. One-way flap gates would be installed at the end of these storm drain pipes so as to preclude tidal saltwater from entering into the storm drain (and, thus, potentially the sanitary sewer diversion system) while allowing storm flows to freely discharge into the Lagoon.

New diversion pipes would be installed underground to carry the diverted storm water from the storm drain outlet locations to the underground wet well. The underground wet well and aboveground pump station would be built on the golf course at the corner of East 6th Street and Park Avenue. The size of the underground wet well would be approximately 40 ft by 40 ft and 12 ft deep. The locations of the new diversion pipes and wet well are shown on Figure 3. The runoff collected in the wet well would be pumped via the County sewer line located on East 6th Street near the intersection of Park Avenue to the Los Angeles County Sanitation Districts treatment plant. Due to a County-imposed restriction, pumping operations would be limited to only certain times of day (midnight to 5:00 a.m.).

Replace Local Hard Drain Outlets in the Lagoon with Vegetated Bioswales. As discussed above, 4 of the 11 storm drains that discharge into the Lagoon would be diverted to Marine Stadium as part of the TADP, and this project would upgrade the remaining three major outfall drains with end-of-pipe diversion systems and trash separation devices. The flows from the remaining four local storm drains would be treated via vegetated bioswales. Bioswales would also be developed on the north shore between the Lagoon and Recreation Park Golf Course. These vegetated bioswales would treat storm water and dry weather runoff through filtration to remove sediment and pollutants prior to discharge into the Lagoon. The bioswales would treat the discharge from the local drains and any runoff from the golf course. The swales are designed to be 3 ft deep and 15 ft wide at the top. The swales would have a V-shaped cross-section with sides sloping at a 2:1 ratio down to the channel centerline.

Approximately 2,500 cy of sediment would be removed as a result of the development of the bioswales. The sediment from the proposed bioswale areas is not considered hazardous and will be disposed of at an appropriate undesignated landfill.

Habitat Improvements

Remove North Parking Lot and Access Road and Create Side Slope Recontouring and Revegetation. This component would remove the existing access road from East 6th Street and the parking lot on the north shore of the Lagoon and create native upland, marsh, and intertidal habitat areas around the Lagoon. Habitat areas would be created through native vegetation planting and Lagoon bank recontouring that would promote the establishment of salt marsh habitat, including intertidal zones. The objective of this component is to restore and improve the estuarine habitat. This component also includes demolishing the existing restroom on the north shore of the Lagoon. The existing recreation improvements (e.g., barbeques and picnic tables) will remain on the north shore of the Lagoon.

The north parking lot and access road would be removed to provide more space for native vegetation planting and habitat restoration. The existing access road from East 6th Street is a private road on City property that is open to the public. The road functions as a driveway to the north parking lot.

In many areas of the Lagoon, the existing banks are steep and intertidal habitat area is limited. In addition, no substantial native upland habitat exists at the Lagoon. Most of the shoreline areas of the Lagoon are composed of ornamental landscaping and nonnative vegetation.

The slopes of several areas of the Lagoon shoreline would be recontoured to create areas for the establishment of salt marsh habitat. The approach to designing the area of intertidal habitat is to flatten the entire intertidal slope by installing a bench-type of feature between elevations of -1.75 ft and +1.5 ft above mean sea level (amsl). The bench represents a longer, flatter, sandy-bottomed slope that is exposed at low tide and inundated at high tide and where cordgrass (*Spartina foliosa*) and mudflat habitat would colonize. The new side slope profiles would be designed to maximize the area within this elevation range. Pickleweed (*Salicornia* spp.) habitat will colonize elevations between +1.5 and +2.75 ft amsl (mid-marsh). High marsh/upland habitat will be established at elevations between +2.75 ft and +5.0 ft amsl. Any existing exotic vegetation in this area would be removed. Native salt marsh species would be planted in the appropriate elevation ranges and maintained until the habitats are established and self-sustaining (Figure 4).

Vegetated biological buffer strips consisting of aesthetically appealing native shrubs and grasses would be installed in various areas. The buffer strip species would be selected and located according to the desired viewsheds throughout the buffer alignment to allow for a combination of visual screening using taller species and to allow for viewsheds through the use of low-growing species and species that can be selectively pruned.

Recontouring of the side slopes would be done concurrently with sediment removal of the western arm and central Lagoon areas. The recontouring component would generate approximately 5,100 cy of material. Some of this material is presumed to be contaminated. Therefore, the excess recontouring sediment would be disposed of with the dredge material from the western arm.

A meandering trail (as also discussed under recreational improvements and shown in Figure 5) composed of compacted decomposed granite would course the perimeter of the Lagoon, with the exception of the western arm. The trail would be generally 8 ft wide, except along the north shore, where the access trail from Sixth Street would be 12 ft wide to provide emergency access along the western shore of the northern arm.

The removal of nonnative vegetation and installation of native vegetation would include the following areas:

- **Western Arm/Western Shore.** The existing exotic vegetation (grass) would be removed, existing native saltgrass (*Distichlis spicata*) would be salvaged for transplantation in appropriate areas, and native vegetation (including an area with upland habitat) would be installed.
- **Western Arm/Eastern Shore.** The existing exotic vegetation (shrubbery and grass) would be removed, and native vegetation would be installed.
- **Northern Arm/Northwestern Corner.** The existing exotic vegetation, Mexican fan palms (*Washingtonia robusta*), would be removed, and native vegetation would be installed.

LSA

LEGEND

- Project Boundary
- Low Marsh (Coastal Salt Marsh, Cordgrass, Unvegetated Mud Flats)
- Mid Marsh
- High Marsh/Upland
- Native Upland CSS Vegetation
- Park
- Parking/Road
- Sand
- Shrubs
- Trail (Decomposed Granite)
- Vegetated Buffer/Berm
- Proposed Bioswale
- Existing Sidewalk
- Proposed Bridge
- Proposed Open Channel (Top of Channel 100')
- Proposed Viewing Platform

0 100 200 Feet

FIGURE 4

Colorado Lagoon Restoration Project

Proposed Habitat Improvements

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

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LSA

0 125 250 Feet

- Project Boundary
- Swimming Area
- Sand Nourishment Area
- Existing Sidewalk
- Proposed Bioswale
- Bird Island
- Proposed Trail (Decomposed Granite)
- Vegetated Buffer/Berm
- Proposed Bridge
- Proposed Open Channel (Top of Channel 100')
- Proposed Viewing Platform
- Baseball Field (New Location)
- Adult Soccer Field (Existing Location)
- Youth Soccer Field (New Location)
- Access Road and Parking Lot to be removed with proposed project

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

FIGURE 5

Colorado Lagoon Restoration Project
Proposed Recreation Components

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- **Northern Arm/Northeastern Corner.** This area would remain in the existing condition. The park setting will be retained to allow for ongoing existing public recreational uses.
- **Eastern Shore.** The existing exotic vegetation (iceplant) would be removed, and a native vegetation buffer consisting of selected coastal sage scrub components would be installed.
- **Southern Shore.** Low shrubs would be installed between the concrete walk path and the sand (near the playground equipment), along the street-side sidewalks of East Colorado Street and East Appian Way, along the East Appian Way parallel parking strip (near the lifeguard station), and along the edge of the sand. In addition, the asphalt strip that currently exists between East Appian Way and the Lagoon access road parking area would be removed and planted with native trees and shrubs. The type and spacing of the trees and shrubs would be designed to minimize obstruction of the view from the homes to the southwest. This portion of the component would involve some demolition of pavement. Pavement debris would be hauled off site. New topsoil would be imported as necessary for the areas to be replanted. Irrigation lines and new plants would be installed. In addition, along the southwestern shore, a berm would be installed along Park Avenue. Both the shrubs and the berm would reduce the storm water sheet flow that currently enters the Lagoon from these areas during storm events.

A conceptual planting plan showing the proposed new vegetation communities is shown on Figure 4. These habitats would support a diversity of native plant species that would be used by native birds, primarily for foraging and resting. The restored habitat is expected to increase the abundance and diversity of birds using the Lagoon and would provide viewing and educational opportunities for the public.

Import and Plant Eelgrass in the Lagoon. There are small patches of eelgrass currently existing in the Lagoon that would be supplemented by planting additional eelgrass and creating eelgrass beds. Eelgrass beds are nutrient-rich and extremely productive, providing food and shelter for a variety of marine invertebrates and fishes.

Eelgrass (*Zostera*) is a marine flowering plant that grows in soft sediments in coastal bays and estuaries, and occasionally offshore to depths of 50 ft. Eelgrass canopies are approximately 2 to 3 ft long (consisting of shoots and leaves). This vegetation enhances the abundance and diversity of the habitat by attracting many marine invertebrates, fishes, and marine life. Diverse communities of bottom-dwelling invertebrates (i.e., clams, crabs, and worms) live on eelgrass or within the soft sediments that cover the root and rhizome mass system. The vegetation also serves a nursery function for many juvenile fishes, including species of commercial and/or sports fish value (California halibut [*Paralichthys californicus*] and barred sand bass [*Paralabrax nebulifer*]). Eelgrass beds are critical foraging centers for seabirds (such as the endangered California least tern [*Sternula antillarum brownii*]) that seek out baitfish (i.e., juvenile topsmelt) attracted to the eelgrass cover. Last, eelgrass is an important contributor to the detrital (decaying organic) food web of bays, as the decaying plant material is consumed by many benthic invertebrates (such as polychaete worms) and reduced to primary nutrients by bacteria.

The newly introduced eelgrass beds would be located in the north arm of the Lagoon and in the newly developed open channel, and would be located below the lowest tidal elevation. The eelgrass plants would be hand-planted via scuba diver on the bottom of the Lagoon and channel.

Develop a Bird Island. A bird island to provide a safe refuge for roosting birds will be developed by excavating (approximately 6,600 cy of soils) an area adjacent to the north shoreline in the western arm of the Lagoon. Maintenance requirements are assumed to be minimal, consisting of periodic cleaning, inspection, and repairs as needed.

Recreational Improvements

Construct a Walking Trail around the Lagoon and Open Channel. This component would provide additional public recreation amenities at the Lagoon through improved pedestrian access and learning opportunities. A walking trail would be extended around portions of the perimeter of the Lagoon and the eastern side of proposed open channel, extending through areas that currently provide no public access. As shown on Figure 5, the trail would not extend around the western arm of the Lagoon. A viewing platform will be located at the end of the trail toward the western arm. The trail would connect to the existing footbridge on both the north and south shores of the Lagoon. As mentioned previously, the existing recreation improvements (e.g., barbeques and picnic tables) will remain on the north shore of the Lagoon.

The trail would be generally 8 ft wide, except along the north shore, where the access trail from Sixth Street would be 12 ft wide to provide emergency access along the western shore of the northern arm. The trail would be constructed of decomposed granite in the new areas, which would connect to the existing sidewalk. Interpretive kiosks, seating benches, picnic tables, and shade structures would be installed along the trail. The kiosks would provide educational information about the Lagoon.

Reconfigure Sports Fields in Marina Vista Park. Due to the location of the proposed open channel, the baseball diamond in Marina Vista Park would be moved slightly north. The new location would provide an area large enough to maintain functionality for league sports and provide for a youth soccer field overlay (as currently provided). The adult-sized soccer field would remain in its current location. In summary, the proposed project would reconfigure the existing fields, but continue to provide the same number of fields and the same functionality that is currently provided in the park.

Operational Components

These are operational features that could be implemented without additional CEQA clearance and that complement the water quality strategies described above.

Implement Trash Management Protocols. More frequent and effective trash management would reduce refuse in the water and adjacent areas, especially during summer months, when the Lagoon is utilized most by picnickers. Proposed trash management protocols include ensuring that all trash containers are covered, disallowing trash trucks to drive on the sand areas, providing additional trash containers at key locations, educating Lagoon users on litter control and its effect on the environment, and enforcing littering laws. The use of landscaping as barriers to prevent trash from blowing across the site and into the Lagoon will also be considered.

Implement Bird Management Protocols. The objective of this component is to reduce direct contribution of bird feces (bacteria) into the Lagoon, thereby improving water quality. This component would prohibit the release of domestic birds such as ducks and geese and involve installing signs to discourage people from feeding any birds.

Modify Sand Nourishment Practices. The City imports sand for beach fill at the Lagoon. Beach fill is currently done on the north and south shores of the Lagoon, mostly in the swimming areas. Approximately 60–100 cy of sand is brought in annually, and some of this sand erodes into the Lagoon waters. Hence, there is a concern that this sand is filling the Lagoon, as well as adversely impacting the Lagoon's intertidal habitat. Because of these concerns, this component would modify the existing sand nourishment practices by limiting sand nourishment to only the south shore swimming area to the east of the footbridge. This component would require half of the amount of sand that is currently being imported. Additionally, sand quality would be assessed to optimize grain size so that it remains on the beach longer. Figure 5 shows the proposed sand placement area.

PROJECT PHASING

It is anticipated that phase one would involve the improvements at the Lagoon and phase two would involve improvement within Marina Vista Park. Specifically, the improvements within Marina Vista Park are anticipated to occur at least one year after the Lagoon improvements depending upon the availability of funding. The project components of each phase are listed below.

- Phase 1: Lagoon Improvements
  - Clean the culvert and remove tidal gates, sill, and other structural impedances at the culvert. Implement trash and bird management protocols and modified sand nourishment practices.
  - Dredge the western arm and central Lagoon areas. Recontour the Lagoon side slopes. Develop bird island.
  - Implement storm drain upgrades, including the development of a storm water diversion system and bioswales.
  - Remove the north parking lot and access road, and restroom on the north shore of the Lagoon.
  - Recontour Lagoon side slopes, develop bird island, revegetate land areas, and plant eelgrass.
  - Develop the walking trail and viewing platform at the Lagoon.
- Phase 2: Marina Vista Park Improvements
  - Construct two roadway bridges spanning the open channel at East Colorado Street and East Eliot Street. Demolish and replace two public restrooms. Build the open channel between the Lagoon and Marine Stadium.
  - Develop the walking trail on the eastern side of the open channel and vegetation buffers on both sides of the channel.

SETTING

EXISTING ENVIRONMENTAL SETTING

The project site is located within the non-desert portion of Los Angeles County, which is part of the South Coast Air Basin (SCAB) and is under the jurisdiction of SCAQMD. The air quality assessment for the proposed project includes estimating emissions associated with short-term construction and long-term operation of the proposed project.

A number of air quality modeling tools are available to assess air quality impacts of projects. In addition, certain air districts, such as the SCAQMD, have created guidelines and requirements to conduct air quality analyses. The SCAQMD's current guidelines, CEQA Air Quality Handbook, 1993, were adhered to in the assessment of air quality impacts for the proposed project.

Regional Air Quality

Both the State of California and the federal government have established health-based AAQS. As shown in Table A, these pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with a diameter of 10 microns or less (PM_{10}) and with a diameter of 2.5 microns or less ($PM_{2.5}$), and lead. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

In addition to setting out primary and secondary AAQS, the State of California has established a set of episode criteria for O_3, CO, NO_2, SO_2, and PM_{10}. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three. Table B lists the primary health effects and sources of common air pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety (United States Environmental Protection Agency [EPA]), these health effects will not occur unless the standards are exceeded by a large margin or for a prolonged period of time. State AAQS are more stringent than federal AAQS. Among the pollutants, ozone (O_3) and particulate matter ($PM_{2.5}$ and PM_{10}) are considered regional pollutants, while the others have more localized effects.

The California Clean Air Act (CCAA) provides the SCAQMD with the authority to manage transportation activities at indirect sources. Indirect sources of pollution are generated when minor sources collectively emit a substantial amount of pollution. Examples of this are the motor vehicles at an intersection, a mall, and on highways. The SCAQMD also regulates stationary sources of pollution throughout its jurisdictional area. Direct emissions from motor vehicles are regulated by the California Air Resources Board (ARB).

Table A: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[2,5]	Secondary[2,6]	Method[7]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m³)		0.075 ppm (147 µg/m³)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		–		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	15 µg/m³		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m³)	Non-dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	None	Non-dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m³)		–		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 µg/m³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18 ppm (338 µg/m³)		–		
Lead	30 days average	1.5 µg/m³	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m³	Same as Primary Standard	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m³)	–	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m³)		0.14 ppm (365 µg/m³)	–	
	3-Hour	–		–	0.5 ppm (1300 µg/m³)	
	1-Hour	0.25 ppm (655 µg/m³)		–	–	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07 - 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24-Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride[8]	24-Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

Source: California Air Resources Board (ARB), 4/1/08.

Footnotes:

1 California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, $PM_{2.5}$ and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8 The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

°C = degrees Celsius
$\mu g/m^3$ = micrograms per cubic meter
EPA = United States Environmental Protection Agency
mg/m^3 = milligrams per cubic meter
ppm = parts per million

Table B: Health Effects Summary of Some of the Common Pollutants Found in Air

Pollutant	Health Effects	Examples of Sources
Particulate Matter (PM_{10}: less than or equal to 10 microns)	• Increased respiratory disease • Lung damage • Premature death	• Cars and trucks, especially diesels • Fireplaces, wood stoves • Windblown dust from roadways, agriculture, and construction
Ozone (O_3)	• Breathing difficulties • Lung damage	• Formed by chemical reactions of air pollutants in the presence of sunlight; common sources are motor vehicles, industries, and consumer products
Carbon Monoxide (CO)	• Chest pain in heart patients • Headaches, nausea • Reduced mental alertness • Death at very high levels	• Any source that burns fuel such as cars, trucks, construction and farming equipment, and residential heaters and stoves
Nitrogen Dioxide (NO_2)	• Lung damage	• See carbon monoxide sources
Toxic Air Contaminants	• Cancer • Chronic eye, lung, or skin irritation • Neurological and reproductive disorders	• Cars and trucks, especially diesels • Industrial sources such as chrome platers • Neighborhood businesses such as dry cleaners and service stations • Building materials and products

Source: California Air Resources Board (ARB), 2005.

Climate/Meteorology. Air quality in the planning area is not only affected by various emission sources (mobile, industry, etc.), but is also affected by atmospheric conditions such as wind speed, wind direction, temperature, rainfall, etc. The combination of topography, low mixing height, abundant sunshine, and emissions from the second largest urban area in the United States gives the SCAB the worst air pollution problem in the nation.

Climate in the SCAB is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern border, and high mountains surround the rest of the SCAB. The SCAB lies in the semipermanent high pressure zone of the eastern Pacific; the resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, or Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site is the Long Beach Station.[1] The monthly average maximum temperature recorded at this station from April 1958 to June 2007 ranged from 66.9°F in January to 83.9°F in August, with an annual average maximum of 74.2°F. The monthly average minimum temperature recorded at this station ranged from 45.3°F in December to 64.9°F in August, with an annual average minimum of 54.8°F. January is typically the coldest month, and August is typically the warmest month in this area of the Basin.

Most rainfall in the Basin occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the Basin and along the coastal side of the mountains. The Long Beach climatological station monitored precipitation from April 1958 to June 2007. Average monthly rainfall during that period varied from 2.93 inches in February to 0.39 inch or less between May and October, with an annual total of 11.96 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

Although the SCAB has a semiarid climate, air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants horizontally. The dominant daily wind pattern is an onshore 8 to 12 miles per hour (mph) daytime breeze and an offshore 3 to 5 mph nighttime breeze. The typical wind flow pattern fluctuates only with occasional winter storms or strong northeasterly (Santa Ana) winds from the mountains and deserts northeast of the SCAB. Summer wind flow patterns represent worst case conditions, because this is the period of higher temperatures and more sunlight, which results in ozone formation.

During spring and early summer, pollution produced during any one day is typically blown out of the SCAB through mountain passes or lifted by warm, vertical currents adjacent to mountain slopes. Air contaminants can be transported 60 miles or more from the SCAB by ocean air during the afternoons. From early fall to winter, the transport is less pronounced because of slower average wind speed and the appearance of drainage winds earlier in the day. During stagnant wind conditions, offshore drainage winds may begin by late afternoon. Pollutants remaining in the SCAB are trapped and begin to accumulate during the night and the following morning. A low morning wind speed in pollutant source areas is an important indicator of air stagnation and the potential for buildup of primary air contaminants.

Temperature normally decreases with altitude, and a reversal of this atmospheric state, where temperature increases with altitude, is called an inversion. The height from the earth to the inversion base is known as the mixing height. Persistent low inversions and cool coastal air tend to create morning fog and low stratus clouds. Cloudy days are less likely in the eastern portions of the SCAB and are about 25 percent more likely along the coast. The vertical dispersion of air pollutants in the SCAB is limited by temperature inversions in the atmosphere close to the earth's surface.

Inversions are generally lower in the nighttime when the ground is cool, than during daylight hours when the sun warms the ground and, in turn, the surface air layer. As this heating process continues, the temperature of the surface air layer approaches the temperature of the inversion base, causing heating along its lower edge. If enough warming takes place, the inversion layer becomes weak and

[1] Western Regional Climate Center, www.wrcc.dri.edu.

opens up to allow the surface air layers to mix upward. This can be seen in the middle to late afternoon on a hot summer day when the smog appears to clear up suddenly. Winter inversions typically break earlier in the day, preventing excessive contaminant buildup.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problem is accumulation of carbon monoxide and oxides of nitrogen due to extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen to form photochemical smog.

Global Warming. Global warming is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. The Earth's average near-surface atmospheric temperature rose 0.6 ± 0.2 degrees Celsius (°C) (1.1 ± 0.4°F) in the 20th century. The prevailing scientific opinion on climate change is that "most of the warming observed over the last 50 years is attributable to human activities."[1] The increased amounts of carbon dioxide (CO_2) and other greenhouse gases (GHGs) are the primary causes of the human-induced component of warming. They are released by the burning of fossil fuels, land clearing and agriculture, etc. and lead to an increase in the greenhouse effect.

Greenhouse gases are present in the atmosphere naturally, released by natural sources, or formed from secondary reactions taking place in the atmosphere. They include carbon dioxide, methane, nitrous oxide and ozone. In the last 200 years, mankind has been releasing substantial quantities of greenhouse gases into the atmosphere. These extra emissions are increasing greenhouse gas concentrations in the atmosphere, enhancing the natural greenhouse effect, which is believed to be causing global warming. While man-made greenhouse gases include carbon dioxide, methane and nitrous oxide, some like the chlorofluorocarbons (CFCs) are completely new to the atmosphere.

Natural sources of carbon dioxide include the respiration (breathing) of animals and plants, and evaporation from the oceans. Together, these natural sources release about 150 billion tons of carbon dioxide each year, far outweighing the 7 billion tons of man-made emissions from fossil fuel burning, waste incineration, deforestation and cement manufacture. Nevertheless, natural removal processes, such as photosynthesis by land and ocean-dwelling plant species, cannot keep pace with this extra input of man-made carbon dioxide, and consequently the gas is building up in the atmosphere.

Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Man-made sources include the mining and burning of fossil fuels, digestive processes in ruminant animals such as cattle, rice paddies and the burying of waste in landfills. Total annual emissions of methane are about 500 million tons, with man-made emissions accounting for the majority. As for carbon dioxide, the major removal process

[1] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2001: The Scientific Basis*, http://www.grida.no/climate/ipcc_tar/wg1/index.htm.

of atmospheric methane - chemical breakdown in the atmosphere - cannot keep pace with source emissions, and methane concentrations in the atmosphere are increasing.

Air Pollution Constituents and Attainment Status. The following describes the criteria air pollutants and their attainment status in the SCAB based on ARB's Area Designations, Activities, and Maps (ARB 2006). Table C summarizes the attainment status in the SCAB for the major criteria pollutants.

Table C: Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone: 1 hour	Nonattainment	Revoked June 2005
Ozone: 8 hour	Not Established	Severe-17 Nonattainment
PM_{10}	Nonattainment	Serious Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment/Unclassified
All others	Attainment/Unclassified	Attainment/Unclassified

Source: California Air Resources Board (ARB), 2007, http://www.arb.ca.gov/desig/desig.htm.
CO = carbon monoxide
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size

Ozone. Ozone (smog) is formed by photochemical reactions between oxides of nitrogen and reactive organic gases rather than being directly emitted. Ozone is a pungent, colorless gas typical of Southern California smog. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, the elderly, and young children. Ozone levels peak during summer and early fall. The entire SCAB is designated as a nonattainment area for the State 1-hour ozone standard. The EPA has officially designated the status for the SCAB regarding the 8-hour ozone standard as "Severe-17," which means the SCAB has until 2021 to attain the federal 8-hour ozone standard.

Carbon Monoxide. Carbon monoxide (CO) is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. The entire SCAB is designated as attainment/ maintenance for the federal CO standard and attainment for the State CO standard.

Nitrogen Oxides. Nitrogen dioxide (NO_2), a reddish brown gas, and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as nitrogen oxides, or NO_X. NO_X is a primary component of the photochemical smog reaction. It also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition (i.e., acid rain). NO_2 decreases lung function and may reduce resistance to infection. The entire SCAB is in attainment with both federal and State nitrogen dioxide standards.

Sulfur Dioxide. Sulfur dioxide (SO_2) is a colorless irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight. The entire SCAB is in attainment with both federal and State sulfur dioxide standards.

Lead. Lead is found in old paints and coatings, plumbing, and a variety of other materials. Once in the blood stream, lead can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of lead. The entire SCAB is in attainment for the federal and State standards for lead.

Particulate Matter. Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles (all particles less than or equal to 10 microns in diameter, or PM_{10}) derive from a variety of sources, including windblown dust and grinding operations. Fuel combustion and resultant exhaust from power plants and diesel buses and trucks are primarily responsible for fine particle (less than 2.5 microns in diameter, or $PM_{2.5}$) levels. Fine particles can also be formed in the atmosphere through chemical reactions. Coarse particles (PM_{10}) can accumulate in the respiratory system and aggravate health problems such as asthma. The EPA's scientific review concluded that fine particles ($PM_{2.5}$), which penetrate deeply into the lungs, are more likely than coarse particles to contribute to the health effects listed in a number of recently published community epidemiological studies at concentrations that extend well below those allowed by the current PM_{10} standards. These health effects include premature death and increased hospital admissions and emergency room visits (primarily the elderly and individuals with cardiopulmonary disease); increased respiratory symptoms and disease (children and individuals with cardiopulmonary disease such as asthma); decreased lung functions (particularly in children and individuals with asthma); and alterations in lung tissue and structure and in respiratory tract defense mechanisms. The entire SCAB is a nonattainment area for the federal and State PM_{10} and $PM_{2.5}$ standards.

Reactive Organic Compounds. Reactive organic compounds (ROCs) are formed from combustion of fuels and evaporation of organic solvents. ROCs are not defined criteria pollutants but are a prime component of the photochemical smog reaction. Consequently, ROC accumulates in the atmosphere more quickly during the winter when sunlight is limited and photochemical reactions are slower. Another name for ROCs is VOCs (volatile organic compounds).

LOCAL AIR QUALITY

The SCAQMD, together with the ARB, maintains ambient air quality monitoring stations in the Basin. The air quality monitoring station closest to the site is the Long Beach East Pacific Coast Highway station, and its air quality trends are representative of the ambient air quality in the project area. The pollutants monitored at this station are PM_{10} and $PM_{2.5}$.[1] The closest station that monitors CO, O_3, NO_2, and SO_2 is the North Long Beach station. The ambient air quality data monitored at these two stations within the past 3 years is listed in Table D.

Table D: Ambient Air Quality at the Long Beach Air Monitoring Stations

Pollutant	**Standard**	**2004**	**2005**	**2006**
Carbon Monoxide				
Max 1-hr concentration (ppm)		4.2	4.2	4.2
No. days exceeded: State	> 20 ppm/1-hr	0	0	0
Federal	> 35 ppm/1-hr	0	0	0
Max 8-hr concentration (ppm)		3.4	3.5	3.4
No. days exceeded: State	9.0 ppm/8-hr	0	0	0
Federal	9 ppm/8-hr	0	0	0
Ozone				
Max 1-hr concentration (ppm)		0.090	0.091	0.081
No. days exceeded: State	> 0.09 ppm/1-hr	0	0	0
Max 8-hr concentration (ppm)		0.074	0.069	0.058
No. days exceeded: State	> 0.07 ppm/8-hr	ND[1]	ND	ND
Federal	> 0.08 ppm/8-hr	0	0	0
Particulates (PM_{10})				
Max 24-hr concentration ($\mu g/m^3$)		83	131	117
No. days exceeded: State	> 50 $\mu g/m^3$/24-hr	12	18	19
Federal	> 150 $\mu g/m^3$/24-hr	0	0	0
Annual Arithmetic Average ($\mu g/m^3$)		38.1	43.5	45.0
Exceeded: State	> 20 $\mu g/m^3$ ann. arth. avg.	Yes	Yes	Yes
Particulates ($PM_{2.5}$)				
Max 24-hr concentration ($\mu g/m^3$)		59.7	50.8	53.6
No. days exceeded: Federal	> 65 $\mu g/m^3$/24-hr	0	0	0
Annual Arithmetic Average ($\mu g/m^3$)		16.5	14.7	14.4
Exceeded: State	> 12 $\mu g/m^3$ ann. arth. avg.	Yes	Yes	Yes
Federal	> 15 $\mu g/m^3$ ann. arth. avg.	Yes	No	No
Nitrogen Dioxide				
Max 1-hr concentration (ppm)		0.121	0.136	0.102
No. days exceeded: State	> 0.25 ppm/1-hr	0	0	0
Annual arithmetic average concentration (ppm)		0.028	0.024	0.022
Exceeded: Federal	> 0.053 ppm ann. arth. avg.	No	No	No
Sulfur Dioxide[2]				
Max 24-hr concentration (ppm)		0.013	0.010	0.010
No. days exceeded: State	> 0.04 ppm/24-hr	0	0	0
Federal	> 0.14 ppm/24-hr	0	0	0
Annual arithmetic average concentration (ppm)		0.005	0.002	0.001
Exceeded: Federal	> 0.030 ppm ann. arth. avg.	No	No	No

Sources: EPA and ARB, 2008.
[1] ND: No Data. There was insufficient or no data available to determine the value.
ppm = parts per million
$\mu g/m^3$ = microgram of pollutant per cubic meter of air

[1] Air quality data, 2004–2006; United States Environmental Protection Agency (EPA) and California Air Resources Board (ARB) Web sites.

The ambient air quality data in Table D show that O_3, NO_2, SO_2, and CO levels are below the relevant State and federal standards. The State 24-hour PM_{10} standard was exceeded 12 to 19 times per year in the last 3 years but has not exceeded the federal 24-hour standard. The federal 24-hour $PM_{2.5}$ standard was not exceeded within the past 3 years.

REGULATORY SETTINGS

Federal Regulations/Standards

Pursuant to the federal Clean Air Act (CAA) of 1970, the EPA established national ambient air quality standards (NAAQS). The NAAQS were established for six major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established AAQS, or criteria, for outdoor concentrations in order to protect public health.

Data collected at permanent monitoring stations are used by the EPA to classify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA.

The EPA has designated the Southern California Association of Governments (SCAG) as the Metropolitan Planning Organization (MPO) responsible for ensuring compliance with the requirements of the CAA for the SCAB.

The EPA established new national air quality standards for ground level ozone and fine particulate matter in 1997. On May 14, 1999, the Court of Appeals for the District of Columbia Circuit issued a decision ruling that the CAA, as applied in setting the new public health standards for ozone and particulate matter, was unconstitutional as an improper delegation of legislative authority to the EPA. On February 27, 2001, the U.S. Supreme Court upheld the way the government sets air quality standards under the CAA. The court unanimously rejected industry arguments that the EPA must consider financial cost as well as health benefits in writing standards. The justices also rejected arguments that the EPA took too much lawmaking power from Congress when it set tougher standards for ozone and soot in 1997. Nevertheless, the court threw out the EPA's policy for implementing new ozone rules, saying that the agency ignored a section of the law that restricts its authority to enforce such rules.

In April 2003, the EPA was cleared by the White House Office of Management and Budget (OMB) to implement the 8-hour ground-level ozone standard. The EPA issued the proposed rule implementing the 8-hour ozone standard in April 2003. The EPA completed final 8-hour nonattainment status on April 15, 2004. The EPA revoked the 1-hour ozone standard on June 15, 2005.

The EPA issued the final $PM_{2.5}$ implementation rule in fall 2004 and made final designations on December 15, 2004. The EPA lowered the 24-hour $PM_{2.5}$ standard from 65 to 35 $\mu g/m^3$ and revoked the annual average PM_{10} standard in December 2006.

State Regulations/Standards

The State of California began to set California ambient air quality standards (CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are also listed in Table A.

Originally, there were no attainment deadlines for CAAQS. However, the CCAA of 1988 provided a time frame and a planning structure to promote their attainment. The CCAA required nonattainment areas in the State to prepare attainment plans and proposed to classify each such area on the basis of the submitted plan, as follows: moderate, if CAAQS attainment could not occur before December 31, 1994; serious, if CAAQS attainment could not occur before December 31, 1997; and severe, if CAAQS attainment could not be conclusively demonstrated at all.

The attainment plans are required to achieve a minimum 5 percent annual reduction in the emissions of nonattainment pollutants unless all feasible measures have been implemented. The SCAB is currently classified as a nonattainment area for three criteria pollutants.

REGIONAL AIR QUALITY PLANNING FRAMEWORK

The 1976 Lewis Air Quality Management Act established the SCAQMD and other air districts throughout the State. The federal CAA Amendments of 1977 required that each state adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the state.

The ARB coordinates and oversees both State and federal air pollution control programs in California. The ARB oversees activities of local air quality management agencies and is responsible for incorporating air quality management plans for local air basins into a State Implementation Plan (SIP) for the EPA approval. The ARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by the ARB to classify air basins as “attainment” or “nonattainment” with respect to each pollutant and to monitor progress in attaining air quality standards. The ARB has divided the State into 15 air basins. Significant authority for air quality control within them has been given to local air districts that regulate stationary source emissions and develop local nonattainment plans.

Regional Air Quality Management Plan (AQMP)

The SCAQMD and the SCAG are responsible for formulating and implementing the AQMP for the SCAB. Every 3 years the SCAQMD prepares a new AQMP, updating the previous plan and having a 20-year horizon. The SCAQMD adopted the 2003 AQMP in August 2003 and forwarded it to ARB for review and approval. The ARB approved a modified version of the 2003 AQMP and forwarded it to the EPA in October 2003 for review and approval.

The 2003 AQMP updates the attainment demonstration for the federal standards for O_3 and PM_{10}; replaces the 1997 attainment demonstration for the federal CO standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal NO_2 standard that the SCAB has met since 1992. The 2003 AQMP proposes policies and measures to achieve federal and State standards for healthful air quality in the SCAB.

This revision to the AQMP also addresses several State and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. This AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the ozone SIP for the SCAB for the attainment of the federal ozone air quality standard. However, this revision points to the urgent need for additional emission reductions (beyond those incorporated in the 1997/1999 Plan) to offset increased emission estimates from mobile sources and meet all federal criteria pollutant standards within the time frames allowed under the federal Clean Air Act.

The SCAQMD adopted the 2007 AQMP on June 1, 2007, which it describes as a regional and multiagency effort (i.e., the SCAQMD Governing Board, ARB, SCAG, and EPA). State and federal planning requirements will include developing control strategies, attainment demonstration, reasonable further progress, and maintenance plans. The 2007 AQMP also incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The ARB approved the 2007 AQMP on September 27, 2007, and adopted it as part of the 2007 SIP. The SCAQMD has forwarded the 2007 AQMP to the EPA for its review and approval.

METHODOLOGY

A number of modeling tools are available to assess air quality impacts of projects. In addition, certain air districts, such as the SCAQMD, have created guidelines and requirements to conduct air quality analysis. SCAQMD's current guidelines, CEQA Air Quality Handbook, April, 1993, were adhered to in the assessment of air quality impacts for the proposed project.

The air quality assessment includes estimating emissions associated with short-term construction and long-term operation of the proposed project. Criteria pollutants with regional impacts would be emitted by project related vehicular trips, as well as by emissions associated with stationary sources used on site.

The net increase in pollutant emissions determine the significance and impact on regional air quality as a result of the proposed project. The results also allow the local government to determine whether the proposed project will deter the region from achieving the goal of reducing pollutants in accordance with the AQMP in order to comply with federal and State ambient air quality standards.

SCAQMD has developed localized significance threshold (LST) methodology that can be used to determine whether or not a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standard and are developed based on the ambient concentrations of that pollutant for each source receptor area. SCAQMD's current guidelines, *Final Localized Significance Threshold Methodology* (June 2003), were adhered to in the assessment of air quality impacts for the proposed project.

The LST mass rate look-up tables are used to determine whether the daily emissions for the proposed construction and operational activities could result in significant localized air quality impacts. The emissions of concern from construction activities are NO_X and CO combustion emissions from construction equipment and fugitive PM_{10} dust from construction site preparation activities. The primary emissions from operational activities include but are not limited to NO_X and CO combustion emissions from stationary sources and/or on-site mobile equipment. Off-site mobile emissions from the project are not included in the emissions compared to the LSTs.

THRESHOLDS OF SIGNIFICANCE

A project would normally be considered to have a significant effect on air quality if the project would violate any ambient air quality standards, contribute substantially to an existing air quality violation, expose sensitive receptors to substantial pollutants concentrations, or conflict with adopted environmental plans and goals of the community in which it is located.

In addition to the federal and State AAQS, there are daily and quarterly emissions thresholds for construction and operation of a proposed project in the SCAB. The SCAB is administered by the SCAQMD, and guidelines and emissions thresholds established by the SCAQMD in its *CEQA Air*

Quality Handbook (SCAQMD, April 1993) are used in this analysis. It should be noted that the emission thresholds were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with adequate margin of safety (EPA), these emission thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

Thresholds for Construction Emissions

The following CEQA significance thresholds for construction emissions have been established for the SCAB:

- 75 pounds per day (lbs/day) of reactive organic compounds (ROCs)
- 100 lbs/day of NO_X
- 550 lbs/day of CO
- 150 lbs/day of PM_{10}
- 55 lbs/day of $PM_{2.5}$
- 150 lbs/day of sulfur oxides (SO_X)

Projects in the SCAB with construction related emissions that exceed any of the emission thresholds are considered to be significant under the SCAQMD guidelines.

Thresholds for Operational Emissions

The daily operational emissions "significance" thresholds for the SCAB are as follows.

Emission Thresholds for Pollutants with Regional Effects. Projects with operation related emissions that exceed any of the emission thresholds listed below are considered significant under the SCAQMD guidelines.

- 55 lbs/day of ROCs
- 55 lbs/day of NO_X
- 550 lbs/day of CO
- 150 lbs/day of PM_{10}
- 55 lbs/day of $PM_{2.5}$
- 150 lbs/day of SO_X

Local Microscale Concentration Standards. The significance of localized project impacts under CEQA depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. If ambient levels are below the standards, a project is considered to have a significant impact if project emissions result in an exceedance of one or more of these standards. If ambient levels already exceed a State or federal standard, project emissions are considered significant if they increase 1-hour CO concentrations by 1.0 part per million (ppm) or more or 8-hour CO concentrations by 0.45 ppm or more. The following are applicable local emission concentration standards for carbon monoxide.

- California State 1-hour CO standard of 20.0 ppm
- California State 8-hour CO standard of 9.0 ppm

Thresholds for Localized Significance

For this project, the appropriate Source Receptor Area (SRA) for LST is the South Coastal Los Angeles County Area, according to the SRA/City Table on the SCAQMD LST Web site.[1] The site is larger than 5 ac; however, it is expected that construction operations will not exceed 5 ac in any one day, so the 5 ac thresholds were used. Sensitive land uses within the vicinity of the proposed project site include two beaches, single-family residences, a daycare facility, Marina Vista Park, and a recreational golf course. These sensitive receptors are located within 100 ft of the active construction areas. Based on the SCAQMD LST Guidelines, the following thresholds, derived from the 25- and 50-meter LST thresholds, apply for this project.

Construction thresholds for a 5 ac site:

- 268 lbs/day of NO_X at 100 ft
- 1,269 lbs/day of CO at 100 ft
- 21 lbs/day of PM_{10} at 100 ft
- 9 lbs/day of $PM_{2.5}$ at 100 ft

Operational thresholds for a 5 ac site:

- 268 lbs/day of NO_X at 100 ft
- 1,269 lbs/day of CO at 100 ft
- 5 lbs/day of PM_{10} at 100 ft
- 2 lbs/day of $PM_{2.5}$ at 100 ft

Global Warming

Global warming and greenhouse gases (GHGs) are an emerging environmental concern being raised on statewide, national, and global levels. Regional, State, and federal agencies are developing strategies to control pollutant emissions that contribute to global warming. However, neither CEQA nor the CEQA Guidelines mention or provide any methodology for analysis of "greenhouse gases," including CO_2, nor do they provide any significance thresholds. This air quality analysis follows all procedures and requirements of the State CEQA and the SCAQMD CEQA Handbook. Evaluation of

1 Source: www.aqmd.gov/ceqa/handbook/LST/LST.html.

any potential global warming effects resulting from the project, including modeling and gauging the impacts associated with an increase of trips or generation of new trips and the effect on the greenhouse effect or global warming would be entirely speculative since no modeling protocol or significance criteria has been established.

IMPACTS

Air pollutant emissions associated with the project would occur over the short term from construction activities, such as fugitive dust from site preparation and grading, and emissions from equipment exhaust. Implementation of the proposed project is not expected to alter the long-term operation of the Lagoon. Therefore, no changes to the long-term emissions are anticipated.

CONSTRUCTION IMPACTS

Construction activities produce combustion emissions from various sources such as utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, and motor vehicles transporting the construction crew. Exhaust emissions from construction activities envisioned on site would vary daily as construction activity levels change. The use of construction equipment on site would result in localized exhaust emissions.

Equipment Exhaust and Related Construction Activities

Construction of the Colorado Lagoon Restoration project has been split into two phases. These two phases have been further divided into multiple sub-phases. The maximum daily exhaust emissions generated within each of the construction sub-phases are listed in Table E and detailed in Appendix A. Sub-phase 1b, the sediment removal within the western arm of the Lagoon, has two alternatives. The first alternative is to dewater the Lagoon and remove the dry sediment. The second alternative is to remove the wet sediment using land-based excavation. Dewatering the Lagoon and removing the dry sediment will require additional equipment. Therefore, the emissions from this alternative were calculated and are shown in Table E. In addition, there are two alternatives for disposing of the contaminated dredge material. The first is to haul it to a Class 1 hazardous waste disposal facility near Bakersfield or to an approved Port of Long Beach site. The emissions in Table E assume the longer haul distance required to transport the material to the hazardous waste disposal facility.

Throughout the construction schedule, the various construction sub-phases will overlap. Table F lists the emissions that would be generated within each month of the current construction schedule. Phase Two will not commence until after Phase One has been completed. Table F shows that construction equipment/vehicle emissions would exceed the SCAQMD established daily emissions threshold for NO_X.

Table E: Peak Daily Construction Emissions by Sub-Phase (lb/day)

Sub-Phase	CO	ROCs	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2
1a – Existing Culvert Improvements	30.6	6.0	60.9	8.0	3.6	3.2	4,573.4
1b – Western Arm Sediment Removal	78.6	11.4	**154.5**	5.6	6.4	5.6	15,928.0
1c – Central Area Sediment Removal	19.4	3.0	36.8	5.5	1.8	1.6	3,213.0
1d – Storm Drain Treatments	34.9	6.6	65.7	10.1	4.0	3.5	5,043.0
1e – Bioswales	25.9	4.9	49.1	6.9	3.0	2.7	3,709.0
1f – North Parking Lot, Access Road, and Restroom Demolition	36.7	6.3	76.8	10.2	5.0	3.6	6,239.2
1g – Side Slope Recontouring	37.5	7.2	79.0	12.6	9.4	4.9	5,729.2
1h – Trail and Viewing Platform Construction	26.5	5.0	55.7	7.5	8.1	3.7	4,084.6
2a – Bridge Construction	51.6	10.8	**105.9**	15.5	11.1	6.4	7,547.7
2b – Open Channel Construction	69.9	12.6	**137.0**	14.9	12.4	7.4	11,233.4
2c – Grading, Irrigation, Landscaping	36.7	6.9	77.0	12.4	9.3	4.8	5,667.3

Source: LSA Associates, Inc., May 2008.
[1] No threshold has been established.

CO = carbon monoxide
CO_2 = carbon dioxide
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ROCs = reactive organic compounds
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides

Table F: Peak Daily Construction Emissions (lbs/day)

Month	Sub-Phases	CO	ROCs	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2
Phase 1								
April	1d	34.9	6.6	65.7	10.1	4.0	3.5	5,043.0
May	1d	34.9	6.6	65.7	10.1	4.0	3.5	5,043.0
June	1b, 1d	113.5	18.0	**220.2**	15.7	10.4	9.1	20,971.0
July	1a, 1b	109.2	17.4	**215.4**	13.6	10.0	8.8	20,501.4
August	1a, 1b	109.2	17.4	**215.4**	13.6	10.0	8.8	20,501.4
September	1b, 1c	98.0	14.4	**191.3**	11.1	8.2	7.2	19,141.0
October	1b, 1c, 1e, 1f, 1g	198.1	32.8	**396.2**	40.8	25.6	18.4	34,818.4
November	1c, 1e, 1f, 1g	119.5	21.4	**241.7**	35.2	19.2	12.8	18,890.4
December	1f, 1g	74.2	13.5	**155.8**	22.8	14.4	8.5	11,968.4
January	1g, 1h	64.0	12.2	**134.7**	20.1	17.5	8.6	9,813.8
February	1g	37.5	7.2	79.0	12.6	9.4	4.9	5,729.2
Phase 2								
May	2a	51.6	10.8	**105.9**	15.5	11.1	6.4	7,547.7
June	2a	51.6	10.8	**105.9**	15.5	11.1	6.4	7,547.7
July	2a	51.6	10.8	**105.9**	15.5	11.1	6.4	7,547.7
August	2a	51.6	10.8	**105.9**	15.5	11.1	6.4	7,547.7
September	2a	51.6	10.8	**105.9**	15.5	11.1	6.4	7,547.7
October	2a	51.6	10.8	**105.9**	15.5	11.1	6.4	7,547.7
November	2a, 2b	121.5	23.4	**242.9**	30.4	23.5	13.8	18,781.1
December	2a, 2b	121.5	23.4	**242.9**	30.4	23.5	13.8	18,781.1
January	2a, 2b	121.5	23.4	**242.9**	30.4	23.5	13.8	18,781.1
February	2a, 2b	121.5	23.4	**242.9**	30.4	23.5	13.8	18,781.1
March	2a, 2b	121.5	23.4	**242.9**	30.4	23.5	13.8	18,781.1
April	2a, 2b	121.5	23.4	**242.9**	30.4	23.5	13.8	18,781.1

Table F: Peak Daily Construction Emissions (lbs/day)

Month	Sub-Phases	CO	ROCs	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2
May	2b	69.9	12.6	**137.0**	14.9	12.4	7.4	11,233.4
June	2b, 2c	106.6	19.5	**214.0**	27.3	21.7	12.2	16,900.7
July	2c	36.7	6.9	77.0	12.4	9.3	4.8	5,667.3
SCAQMD Emissions Threshold		**550**	**75**	**100**	**150**	**150**	**55**	**NA[1]**
Exceed Significance?		NO	NO	YES	NO	NO	NO	NA

Source: LSA Associates, Inc., May 2008.
[1] No threshold has been established.
Note: Bold face numbers indicate emissions exceeding SCAQMD emissions threshold.
CO = carbon monoxide
CO_2 = carbon dioxide
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ROCs = reactive organic compounds
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides

Fugitive Dust

Fugitive dust emissions are generally associated with land clearing, exposure, and cut-and-fill operations. Construction of the proposed project improvements largely involves dredging, excavation, and reuse of soil materials. Because groundwater levels at Marine Stadium and the Lagoon are approximately 5 ft below ground, a large portion of the dredge and excavation materials will be wet. As a result, little fugitive dust is expected to be generated by these operations. However, fugitive dust could be generated as construction equipment or trucks travel on and off the construction site and during the parking lot, access road, and restroom demolition. These emissions will be relatively small and are included in Tables E and F.

Odors

Heavy-duty equipment in the project area during construction would emit odors. These odors would be limited to the time that construction equipment is operating during the construction period for the project. Mitigation Measure AQ-2 requires that all construction equipment be maintained in accordance with the manufacturer's specifications. Mitigation Measure AQ-3 requires that all construction equipment be turned off when not in use, and Mitigation Measure AQ-6 requires that on-road construction trucks and other vehicles grater than 10,000 pounds be shut off when not in use. These measures reduce impacts associated with objectionable odors from the operation of diesel-powered construction equipment. However, given the duration of construction activity and the proximity of the sensitive receptors, these impacts may still be considered significant after mitigation.

During the dredging phases of the proposed project, the dredged materials will be spread out on site to dry before being hauled off site. It is anticipated that the dredged sediment will contain organic materials and that the decomposition of the organic matter when exposed to air may generate unpleasant odors. Therefore, the dredged material may result in odor impacts at the adjacent and nearby sensitive land uses. Implementation of Mitigation Measure HAZ-4 in Section 4.6 requires the application of a mixture of Simple Green and water to the excavated sediment as part of an overall Soil Management Plan. Simple Green accelerates the decomposition process and will have the overall result of shortening the duration of odor emissions. However, since it is difficult to predict the nature and duration of odor emissions from decomposition, it is concluded that the odor impacts would remain significant and unavoidable.

On-Road Vehicle Exhaust Emissions

A traffic impact analysis was prepared for the proposed project construction phases by LSA Associates, Inc. (LSA, May 2008). This analysis determined that the peak daily construction trips would include up to 35 haul truck trips and 10 employee commute trips per day. When added to the existing traffic at the local intersections and roadway segments, the proposed project contribution to vehicle exhaust emissions would be minimal.

LONG-TERM PROJECT-RELATED EMISSIONS IMPACTS

Long-term air emission impacts are associated with any change in permanent use of the project site by on-site stationary and off-site mobile sources that substantially increase emissions. Stationary source emissions include emissions associated with electricity consumption and natural gas usage. Mobile source emissions would result from vehicle trips associated with the proposed project. The proposed project would not result in any long-term on-site stationary sources and would have a minimal change in the off-site vehicle trips. Therefore, no emissions were calculated for the proposed project from long-term mobile source or long-term stationary sources. The project's air quality impact would be less than significant because there would be no increase in stationary or mobile source emissions.

CO Hot-Spot Analysis

The primary mobile source pollutant of local concern is CO, which is a direct function of vehicle idling time caused by traffic conditions. CO transport is extremely limited; it disperses rapidly with distance from the source under normal meteorological conditions. Under certain extreme meteorological conditions, CO concentrations proximate to a congested roadway or intersection may reach unhealthy levels affecting local sensitive receptors (residents, schoolchildren, the elderly, hospital patients, etc.). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient CO concentrations, modeling of CO concentrations is recommended in determining a project's effect on local CO levels. Because the proposed project would have a minimal change in off-site vehicle trips, no significant CO contributions would occur in the project vicinity. Therefore, no CO "hot spots" are expected, and modeling of CO emissions is not necessary.

LOCALIZED SIGNIFICANCE

The following analysis was performed per SCAQMD *Final Localized Significance Threshold Methodology* (June 2003). The nearest sensitive receptors, such as the on-site daycare facility, the north and south beaches, and the existing residences, are located within 100 ft of the active construction areas. Table G shows the construction-related emissions of NO_X, CO, PM_{10}, and $PM_{2.5}$ (see Appendix A) compared to the LSTs for the South Coastal Los Angeles County Area.

Table G: Summary of Construction Emissions Localized Significance

Phase	CO	NO_X	PM_{10}	$PM_{2.5}$
1a – Existing Culvert Improvements	22.2	49.3	3.2	2.9
1b – Western Arm Sediment Removal	16.2	35.6	2.2	1.9
1c – Central Area Sediment Removal	11.0	25.2	1.4	1.3
1d – Storm Drain Treatments	26.4	54.1	3.6	3.2
1e – Bioswales	17.5	37.5	2.6	2.3
1f – North Parking Lot, Access Road, and Restroom Demolition	22.6	54.0	4.2	2.9
1g – Side Slope Recontouring	29.0	67.4	9.0	4.5
1h – Trail and Viewing Platform Construction	18.1	44.1	7.7	3.3
2a – Bridge Construction	41.7	94.1	10.7	6.0
2b – Open Channel Construction	43.0	96.9	10.9	6.2
2c – Grading, Irrigation, Landscaping	28.3	65.4	8.9	4.4
Localized Significance Threshold (at 100 ft)	**1,269**	**268**	**21**	**9**
Exceed Significance?	**NO**	**NO**	**NO**	**NO**

Source: LSA Associates, Inc., May 2008.

CO = carbon monoxide
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size

Table G shows that the calculated emissions rates for the proposed construction activities would not exceed the localized significance thresholds. Therefore, the proposed construction activities would not result in short-term, localized, significant air quality impacts.

AIR QUALITY MANAGEMENT PLAN CONSISTENCY

An AQMP describes air pollution control strategies to be taken by a city, county, or region classified as a nonattainment area. The main purpose of an AQMP is to bring the area into compliance with federal and State air quality standards. CEQA requires that certain proposed projects be analyzed for consistency with the AQMP. For a project to be consistent with the AQMP adopted by the SCAQMD, the pollutants emitted from the project should not exceed the SCAQMD daily threshold or cause a significant impact on air quality, or the project must already have been included in the AQMP projection. However, if feasible mitigation measures are implemented and shown to reduce the impact level from significant to less than significant, a project may be deemed consistent with the AQMP. The AQMP uses the assumptions and projections of local planning agencies to determine control strategies for regional compliance status. Since the AQMP is based on local General Plans, projects that are deemed consistent with the General Plan are found to be consistent with the AQMP. The proposed project would not result in any population growth and is consistent with the City's General Plan. In addition, the proposed project is not expected to result in any increase in long-term regional air quality emissions. Therefore, the project will not conflict with the AQMP, and no significant impact will result with respect to implementation of the AQMP.

AIR QUALITY CUMULATIVE IMPACTS

Construction of the project would contribute cumulatively to the local and regional air pollutants, together with other projects under construction. The project would result in significant construction related air quality impacts. Thus, it is anticipated that these additional emissions would result in significant cumulative air quality impacts.

Greenhouse Gas Emissions

The project will generate emissions of GHGs, primarily in the form of vehicle exhaust during construction. As shown in Table F, the construction activities will generate up to 34,818 pounds of CO_2 per day. There are no federal, State, or local emissions thresholds established for GHGs such as CO_2. As a comparison, the entire State generated approximately 2.2 billion (2,197,992,329) lbs/day of CO_2 in 2004.

The allowable emissions from on-road and off-road vehicle and equipment exhaust are controlled by the State and federal government agencies and are outside the control of this project. The proposed project would not result in any long-term on-site stationary sources and would have little to no change in the off-site vehicle trips. Therefore, the proposed project would not generate any additional long-term GHG emissions.

GHG emissions are considered for their potential to contribute to Global Climate Change. The proposed project will result in short-term emissions associated with the use of construction equipment. There will be no ongoing increase in contribution to global warming because there are no on-site stationary sources, and there is essentially no increase in the number of vehicular trips coming to and from the project site. Therefore, the proposed project's contribution to Global Climate Change in the form of GHG emissions is less than significant.

STANDARD CONDITIONS

The project must comply with the following standard conditions. Therefore, implementation of these measures was included in the analysis above.

Construction Emissions

The project is required to comply with regional rules that assist in reducing short-term air pollutant emissions. SCAQMD Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rule 402 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site. Applicable dust suppression techniques from Rule 403 are summarized below. Implementation of these dust suppression techniques can reduce the fugitive dust generation (and thus the PM_{10} component). Compliance with these rules would reduce impacts on nearby sensitive receptors.

Applicable Rule 403 measures:

- Water active sites at least twice daily. (Locations where equipment operations are to occur will be thoroughly watered prior to use.)
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered, or should maintain at least 2 feet of freeboard in accordance with the requirements of California Vehicle Code (CVC) Section 23114 (freeboard means vertical space between the top of the load and top of the trailer).
- Traffic speeds on all unpaved areas shall be reduced to 15 mph or less.
- Use low-sulfur fuel for stationary construction equipment. This is required by SCAQMD Rules 431.1 and 431.2.

MITIGATION MEASURES

Short-term Impacts

A. The following additional dust suppression measures in the SCAQMD *CEQA Air Quality Handbook* are included to further reduce the likelihood of air quality impacts:

- Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour (mph).
- Sweep all streets once per day if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water).
- Install wheel washers, or steel plate rumble strips, where vehicles enter and exit unpaved roads onto paved roads, or wash trucks and any equipment leaving the site.
- Pave, water, or chemically stabilize all on-site roads as soon as feasible.
- Minimize at all times the area disturbed by clearing, grading, earthmoving, or excavation operations.
- All trucks hauling dirt, sand, soil, or other loose materials are to be tarped with a fabric cover and maintain a freeboard height of 12 inches.
- Limit on-site vehicle speeds (on unpaved roads) to 15 mph.

B. The Construction Contractor shall select the construction equipment used on site based on low-emission factors and high energy efficiency. The Construction Contractor shall ensure that construction grading plans include a statement that all construction equipment will be tuned and maintained in accordance with the manufacturer's specifications.

C. The Construction Contractor shall ensure that construction equipment is shut off when not in use and idle for more than five minutes.

D. The Construction Contractor shall time the construction activities so as to not interfere with peak-hour traffic and minimize obstruction of through traffic lanes adjacent to the site; if necessary, a flagperson shall be retained to maintain safety adjacent to existing roadways.

E. The Construction Contractor shall support and encourage ridesharing and transit incentives for the construction crew.

F. The Construction Contractor shall ensure that on-road construction trucks and other vehicles greater than 10,000 pounds shall be shut off when not in use and shall not idle for more than 5 minutes

G. On-site sensitive land uses, such as the on-site preschool and the beaches, shall be closed or relocated when construction activities occur within 250 feet.

H. Dredged material that will be dried on-site shall be located as far as feasible from the residential, school, and daycare land uses within the project area.

Long-term Impacts

There are no significant long-term air quality impacts.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project would have significant unavoidable short-term construction air quality impacts (odors and NO_X [a precursor to O_3] emissions) after the implementation of all feasible mitigation measures. The project would also contribute to adverse cumulative air quality impacts because the Basin is presently in nonattainment for O_3, and the project, in conjunction with other planned projects, would contribute to the existing nonattainment status.

REFERENCES

California Air Resources Board Web site: http://www.arb.ca.gov.

South Coast Air Quality Management District. Air Quality Management Plan, 2007.

South Coast Air Quality Management District. *CEQA Air Quality Handbook*, 1993.

South Coast Air Quality Management District. *Final Localized Significance Threshold Methodology*, June 2003.

South Coast Air Quality Management District. *Final Methodology to Calculate Particulate Matter (PM) 2.5 and $PM_{2.5}$ Significance Thresholds*, October 2006.

Western Regional Climate Center Web site: http://www.wrcc.dri.edu.

APPENDIX A

CONSTRUCTION EMISSIONS

Colorado Lagoon

TOTAL CONSTRUCTION EMISSIONS

Source [1]	Parameter 1	Parameter 2	CO Emission Factor	CO Emission (lbs/day)	ROC Emission Factor	ROC Emission (lbs/day)	NOx Emission Factor	NOx Emission (lbs/day)	SOx Emission Factor	SOx Emission (lbs/day)	PM10 Emission Factor	PM10 Emission (lbs/day)	PM2.5 Emission Factor	PM2.5 Emission (lbs/day)	CO2 Emission Factor	CO2 Emission (lbs/day)
Phase 1a: Existing Culver Improvements																
Small Loader	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Excavator	8 hours/day	1 unit	0.469 lb/hr	3.8	0.086 lb/hr	0.7	1.029 lb/hr	8.2	0.243 lb/hr	1.9	0.055 lb/hr	0.4	0.049 lb/hr	0.4	72.280 lb/hr	578.2
Loader	8 hours/day	2 unit	0.421 lb/hr	6.7	0.090 lb/hr	1.4	1.022 lb/hr	16.4	0.221 lb/hr	3.5	0.059 lb/hr	0.9	0.053 lb/hr	0.8	63.810 lb/hr	1,021.0
Small Crane	8 hours/day	1 unit	0.350 lb/hr	2.8	0.080 lb/hr	0.6	0.941 lb/hr	7.5	0.196 lb/hr	1.6	0.049 lb/hr	0.4	0.044 lb/hr	0.3	44.720 lb/hr	357.8
Pumps	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Generator	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
<TOTAL>				30.6		6.0		60.9		8.0		3.6		3.2		4,573.4

Phase 1b: Western Arm Sediment Removal

Excavator	8 hours/day	1 unit	0.469 lb/hr	3.8	0.086 lb/hr	0.7	1.029 lb/hr	8.2	0.243 lb/hr	1.9	0.055 lb/hr	0.4	0.049 lb/hr	0.4	72.280 lb/hr	578.2
Loader	8 hours/day	2 unit	0.421 lb/hr	6.7	0.090 lb/hr	1.4	1.022 lb/hr	16.4	0.221 lb/hr	3.5	0.059 lb/hr	0.9	0.053 lb/hr	0.8	63.810 lb/hr	1,021.0
Pumps	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Generator	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Heavy Duty Trucks	270 miles	15 trips per day	6.733 gr/VMT	60.1	0.867 gr/VMT	7.7	13.366 gr/VMT	119.3	0.014 gr/VMT	0.1	0.481 gr/VMT	4.3	0.416 gr/VMT	3.7	####### gr/VMT	13,393.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
<TOTAL>				78.6		11.4		154.5		5.6		6.4		5.6		15,928.0

Phase 1c: Central Area Sediment Removal																	
Excavator	8 hours/day	1 unit	0.469 lb/hr	3.8	0.086 lb/hr	0.7	1.029 lb/hr	8.2	0.243 lb/hr	1.9	0.055 lb/hr	0.4	0.049 lb/hr	0.4	72.280 lb/hr	578.2
Loader	8 hours/day	2 unit	0.421 lb/hr	6.7	0.090 lb/hr	1.4	1.022 lb/hr	16.4	0.221 lb/hr	3.5	0.059 lb/hr	0.9	0.053 lb/hr	0.8	63.810 lb/hr	1,021.0
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
<TOTAL>				19.4		3.0		36.8		5.5		1.8		1.6		3,213.0

Phase 1d: Storm Drain Treatments																
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Excavator	8 hours/day	1 unit	0.469 lb/hr	3.8	0.086 lb/hr	0.7	1.029 lb/hr	8.2	0.243 lb/hr	1.9	0.055 lb/hr	0.4	0.049 lb/hr	0.4	72.280 lb/hr	578.2
Grader	8 hours/day	1 unit	0.540 lb/hr	4.3	0.112 lb/hr	0.9	1.331 lb/hr	10.6	0.276 lb/hr	2.2	0.069 lb/hr	0.6	0.061 lb/hr	0.5	85.010 lb/hr	680.1
Small Crane	8 hours/day	1 unit	0.350 lb/hr	2.8	0.080 lb/hr	0.6	0.941 lb/hr	7.5	0.196 lb/hr	1.6	0.049 lb/hr	0.4	0.044 lb/hr	0.3	44.720 lb/hr	357.8
Trenching Machine	8 hours/day	1 unit	0.357 lb/hr	2.9	0.071 lb/hr	0.6	0.556 lb/hr	4.4	0.127 lb/hr	1.0	0.045 lb/hr	0.4	0.040 lb/hr	0.3	48.290 lb/hr	386.3
Roller	8 hours/day	1 unit	0.360 lb/hr	2.9	0.068 lb/hr	0.5	0.648 lb/hr	5.2	0.139 lb/hr	1.1	0.046 lb/hr	0.4	0.041 lb/hr	0.3	41.220 lb/hr	329.8
Paver	8 hours/day	1 unit	0.429 lb/hr	3.4	0.086 lb/hr	0.7	0.745 lb/hr	6.0	0.165 lb/hr	1.3	0.053 lb/hr	0.4	0.047 lb/hr	0.4	52.050 lb/hr	416.4
Pumps	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
<TOTAL>				34.9		6.6		65.7		10.1		4.0		3.5		5,043.0

Phase 1e: Bio Swales																		
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Excavator	8 hours/day	1 unit	0.469 lb/hr	3.8	0.086 lb/hr	0.7	1.029 lb/hr	8.2	0.243 lb/hr	1.9	0.055 lb/hr	0.4	0.049 lb/hr	0.4	72.280 lb/hr	578.2
Loader	8 hours/day	1 unit	0.421 lb/hr	3.4	0.090 lb/hr	0.7	1.022 lb/hr	8.2	0.221 lb/hr	1.8	0.059 lb/hr	0.5	0.053 lb/hr	0.4	63.810 lb/hr	510.5
Asphalt Cutter	8 hours/day	1 unit	0.408 lb/hr	3.3	0.104 lb/hr	0.8	0.885 lb/hr	7.1	0.144 lb/hr	1.2	0.065 lb/hr	0.5	0.058 lb/hr	0.5	40.490 lb/hr	323.9
Pipe Cutter	8 hours/day	1 unit	0.408 lb/hr	3.3	0.104 lb/hr	0.8	0.885 lb/hr	7.1	0.144 lb/hr	1.2	0.065 lb/hr	0.5	0.058 lb/hr	0.5	40.490 lb/hr	323.9
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
<TOTAL>				25.9		4.9		49.1		6.9		3.0		2.7		3,709.0

Phase 1f: Parking Lot, Access Road, and Restroom																
Bulldozer	8 hours/day	1 unit	0.952 lb/hr	7.6	0.204 lb/hr	1.6	2.728 lb/hr	21.8	0.452 lb/hr	3.6	0.108 lb/hr	0.9	0.096 lb/hr	0.8	159.590 lb/hr	1,276.7
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Excavator	8 hours/day	2 unit	0.469 lb/hr	7.5	0.086 lb/hr	1.4	1.029 lb/hr	16.5	0.243 lb/hr	3.9	0.055 lb/hr	0.9	0.049 lb/hr	0.8	72.280 lb/hr	1,156.5
Loader	8 hours/day	1 unit	0.421 lb/hr	3.4	0.090 lb/hr	0.7	1.022 lb/hr	8.2	0.221 lb/hr	1.8	0.059 lb/hr	0.5	0.053 lb/hr	0.4	63.810 lb/hr	510.5
Heavy Duty Trucks	40 miles	20 trips per day	6.733 gr/VMT	11.9	0.867 gr/VMT	1.5	13.366 gr/VMT	23.6	0.014 gr/VMT	0.0	0.481 gr/VMT	0.8	0.416 gr/VMT	0.7	####### gr/VMT	2,645.7
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
Fugitive Dust												1.3		0.3		0.3
<TOTAL>				36.7		6.3		76.8		10.2		5.0		3.6		6,239.2

Phase 1g: Side Slope Recontouring																
Bulldozer	8 hours/day	1 unit	0.952 lb/hr	7.6	0.204 lb/hr	1.6	2.728 lb/hr	21.8	0.452 lb/hr	3.6	0.108 lb/hr	0.9	0.096 lb/hr	0.8	159.590 lb/hr	1,276.7
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Excavator	8 hours/day	1 unit	0.469 lb/hr	3.8	0.086 lb/hr	0.7	1.029 lb/hr	8.2	0.243 lb/hr	1.9	0.055 lb/hr	0.4	0.049 lb/hr	0.4	72.280 lb/hr	578.2
Loader	8 hours/day	1 unit	0.421 lb/hr	3.4	0.090 lb/hr	0.7	1.022 lb/hr	8.2	0.221 lb/hr	1.8	0.059 lb/hr	0.5	0.053 lb/hr	0.4	63.810 lb/hr	510.5
Grader	8 hours/day	1 unit	0.540 lb/hr	4.3	0.112 lb/hr	0.9	1.331 lb/hr	10.6	0.276 lb/hr	2.2	0.069 lb/hr	0.6	0.061 lb/hr	0.5	85.010 lb/hr	680.1
Trenching Machine	8 hours/day	1 unit	0.357 lb/hr	2.9	0.071 lb/hr	0.6	0.556 lb/hr	4.4	0.127 lb/hr	1.0	0.045 lb/hr	0.4	0.040 lb/hr	0.3	48.290 lb/hr	386.3
Asphalt Cutter	8 hours/day	1 unit	0.408 lb/hr	3.3	0.104 lb/hr	0.8	0.885 lb/hr	7.1	0.144 lb/hr	1.2	0.065 lb/hr	0.5	0.058 lb/hr	0.5	40.490 lb/hr	323.9
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
Fugitive Dust												5.1		1.1		1.1
<TOTAL>				37.5		7.2		79.0		12.6		9.4		4.9		5,729.2

Phase 1h: Trail and Viewing Platform Construction																
Bulldozer	8 hours/day	1 unit	0.952 lb/hr	7.6	0.204 lb/hr	1.6	2.728 lb/hr	21.8	0.452 lb/hr	3.6	0.108 lb/hr	0.9	0.096 lb/hr	0.8	159.590 lb/hr	1,276.7
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Loader	8 hours/day	1 unit	0.421 lb/hr	3.4	0.090 lb/hr	0.7	1.022 lb/hr	8.2	0.221 lb/hr	1.8	0.059 lb/hr	0.5	0.053 lb/hr	0.4	63.810 lb/hr	510.5
Pipe Cutter	8 hours/day	1 unit	0.408 lb/hr	3.3	0.104 lb/hr	0.8	0.885 lb/hr	7.1	0.144 lb/hr	1.2	0.065 lb/hr	0.5	0.058 lb/hr	0.5	40.490 lb/hr	323.9
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
Fugitive Dust												5.1		1.1		1.1
<TOTAL>				26.5		5.0		55.7		7.5		8.1		3.7		4,084.6

Phase 2a: Bridge Construction

Bulldozer	8 hours/day	1 unit	0.952 lb/hr	7.6	0.204 lb/hr	1.6	2.728 lb/hr	21.8	0.452 lb/hr	3.6	0.108 lb/hr	0.9	0.096 lb/hr	0.8	159.590 lb/hr	1,276.7
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Loader	8 hours/day	1 unit	0.421 lb/hr	3.4	0.090 lb/hr	0.7	1.022 lb/hr	8.2	0.221 lb/hr	1.8	0.059 lb/hr	0.5	0.053 lb/hr	0.4	63.810 lb/hr	510.5
Large Crane	8 hours/day	1 unit	0.637 lb/hr	5.1	0.188 lb/hr	1.5	1.695 lb/hr	13.6	0.353 lb/hr	2.8	0.076 lb/hr	0.6	0.067 lb/hr	0.5	96.320 lb/hr	770.6
Trenching Machine	8 hours/day	1 unit	0.357 lb/hr	2.9	0.071 lb/hr	0.6	0.556 lb/hr	4.4	0.127 lb/hr	1.0	0.045 lb/hr	0.4	0.040 lb/hr	0.3	48.290 lb/hr	386.3
Asphalt Cutter	8 hours/day	1 unit	0.408 lb/hr	3.3	0.104 lb/hr	0.8	0.885 lb/hr	7.1	0.144 lb/hr	1.2	0.065 lb/hr	0.5	0.058 lb/hr	0.5	40.490 lb/hr	323.9
Roller	8 hours/day	1 unit	0.360 lb/hr	2.9	0.068 lb/hr	0.5	0.648 lb/hr	5.2	0.139 lb/hr	1.1	0.046 lb/hr	0.4	0.041 lb/hr	0.3	41.220 lb/hr	329.8
Pile Driver	8 hours/day	1 unit	0.534 lb/hr	4.3	0.115 lb/hr	0.9	1.336 lb/hr	10.7	0.223 lb/hr	1.8	0.063 lb/hr	0.5	0.056 lb/hr	0.4	96.320 lb/hr	770.6
Pumps	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Generator	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Paver	8 hours/day	1 unit	0.429 lb/hr	3.4	0.086 lb/hr	0.7	0.745 lb/hr	6.0	0.165 lb/hr	1.3	0.053 lb/hr	0.4	0.047 lb/hr	0.4	52.050 lb/hr	416.4
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	15 trips per day	3.430 gr/VMT	4.5	0.150 gr/VMT	0.2	0.420 gr/VMT	0.6	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	436.5
Fugitive Dust												5.1		1.1		1.1
<TOTAL>				51.6		10.8		105.9		15.5		11.1		6.4		7,547.7

Phase 2b: Open Channel Construction

Bulldozer	8 hours/day	1 unit	0.952 lb/hr	7.6	0.204 lb/hr	1.6	2.728 lb/hr	21.8	0.452 lb/hr	3.6	0.108 lb/hr	0.9	0.096 lb/hr	0.8	159.590 lb/hr	1,276.7
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Excavator	8 hours/day	2 unit	0.469 lb/hr	7.5	0.086 lb/hr	1.4	1.029 lb/hr	16.5	0.243 lb/hr	3.9	0.055 lb/hr	0.9	0.049 lb/hr	0.8	72.280 lb/hr	1,156.5
Loader	8 hours/day	2 unit	0.421 lb/hr	6.7	0.090 lb/hr	1.4	1.022 lb/hr	16.4	0.221 lb/hr	3.5	0.059 lb/hr	0.9	0.053 lb/hr	0.8	63.810 lb/hr	1,021.0
Small Crane	8 hours/day	1 unit	0.350 lb/hr	2.8	0.080 lb/hr	0.6	0.941 lb/hr	7.5	0.196 lb/hr	1.6	0.049 lb/hr	0.4	0.044 lb/hr	0.3	44.720 lb/hr	357.8
Pumps	8 hours/day	3 unit	0.315 lb/hr	7.6	0.090 lb/hr	2.2	0.635 lb/hr	15.2	0.001 lb/hr	0.0	0.047 lb/hr	1.1	0.042 lb/hr	1.0	40.250 lb/hr	966.0
Generator	8 hours/day	1 unit	0.315 lb/hr	2.5	0.090 lb/hr	0.7	0.635 lb/hr	5.1	0.001 lb/hr	0.0	0.047 lb/hr	0.4	0.042 lb/hr	0.3	40.250 lb/hr	322.0
Paver	8 hours/day	1 unit	0.429 lb/hr	3.4	0.086 lb/hr	0.7	0.745 lb/hr	6.0	0.165 lb/hr	1.3	0.053 lb/hr	0.4	0.047 lb/hr	0.4	52.050 lb/hr	416.4
Heavy Duty Trucks	40 miles	35 trips per day	6.733 gr/VMT	20.8	0.867 gr/VMT	2.7	13.366 gr/VMT	41.3	0.014 gr/VMT	0.0	0.481 gr/VMT	1.5	0.416 gr/VMT	1.3	####### gr/VMT	4,630.0
Worker Commute (Light Duty Auto)	40 miles	25 trips per day	3.430 gr/VMT	7.6	0.150 gr/VMT	0.3	0.420 gr/VMT	0.9	0.003 gr/VMT	0.0	0.032 gr/VMT	0.1	0.017 gr/VMT	0.0	330.290 gr/VMT	727.5
Fugitive Dust												5.1		1.1		1.1
<TOTAL>				69.9		12.6		137.0		14.9		12.4		7.4		11,233.4

Phase 2c: Grading, Irrigation, Landscaping																
Bulldozer	8 hours/day	1 unit	0.952 lb/hr	7.6	0.204 lb/hr	1.6	2.728 lb/hr	21.8	0.452 lb/hr	3.6	0.108 lb/hr	0.9	0.096 lb/hr	0.8	159.590 lb/hr	1,276.7
Backhoe	8 hours/day	1 unit	0.420 lb/hr	3.4	0.122 lb/hr	1.0	0.799 lb/hr	6.4	0.115 lb/hr	0.9	0.083 lb/hr	0.7	0.074 lb/hr	0.6	44.820 lb/hr	358.6
Grader	8 hours/day	1 unit	0.540 lb/hr	4.3	0.112 lb/hr	0.9	1.331 lb/hr	10.6	0.276 lb/hr	2.2	0.069 lb/hr	0.6	0.061 lb/hr	0.5	85.010 lb/hr	680.1
Loader	8 hours/day	2 unit	0.421 lb/hr	6.7	0.090 lb/hr	1.4	1.022 lb/hr	16.4	0.221 lb/hr	3.5	0.059 lb/hr	0.9	0.053 lb/hr	0.8	63.810 lb/hr	1,021.0
Trenching Machine	8 hours/day	1 unit	0.357 lb/hr	2.9	0.071 lb/hr	0.6	0.556 lb/hr	4.4	0.127 lb/hr	1.0	0.045 lb/hr	0.4	0.040 lb/hr	0.3	48.290 lb/hr	386.3
Roller	8 hours/day	1 unit	0.360 lb/hr	2.9	0.068 lb/hr	0.5	0.648 lb/hr	5.2	0.139 lb/hr	1.1	0.046 lb/hr	0.4	0.041 lb/hr	0.3	41.220 lb/hr	329.8
Heavy Duty Trucks	40 miles	10 trips per day	6.733 gr/VMT	5.9	0.867 gr/VMT	0.8	13.366 gr/VMT	11.8	0.014 gr/VMT	0.0	0.481 gr/VMT	0.4	0.416 gr/VMT	0.4	####### gr/VMT	1,322.8
Worker Commute (Light Duty Auto)	40 miles	10 trips per day	3.430 gr/VMT	3.0	0.150 gr/VMT	0.1	0.420 gr/VMT	0.4	0.003 gr/VMT	0.0	0.032 gr/VMT	0.0	0.017 gr/VMT	0.0	330.290 gr/VMT	291.0
Fugitive Dust												5.1		1.1		1.1
<TOTAL>				36.7		6.9		77.0		12.4		9.3		4.8		5,667.3

APPENDIX D

JURISDICTIONAL DELINEATION REPORT

JURISDICTIONAL DELINEATION REPORT

COLORADO LAGOON IMPROVEMENT PROJECT

CITY OF LONG BEACH, LOS ANGELES COUNTY, CALIFORNIA

LSA

February 2008

TABLE OF CONTENTS

FIGURES

TABLE

APPENDICES

INTRODUCTION

This report presents the results of a delineation by LSA Associates, Inc. (LSA) of potential wetlands and waters subject to the jurisdiction of the United States and the State of California within the project area for the proposed Colorado Lagoon Improvement project (project) in the City of Long Beach (City), Los Angeles County (County), California (Figure 1). This report addresses the requirements of the federal Clean Water Act (CWA), the California Fish and Game Code, and the California Coastal Act. This report has been prepared for use by the United States Army Corps of Engineers (ACOE), the California Department of Fish and Game (CDFG), and the California Coastal Commission (CCC) as part of their review of applications for permit authorization.

This routine wetland and jurisdictional delineation was conducted under contract to the City. The findings and conclusions presented in this report, including the location and extent of wetlands and other waters subject to regulatory jurisdiction, represent the professional opinion of LSA and should be considered preliminary until verified by representatives of the ACOE, CDFG, and CCC.

PROPOSED PROJECT

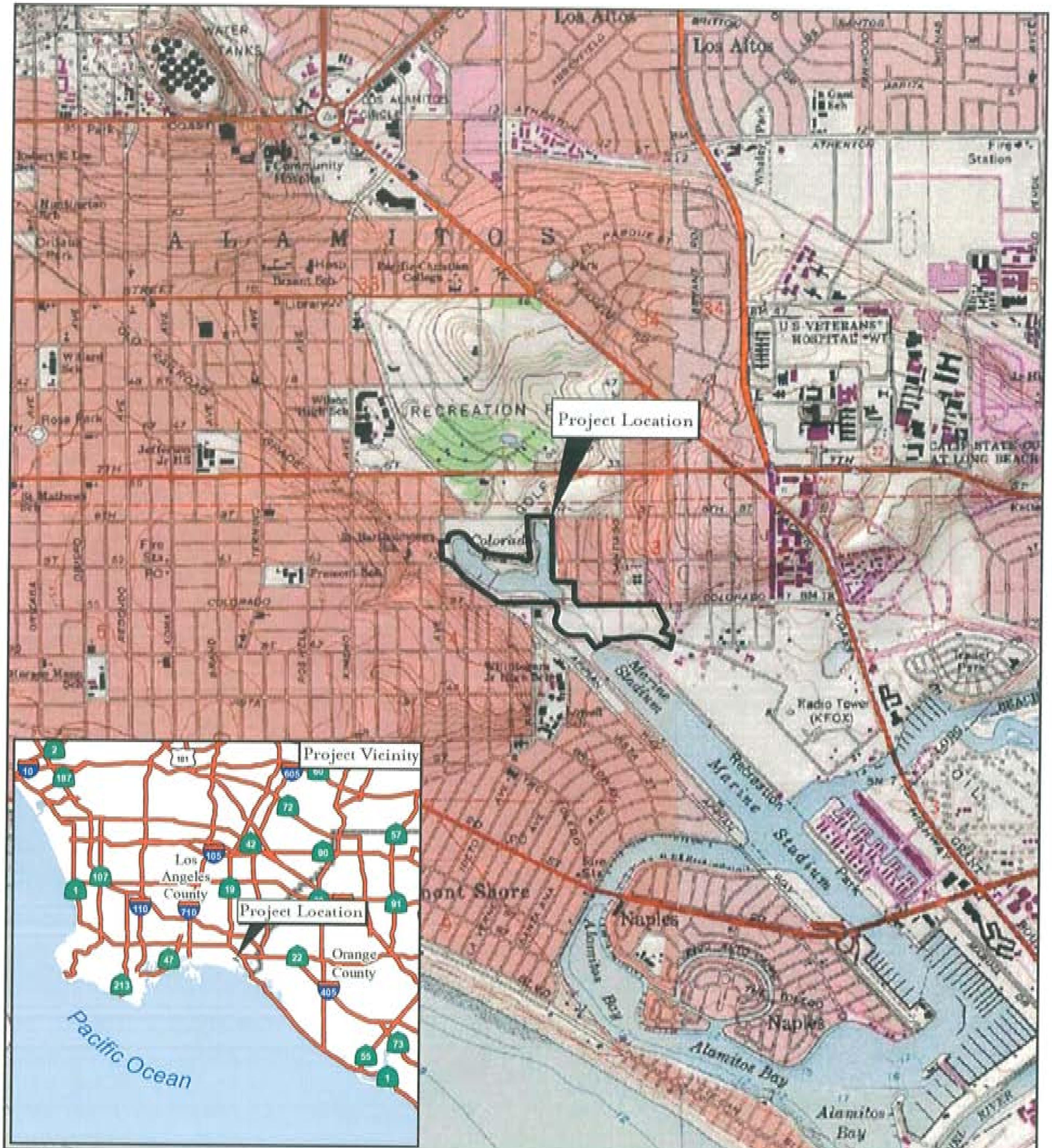
The City proposes to restore and remediate Colorado Lagoon in order to provide recreational and water quality benefits, intertidal and upland habitat, and enhanced educational opportunities. Currently, the Lagoon suffers from degraded water quality, poor intertidal circulation, and heavy metals and toxin-contaminated sediment deposited over many years. In the past, bacterial concentrations within the Lagoon have caused the area to be regularly closed to public access. The purpose of the project is to improve the water quality and to restore the Lagoon's beneficial uses.

The City proposes to recontour the lagoon to (1) increase intertidal zones, (2) reduce the bank slopes and increase the salt marsh habitat, (3) restore coastal salt marsh and transitional upland habitat, and (4) daylight and increase the size and depth of the culvert between Marine Stadium and the Colorado Lagoon that is within Marina Vista Park.

SITE DESCRIPTION

The project area consists of an approximately 42-acre (ac) site in southeast Long Beach. The facility is owned and operated by the City of Long Beach Department of Parks, Recreation, and Marine. Existing improvements include the Lagoon, a wetland and marine science education center, picnic area, and playground. The entire project area is bounded by East 6th Street and a City-owned golf course to the north, East Appian Way and Eliot Street to the south, Park Avenue to the west, and Monrovia Avenue to the east. The site is located at latitude 33.7710°N, longitude 118.1334°W, primarily in section 4 of Township 5 South, and Range 12 West, on the United States Geological Survey (USGS) *Long Beach, California* 7.5-minute series topographical quadrangle. Land uses adjacent to the project area are predominantly residential and recreation.

All of the project area is developed or disturbed land. However, there are several habitat types located within the project area, including ornamental vegetation, developed areas, bare ground, ruderal vegetation, salt marsh, and open water (Figure 2).



LSA

FIGURE 1

LEGEND

Project Boundary

N

0 1,000 2,000 Feet

Colorado Lagoon Restoration Project

Project Location Map

SOURCE: USGS 7.5' QUAD - Long Beach ('81); CALIF.

I:\elb0702\GIS\FIGURE_1.mxd (12/5/2007)

LSA

FIGURE 2

LEGEND

Bare Ground
Open Water
Ruderal
Developed
Ornamental Vegetation
Salt Marsh

0 87.5 175 Feet

SOURCE: AirPhoto USA (2006)

I:\CLB0702\GIS\VEG_.mxd (2/1/2008)

Colorado Lagoon
Habitat Types

The entire study area is located within the San Gabriel River Watershed. The watershed is bordered by the San Gabriel Mountains to the north, San Bernardino/Orange County to the east, the Los Angeles River to the west, and the Pacific Ocean to the south. The watershed is composed of approximately 640 square miles of land spanning over 37 cities. The average annual rainfall for the project area is 12.94 inches. However, the fieldwork for this delineation was completed following an abnormally dry rainy season and prior to any significant rain events for the 2007/2008 rainy season. In the 2006/2007 rainy season, the City received a cumulative total of only 1.99 inches of rainfall.[1]

REGULATORY BACKGROUND

United States Army Corps of Engineers

The ACOE regulates discharges of dredged or fill material into waters of the United States. These waters include wetland and nonwetland bodies of water that meet specific criteria. ACOE regulatory jurisdiction, pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 United States Code [U.S.C.] 403), regulates almost all work in, over, and under waters listed as "navigable waters of the U.S." ACOE regulatory jurisdiction, pursuant to Section 404 of the CWA, is founded on a connection, or nexus, between the water body in question and interstate commerce. This connection may be direct, through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce, or indirect, through a nexus identified in the ACOE regulations. The following definition of waters of the United States is taken from the discussion provided at 33 Code of Federal Regulations (CFR) 328.3:

> "The term waters of the United States means:
>
> (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce . . . ;
>
> (2) All interstate waters including interstate wetlands;
>
> (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams) . . . the use, degradation or destruction of which could affect interstate or foreign commerce . . . ;
>
> (4) All impoundments of waters otherwise defined as waters of the United States under the definition; and
>
> (5) Tributaries of waters defined in paragraphs (a) (1)–(4) of this section."

The ACOE typically considers jurisdiction as waters of the United States with respect to bodies of water displaying an ordinary high water mark (OHWM). ACOE jurisdiction over nontidal waters of the United States extends laterally to the OHWM or beyond the OHWM to the limit of any adjacent wetlands, if present (33 CFR 328.4). The OHWM is defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the

1 http://www.ipm.ucdavis.edu/calludt.cgi/WXSTATIONDATA.html, September 13, 2007.

surrounding area." (33 CFR 328.3) Jurisdiction typically extends upstream to the point where the OHWM is no longer perceptible. Under Section 404, ACOE jurisdiction over tidal waters of the United States shoreward extends to the line on the shore reached by the highest high water.

Under Section 10, ACOE jurisdiction over tidal waters of the United States extends from the ordinary low tide 3 nautical miles seaward. ACOE jurisdiction shoreward extends to the line on the shore reached by the mean high water. This jurisdiction extends to this edge even though portions of the water body may be extremely shallow and are thus considered "navigable in law" although they may not be navigable in fact (33 CFR 329.12).

As discussed above, ACOE regulatory jurisdiction under Section 404 of the CWA is founded on a connection between the water body in question and interstate commerce. This connection may be direct, through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce, or indirect, through a nexus identified in the ACOE regulations. In the past, an indirect nexus could potentially be established if isolated waters provided habitat for migratory birds, even in the absence of a surface connection to a navigable water of the United States. The 1984 rule that enabled the ACOE to expand jurisdiction over isolated waters of this type became known as the Migratory Bird Rule. However, on January 9, 2001, the United States Supreme Court narrowly limited the ACOE jurisdiction of "nonnavigable, isolated, intrastate" waters based solely on the use of such waters by migratory birds, and particularly, the use of indirect indicators of interstate commerce (e.g., use by migratory birds that cross state lines) as a basis for jurisdiction. The court's ruling derives from the case Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, No. 99-1178 (SWANCC). The Supreme Court determined that the ACOE exceeded its statutory authority by asserting CWA jurisdiction over an abandoned sand and gravel pit in northern Illinois that provides habitat for migratory birds.

In 2006, the United States Supreme Court further considered the ACOE jurisdiction of "waters of the United States" in the consolidated cases Rapanos v. United States and Carabell v. United States (126 S. Ct. 2208), collectively referred to as Rapanos. The Supreme Court concluded that wetlands are "waters of the United States" if they significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as navigable. On June 5, 2007, the ACOE issued guidance regarding the Rapanos decision. This guidance states that the ACOE will continue to assert jurisdiction over traditional navigable waters, wetlands adjacent to traditional navigable waters, relatively permanent nonnavigable tributaries that have a continuous flow at least seasonally (typically three months), and wetlands that directly abut relatively permanent tributaries. The ACOE will determine jurisdiction over waters that are nonnavigable tributaries that are not relatively permanent and wetlands adjacent to nonnavigable tributaries that are not relatively permanent only after making a significant nexus finding.

Furthermore, the preamble to ACOE regulations (Preamble Section 328.3, Definitions) states that the ACOE does not generally consider the following waters to be waters of the United States. The ACOE does, however, reserve the right to regulate these waters on a case-by-case basis.

- Nontidal drainage and irrigation ditches excavated on dry land
- Artificially irrigated areas that would revert to upland if the irrigation ceased

- Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing
- Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons
- Water-filled depressions created in dry land incidental to construction activity and pits excavated in dry land for purposes of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States

Waters found to be isolated and not subject to ACOE regulation are often still regulated by the Regional Water Quality Control Board (RWQCB) under the State Porter-Cologne Water Quality Control Act (Porter-Cologne Act).

Wetlands

Wetland delineations for Section 404 purposes must be conducted according to the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Regional Supplement) (ACOE 2006) and the Corps of Engineers 1987 Wetland Delineation Manual (1987 Manual) (Environmental Laboratory 1987). Where there are differences between the two documents, the Regional Supplement takes precedence over the 1987 Manual.

The ACOE and Environmental Protection Agency (EPA) define wetlands as follows:

> "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions."

In order to be considered a jurisdictional wetland under Section 404, an area must possess three wetland characteristics: hydrophytic vegetation, hydric soils, and wetland hydrology. Each characteristic has a specific set of mandatory wetland criteria that must be satisfied in order for that particular wetland characteristic to be met. Several parameters (indicators) may be analyzed to determine whether the criteria are satisfied.

Hydrophytic vegetation and hydric soils indicators provide evidence that episodes of inundation have lasted more than a few days or have occurred repeatedly over a period of years, but do not confirm that an episode has occurred recently. Conversely, wetland hydrology provides evidence that an episode of inundation or soil saturation occurred recently, but does not provide evidence that episodes lasted more than a few days or occurred repeatedly over a period of years. Because of this, if an area lacks one of the three characteristics under normal circumstances, the area is considered nonwetland under most circumstances.

Determination of wetland limits may be obfuscated by a variety of natural environmental factors or human activities, collectively called difficult wetland situations, including cyclic periods of drought and flooding or highly ephemeral stream systems. During periods of drought, for example, bank return flows are reduced and water tables are lowered. This results in a corresponding lowering of ordinary high water and invasion of upland plant species into wetland areas. Conversely, extreme flooding may create physical evidence of high water well above what might be considered ordinary and may allow the temporary invasion of hydrophytic species into nonwetland areas. In highly ephemeral systems typical of Southern California, these problems are encountered frequently. In these situations, professional judgment based on years of practical experience and extensive knowledge of local ecological conditions comes into play in delineating wetlands. The Regional Supplement provides additional guidance for difficult wetland situations.

Hydrophytic Vegetation. Hydrophytic vegetation is plant life that grows and is typically adapted for life in permanently or periodically saturated soils. Hydrophytic indicator species are those included on the *National List of Plant Species That Occur in Wetlands: California (Region 0)* (Reed 1988), published by the United States Fish and Wildlife Service (USFWS). Each species on the list is rated according to a wetland indicator category, as shown in Table A.

Table A: Hydrophytic Vegetation

Category		Probability
Obligate Wetland	OBL	Almost always occur in wetlands (estimated probability > 99 percent)
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability 67–99 percent)
Facultative	FAC	Equally likely to occur in wetlands and nonwetlands (estimated probability 34–66 percent)
Facultative Upland	FACU	Usually occur in nonwetlands (estimated probability 67–99 percent)
Obligate Upland	UPL	Almost always occur in nonwetlands (estimated probability > 99 percent)

To be considered hydrophytic, the species must have wetland indicator status (i.e., be rated as obligate [OBL], facultative wetland [FACW], or facultative [FAC]).

The delineation of hydrophytic vegetation is typically based on the most dominant species from each vegetative stratum (strata are considered separately); when more than 50 percent of these dominant species are hydrophytic (i.e., FAC, FACW, or OBL), the vegetation is considered hydrophytic. In particular, the ACOE recommends the use of the "50/20" rule (also known as the dominance test) from the Regional Supplement for determining dominant species. Under this method, dominant species are the most abundant species that immediately exceed 50 percent of the total dominance measure for the stratum, plus any additional species comprising 20 percent or more of the total dominance measure for the stratum. In cases where indicators of hydric soil and wetland hydrology are present but the vegetation initially fails the dominance test, the prevalence index must be used. The prevalence index is a weighted average of all plant species within a sampling point. The prevalence index is particularly useful when communities only have one or two dominants, where species are present at roughly equal coverage, or when strata differ greatly in total plant cover.
In addition, ACOE guidance provides that morphological adaptations may be considered when determining hydrophytic vegetation when indicators of hydric soil and wetland hydrology are present

(ACOE 2006). If the plant community passes either the dominance test or prevalence index after reconsidering the indicator status of any plant species that exhibit morphological adaptations for life in wetlands, the vegetation is considered hydrophytic.

Hydric Soils.[1] Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.[2] Soils are considered likely to meet the definition of a hydric soil when one or more of the following criteria are met:

1. All Histels except Folistels and Histosols except Folists; or
2. Soils that are frequently ponded for long duration or very long duration[3] during the growing season; or
3. Soils that are frequently flooded for long duration or very long duration during the growing season.

Hydric soils develop under conditions of saturation and inundation combined with microbial activity in the soil that causes a depletion of oxygen. While saturation may occur at any time of year, microbial activity is limited to the growing season, when soil temperature is above biologic zero (the soil temperature at a depth of 50 centimeters [cm], below which the growth and function of locally adapted plants are negligible). Biogeochemical processes that occur under anaerobic conditions during the growing season result in the distinctive morphologic characteristics of hydric soils.

The Regional Supplement has a number of field indicators that may be used to identify hydric soils. The Natural Resources Conservation Service (NRCS) (2003) has also developed a number of field indicators that may demonstrate the presence of hydric soils. These indicators include hydrogen sulfide generation; accumulation of organic matter; and reduction, translocation, and/or accumulation of iron and other reducible elements. These processes result in soil characteristics that persist during both wet and dry periods. Separate indicators have been developed for sandy soils and for loamy and clayey soils.

Wetland Hydrology. Under natural conditions, development of hydrophytic vegetation and hydric soils are dependent on a third characteristic: wetland hydrology. Areas with wetland hydrology are those where the presence of water has an overriding influence on vegetation and soil characteristics due to anaerobic and reducing conditions, respectively (Environmental Laboratory 1987). The wetland hydrology parameter is satisfied if the area is seasonally inundated or saturated to the surface for a minimum of 14 consecutive days during the growing season in most years (ACOE 2006).

---

[1] The hydric soil definition and criteria included in the 1987 Manual are obsolete. Users of the Manual are directed to the United States Department of Agriculture (USDA) Natural Resources Conservation Service Web site for the most current information on hydric soils.

[2] Current definition as of 1994 (Federal Register [FR] July 13, 1994).

[3] Long duration is defined as a single event ranging from 7 to 30 days; very long duration is defined as a single event that lasts longer than 30 days.

Hydrology is often the most difficult criterion to measure in the field due to seasonal and annual variations in water availability. Some of the indicators that are commonly used to identify wetland hydrology include visual observation of inundation or saturation, watermarks, recent sediment deposits, surface scour, and oxidized root channels (rhizospheres) resulting from prolonged anaerobic conditions.

California Department of Fish and Game

The CDFG, through provisions of the California Fish and Game Code (Section 1600 et seq.), is empowered to issue agreements for any alteration of a river, stream, or lake where fish or wildlife resources may be adversely affected. Streams (and rivers) are defined by the presence of a channel bed and banks and at least an intermittent flow of water. The CDFG regulates wetland areas only to the extent that those wetlands are part of a river, stream, or lake as defined by the CDFG.

In obtaining CDFG agreements, the limits of wetlands are not typically determined. The reason for this is that CDFG generally includes, within the jurisdictional limits of streams and lakes, any riparian habitat present. Riparian habitat includes willows, mulefat, and other vegetation typically associated with the banks of a stream or lake shorelines. In most situations, wetlands associated with a stream or lake would fall within the limits of riparian habitat. Thus, defining the limits of CDFG jurisdiction based on riparian habitat will automatically include any wetland areas and may include additional areas that do not meet ACOE criteria for soils and/or hydrology (e.g., where riparian woodland canopy extends beyond the banks of a stream away from frequently saturated soils).

California Coastal Commission

The CCC, through provisions of the California Coastal Act, is empowered to issue a Coastal Development Permit (CDP) for many projects located within the Coastal Zone. In areas where a local entity has a certified Local Coastal Program (LCP), the local entity (e.g., City of Long Beach) can issue a CDP only if it is consistent with the LCP. The CCC, however, has appeal authority for portions of LCPs and retains jurisdiction over certain public trust lands and in areas without an LCP.

The CCC's definition of wetlands, as defined in Section 30121 of the Coastal Act and Title 14 §13577 of the CCC's regulations, is distinctly different from the ACOE definition of wetlands. According to the CCC's regulations, wetlands are defined as "land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes." Both definitions focus on three fundamental wetland characteristics: hydrology, soils, and vegetation. However, while the ACOE definition requires the existence of all three wetland characteristics for an area to be considered a wetland, the CCC's definition of wetlands is based on the existence of only two characteristics: wetland hydrology sufficient to either support a prevalence of hydrophytic vegetation or promote the formation of hydric soils. (Exceptions include certain areas that lack wetland soils and vegetation.) It is noted that, under certain circumstances, reliable indicators of all required characteristics are not necessarily apparent, and areas may be delineated as wetlands by the ACOE on the basis of indicators of only two of the three characteristics. The CCC routinely makes jurisdictional wetlands determinations based on the presence of one characteristic indicator (i.e., wetland soils or vegetation) under the assumption that wetland hydrology must be present in order for the indicator to be present. Nevertheless, the presence of wetland hydrology during some portion of most years is fundamental to the existence of any wetland, and the CCC will sometimes disregard vegetation or soil indicators when there is sufficient evidence to conclusively refute the presence of wetland hydrology.

METHODOLOGY

The fieldwork for this evaluation was conducted by LSA biologists Jim Harrison and Elizabeth Delk on December 5, 2007. A follow-up visit was conducted by LSA biologists Elizabeth Delk and Matt Teutimez on February 4, 2008. Field maps of the area to be surveyed were prepared using a 2006 aerial photograph base at a scale of 1 inch = 100 feet (ft). The project area was surveyed on foot, and all areas of potential jurisdiction were evaluated according to ACOE, CDFG, and CCC criteria. Data were recorded directly on the field maps.

Areas supporting hydrology or species of plant life potentially indicative of wetlands were evaluated according to routine wetland delineation procedures described in the Regional Supplement. Representative sample points were selected and examined in the field in those areas where wetland jurisdiction was in question or needed to be confirmed. Figure 3 shows the locations of the sample points and the potential jurisdictional areas identified. At each sample point, the dominant and subdominant plant species were identified and their wetland indicator status (Reed 1988) noted. A small sample pit (approximately 20 inches deep) was dug at each point in order to examine soil characteristics and composition. Soil matrix colors were classified according to the Munsell Soil Color Charts (Munsell Color 2000). Hydrological conditions, including any surface inundation, saturated soils, groundwater levels, and/or other wetland hydrology indicators, were recorded. General site characteristics were also noted. Standard data forms were completed for each sample point; copies of these data forms are included in Appendix A of this report.

RESULTS

ACOE Section 10 Jurisdiction

The study area is located approximately 900 ft northwest of Alamitos Bay, which is an extension of the Pacific Ocean (a navigable water of the U.S.). Colorado Lagoon is tidally influenced through a direct connection to Alamitos Bay via a large box culvert (approximately 20 ft wide). Thus the project is subject to ACOE jurisdiction to the mean high water line under Section 10 of the Rivers and Harbors Act.

ACOE Section 404 Jurisdiction

Because of the direct connection with Alamitos Bay, Colorado Lagoon is subject to ACOE jurisdiction at least to the high tide line under Section 404 of the Clean Water Act (Figure 3). The beaches of the lagoon show evidence of an OHWM by the presence of shelving, watermarks, sediment deposits, and drainage patterns. Nonetheless, because tidal fluctuation varies throughout the year, limits of ACOE Section 404 jurisdiction were extended beyond the observed OHWM to the limits of the highest high water mark where wetland vegetation and soils were lacking. In addition, several areas satisfy all three criteria for ACOE jurisdictional wetlands and are discussed further below. Please refer to the attached wetland data form (Appendix A) for a full description of the sample point results.

LSA

FIGURE 3

LEGEND

CCC Jurisdiction

ACOE Jurisdiction

Non-Wetland Waters

Wetland Waters

Mean High Water (2.1 amsl)

Soil Pit

0 87.5 175 Feet

SOURCE: EagleAerial (2006).

I:\CLB0702\GIS\JD_.mxd (2/13/2008)

Colorado Lagoon

Potential Jurisdiction

Vegetation. There is a variety of vegetation communities located within the project area, including ornamental vegetation, ruderal vegetation, developed areas, and coastal salt marsh. Some ruderal forbs and annual nonnative grasses occur throughout most of these communities. The hydrophytic vegetation criterion for ACOE jurisdictional wetlands is satisfied when there is a prevalence of wetland vegetation. Areas identified in the field as wetlands are primarily disturbed wetland habitats, dominated by wetland vegetation, but still subject to Section 404 jurisdiction. The predominant wetland vegetation associated with Colorado Lagoon includes saltgrass (*Distichlis spicata*, FACW), common woody pickleweed (*Salicornia virginica*, OBL), bush seepweed (*Suaeda moquinii*, FAC), shoregrass (*Monanthochloe littoralis*, OBL), salt marsh sand spurry (*Spergularia marina*, OBL), and fleshy jaumea (*Jaumea carnosa*, OBL).

Soils. Sample plots were taken within the project area above the observed high tide line where wetland vegetation was predominant to identify the limits of potential jurisdictional areas. The locations of the sample plots are depicted on Figure 3. Soil pit (SP) 1 consisted of permeable soils predominantly made up of sand, sandy loam, and sandy clay loam. This sample plot failed to meet any hydric soils indicators outlined in the Regional Supplement. However, there was a gley layer (Munsel moist 10BG 4/2) starting at a depth of approximately 6 inches that was approximately 2 inches wide. Although this layer did not satisfy the correct combination of hue, value, and chroma as defined by the Regional Supplement, the marked difference between this layer and the rest of the soil profile is evidence of hydric soils. In addition, because sandy soils are highly permeable and the lagoon is subject to regular tidal fluctuations, other indicators of hydric soils (i.e., iron masses) may be stripped from the soil profile. Therefore, it is believed that the soils at Colorado Lagoon are naturally problematic but nevertheless hydric. SP2 failed to meet any hydric soils indicators outlined in the Regional Supplement and did not show any other evidence of hydric soils.

Additional soil pits were dug (Figure 3), but no data were collected when it was deemed soil conditions were similar to SP1 and SP2. Similar to SP2, none of these additional soil pits showed a prevalence of wetland vegetation. However, unlike SP2, these additional soil pits showed an evidence of hydrology, as described below.

Hydrology. Wetland hydrology within the project area was evident around the entire lagoon, primarily by the presence of water marks and sediment deposits. In addition, aquatic invertebrate shell remains were observed in SP1 at approximately 6 inches (just above the gley layer). Therefore, SP1 met the wetland hydrology criterion. In addition, saturation was observed within SP1 during low tide at a depth of approximately 16 inches below the surface. Because of the high permeability of the soils, it is likely that saturation would be closer to the surface during high tide. In addition, a soil pit dug approximately 3 ft closer to the water line (at the time of the survey) had standing water at approximately 6 inches.

Pursuant to Section 10 of the Rivers and Harbors Act, the ACOE will assert jurisdiction over tidal areas up to the mean high tide line. LSA biologists did not delineate the mean high tide line in the field. This limit is certainly within the limits of Section 404 jurisdiction as delineated here. Consequently, the Section 10 jurisdiction for this project exists within the Section 404 jurisdictional limits.

CONCLUSIONS

ACOE Jurisdiction

Each of the areas shown in Figure 3 has a direct connection to a designated navigable water of the U.S. Therefore, ACOE will verify that a "significant nexus determination" is not required. Under ACOE guidance, agencies will assert jurisdiction over navigable waters and their adjacent wetlands, where adjacent is defined as "bordering, contiguous, or neighboring." Therefore, finding a surface connection is not required to determine adjacency under this definition.

There is a total of 17.68 ac of waters potentially subject to ACOE jurisdiction, of which 0.94 ac is wetland waters and 16.74 ac are nonwetland waters of the U.S.

CDFG Jurisdiction

None of the areas identified within the project site are rivers, lakes, streams, or their associated riparian habitat. All potential wetlands on the site are associated with a coastal salt marsh system. Salt marshes are typically not regulated under the Fish and Game Code. Thus, there are no potential CDFG jurisdictional areas within the project site.

CCC Jurisdiction

All of the areas satisfying the ACOE jurisdictional criteria for waters and wetlands of the United States, as described above, are also subject to CCC jurisdiction as wetlands pursuant to the California Coastal Act. See Figure 3 for the extent of CCC wetland jurisdiction. There is a total of 17.76 ac potentially subject to CCC wetland jurisdiction. Because CCC employs a one-parameter approach to delineating jurisdictional wetlands, CCC wetlands usually tend to be more inclusive and extensive. LSA biologists delineated potential CCC jurisdictional wetlands using this one-parameter approach. Because tidal fluctuation varies throughout the year, CCC jurisdiction was extended to the limits of the highest high water mark where wetland vegetation and soils were lacking. In addition, CCC wetland jurisdiction was mapped where wetland vegetation extended beyond the limit of the highest high water mark. There were no hydric soils that extended beyond the limit of the highest high water.

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APPENDIX A

COPIES OF WETLAND DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Colorado Lagoon City/County: Long Beach Sampling Date: 12/5/07

Applicant/Owner: City of Long Beach State: ______ Sampling Point: SP1

Investigator(s): J. Harrison & L. Delk Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): C Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No X (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil X, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ______
Hydric Soil Present?	Yes X	No ______
Wetland Hydrology Present?	Yes X	No ______

Is the Sampled Area within a Wetland? Yes X No ______

Remarks:
2006/2007 was an abnormally dry year. Site visit was prior to significant rain event for 2007/2008 season.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Distichlis spicata	40	Y	FACW
2. Suaeda moquinii	2	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	42		
Woody Vine Stratum			
1. N/A			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 58 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	40	x 2 = 80
FAC species	2	x 3 = 6
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	42 (A)	86 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ______

Remarks:

SOIL

Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
1-6	2.5y 4/2	100					Sand	some organics
6-8	10BG 2.5/1	100					sandy loam	some organics
8-24	10YR 4/6	90					sand	
8-24	" "	10					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

Soil is Ramona-Placentia association, which is not on the National hydric soil list. Although don't meet any indicator defined by the Arid West Supplement there is evidence of hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3) must be w/in 12 inches
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ______
Water Table Present?	Yes ___	No X	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 16-18

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Found shell remains in soil at ~6 in.

Standing water at 6 in in pit 3 ft closer to the water.

Saturated at 16 in, but during low tide. If pit was dug during high tide, it's likely saturation would have been higher.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Colorado Lagoon City/County: Long Beach Sampling Date: 2/4/08

Applicant/Owner: City of Long Beach State: CA Sampling Point: SP2

Investigator(s): L. Delk & M Teutimez Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): C Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation X, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No X

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No X	Is the Sampled Area within a Wetland?	Yes ______ No X
Hydric Soil Present?	Yes ______ No X		
Wetland Hydrology Present?	Yes ______ No X		

Remarks: Sandy beach regularly disturbed by grading.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1. N/A			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ______ No X

Remarks: No vegetation. Sandy beach regularly disturbed by grading.

SOIL

Sampling Point: SP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	5Y 5/2	95						
4-24+	2.5Y 4/3	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes ______ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ______

Water Table Present? Yes ______ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): 24

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

PHOTO LOG, PHOTO LOCATION MAP, AND SITE PHOTOGRAPHS

PHOTO LOG

Photo Number	View	Description
1	Northeast	View of transition between salt marsh habitat, dominated by saltgrass, and bare ground.
2	Southeast	Storm water and nuisance runoff from the northern parking lot enters Colorado Lagoon.
3	Northeast	Transition between salt marsh habitat, dominated by pickleweed and bush seepweed, and open water.
4	North	View of scouring at high tide demonstrating evidence of OHWM.
5	West	There are several storm water inlets into Colorado Lagoon.
6	Northwest	View of algal mat along banks.
7	East	View of bank showing bare ground (algal mat) along the shore, salt marsh vegetation along the bank, and ornamental vegetation beyond the bank.
8	East	View of water marks on concrete box culvert demonstrating evidence of OHWM.
9	Southeast	View of sandy beach on south side of Colorado Lagoon
10	Northwest	View of salt marsh along south side of Colorado Lagoon dominated by shoregrass.
11	Northeast	View of picnic area, restrooms, and golf course across Colorado Lagoon.
12	Northeast	Debris and sediments have been deposited along the shore line during high tide.
13	West	View of barnacles and water marks on bridge columns demonstrating evidence of high tide.
14	South	View of western bank of the north arm.
15	North	View of western bank of the north arm.
16	North	View of eastern bank of the north arm.
17	South	Debris has been deposited at high tide line on box culvert demonstrating evidence of OHWM.
18	North	View of storm drain box culvert on eastern side of the north arm of Colorado Lagoon.
19	Southeast	View along shore line of the eastern bank of the north arm.
20	South	View of box culvert connecting Colorado Lagoon to Alamitos Bay.
21	South	View of box culvert connecting Colorado Lagoon to Alamitos Bay.
22	West	View of shell fragments along shore near connection to Alamitos Bay.
23	West	Overview of west arm.
24	North	View of SP1.

LSA

FIGURE B-1

LEGEND

Photo Location

0 87.5 175 Feet

SOURCE: AirPhoto USA (02/06)

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Colorado Lagoon

Photo Locations

1.

2.

3.

4.

LSA

FIGURE B-2

Colorado Lagoon

Site Photos


5.


6.


7.


8.

LSA

FIGURE B-3

Colorado Lagoon
Site Photos


9.


10.


11.


12.

LSA

FIGURE B-4

Colorado Lagoon
Site Photos

13.

14.

15.

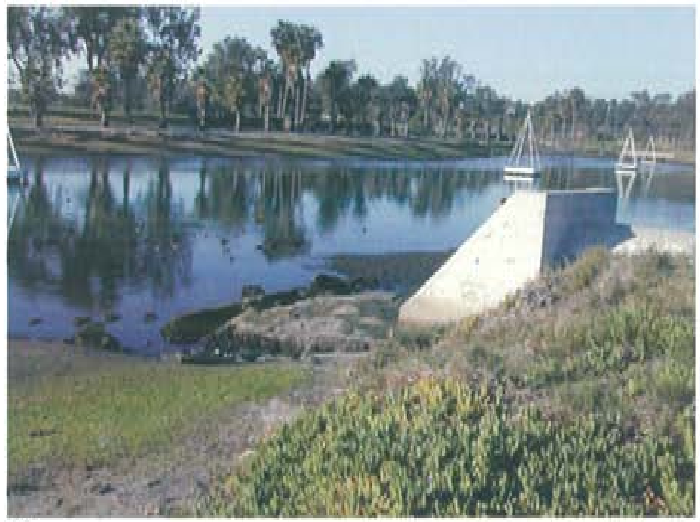
16.

LSA

FIGURE B-5

Colorado Lagoon
Site Photos


17.


18.


19.


20.

LSA

FIGURE B-6

Colorado Lagoon
Site Photos

21.

22.

23.

24.

LSA

FIGURE B-7

Colorado Lagoon

Site Photos

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