FINAL

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION/ ENVIRONMENTAL ASSESSMENT

River Avenue Storm Drain Improvements Project

LEAD AGENCY:

City of Long Beach
333 West Ocean Boulevard
Long Beach, California 90802
Contact: Mr. Mark Christoffels
562.570.6771

PREPARED BY:

RBF Consulting
14725 Alton Parkway
Irvine, California 92618
Contact: ***Mr. Glenn Lajoie, AICP***
949.472.3505

September 8, 2009

JN 10-106837

TABLE OF CONTENTS

IS/MND/EA AND APPENDICES ON CD

PART I
CEQA INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

FINAL

PART I

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION

River Avenue Storm Drain Improvements Project

LEAD AGENCY:

City of Long Beach
333 West Ocean Boulevard
Long Beach, California 90802
Contact: Mr. Mark Christoffels
562.570.6771

PREPARED BY:

RBF Consulting
14725 Alton Parkway
Irvine, California 92618
Contact: ***Mr. Glenn Lajoie, AICP***
949.472.3505

September 8, 2009

JN 10-106837

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONTINUED)

APPENDICES

LIST OF TABLES

LIST OF EXHIBITS

1.0 INTRODUCTION

The proposed River Avenue Storm Drain Improvements Project (herein referenced as the "project") is located within the City of Long Beach (City) and involves improvements to the River Avenue storm drain system. The project generally extends from the intersection of Wardlow Road and River Avenue to the Southern California Edison (SCE) easement, located south of Arlington Street.

Following a preliminary review of the proposed project, the City of Long Beach determined that the improvements are subject to the guidelines and regulations of the California Environmental Quality Act (CEQA). The City has determined an Initial Study/Mitigated Negative Declaration (IS/MND) to be the appropriate level of environmental analysis under the provisions of CEQA. As the City is seeking project funding from the U.S. Department of Housing and Urban Development (HUD), the proposed project is also subject to environmental review under the National Environmental Policy Act (NEPA). Enclosed as Part 2 of this document is the Environmental Assessment (EA), which was prepared in compliance with the guidelines and regulations of NEPA.

1.1 STATUTORY AUTHORITY AND REQUIREMENTS

California Environmental Quality Act

In accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000-21177) and pursuant to Section 15063 of Title 14 of the California Code of Regulations (CCR), the City of Long Beach, acting in the capacity of Lead Agency, is required to undertake the preparation of an Initial Study to determine whether the proposed project would have a significant environmental impact. If the Lead Agency finds that there is no evidence that the project, either as proposed or as modified to include the mitigation measures identified in the Initial Study, may cause a significant effect on the environment, the Lead Agency shall find that the proposed project would not have a significant effect on the environment and shall prepare a Negative Declaration (or Mitigated Negative Declaration) for that project. Such determination can be made only if "there is no substantial evidence in light of the whole record before the Lead Agency" that such impacts may occur (Section 21080(c), Public Resources Code).

The environmental documentation, which is ultimately approved and/or certified by the City in accordance with CEQA, is intended as an informational document undertaken to provide an environmental basis for subsequent discretionary actions upon the project. However, the resulting documentation is not a policy document, and its approval and/or certification neither presupposes nor mandates any actions on the part of those agencies from whom permits and other discretionary approvals would be required.

1.2 PURPOSE

Section 15063 of the CEQA Guidelines identifies specific disclosure requirements for inclusion in an Initial Study. This Initial Study addresses the direct, indirect, and

cumulative environmental effects of the project, as proposed, under CEQA. Pursuant to those requirements, an Initial Study shall include:

- A description of the project, including the location of the project;
- Identification of the environmental setting;
- Identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries;
- Discussion of ways to mitigate significant effects identified, if any;
- Examination of whether the project is compatible with existing zoning, plans, and other applicable land use controls; and
- The name(s) of the person(s) who prepared or participated in the preparation of the Initial Study.

1.3 INCORPORATION BY REFERENCE

The references outlined below were utilized during preparation of this Initial Study. The documents are available for review at the City of Long Beach Community Development Department, located at 333 West Ocean Boulevard, Long Beach, California 90802.

- *City of Long Beach General Plan*. The *City of Long Beach General Plan* (*General Plan*) is the long-range planning guide for growth and development for the City. The *General Plan* sets forth the goals, policies, and directions the City will take in managing its future. The *General Plan* is the citizens' blueprint for development; the guide to achieving the City's vision. It is a comprehensive document that addresses seven mandatory elements/issues in accordance with State law. These elements include Land Use, Housing, Circulation, Conservation, Open Space, Noise, and Safety. Other optional issues that affect the City, including Air Quality, Scenic Routes, Seismic Safety, and a Local Coastal Program, have also been addressed in the *General Plan*.

  Each element of the *General Plan* was adopted as follows:

  - Land Use Element (1989);
  - Transportation Element (1991);
  - Open Space and Recreation Element (2002);
  - Public Safety Element (1975);
  - Housing Element (2009);
  - Noise Element (1975);
  - Conservation Element (1973);
  - Air Quality Element (1996);
  - Scenic Routes Element (1975); and
  - Local Coastal Program (1980).

The *General Plan* was utilized throughout this document as the fundamental planning document governing development on the project site. Background information and policy information from the *General Plan* is cited in several sections of this document.

- *City of Long Beach Municipal Code (enacted April 21, 2009)*. The *City of Long Beach Municipal Code (Municipal Code)*, enacted April 21, 2009, consists of regulatory, penal, and administrative ordinances of the City. It is the method the City uses to implement control of land uses, in accordance with *General Plan* goals and policies. The City Zoning Code, Title 21 of the *Municipal Code*, identifies land uses permitted and prohibited according to the zoning category of particular parcels. The Buildings and Construction Code (Title 18) specifies rules and regulations for construction, alteration, and building for uses of human habitation. Title 20, Subdivisions, is also regulated within the City's *Municipal Code*.

This page intentionally left blank.

2.0 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The City of Long Beach (City) is located in the southern portion of Los Angeles County; refer to Exhibit 2-1, *Regional Vicinity*. The River Avenue Storm Drain Project (herein referenced as the "project") involves approximately 1,800 linear feet of improvements. The proposed improvements extend from the intersection of Wardlow Road and River Avenue to the Southern California Edison (SCE) easement, located to the south of Arlington Street; refer to Exhibit 2-2, *Local Vicinity*.

2.2 ENVIRONMENTAL SETTING

2.2.1 Existing Land Uses

An existing storm drain facility extends along River Avenue and continues in a south-southwestern direction, within the SCE property. The following describes conditions in the project area:

- North. Land uses to the north include single-family residential uses. Wardlow Road/223rd Street is located to the north and trends east/west. Interstate 405 (I-405) trends north of the project area.
- East. Single- and multi-family residential uses, institutional uses, and the Union Pacific Railroad (UPRR) are in proximity to the east.
- South. Land uses to the south include SCE property (with a substation facility). To the south of the project area is the Dominguez Channel, and Pacific Ocean.
- West. Land uses to the west include single-family residential, the Union Pacific Intermodal Transfer Container Facility, and UPRR.

2.2.2 Existing Storm Water Drainage System

The existing River Avenue Storm Drain system traverses the cities of Long Beach, Los Angeles, and Carson and includes approximately 5,700 linear feet of 42- to 60-inch reinforced concrete pipe (RCP). The system provides drainage for a 237-acre watershed from Carson Street, at the upstream end of the watershed area, to the Dominguez Channel (along McHelen Avenue, River Avenue, and the previous Orange County Nursery). The existing storm drain design was based on hydrology that was completed in 1957 and consists of the following components:

- Project Site

NOT TO SCALE

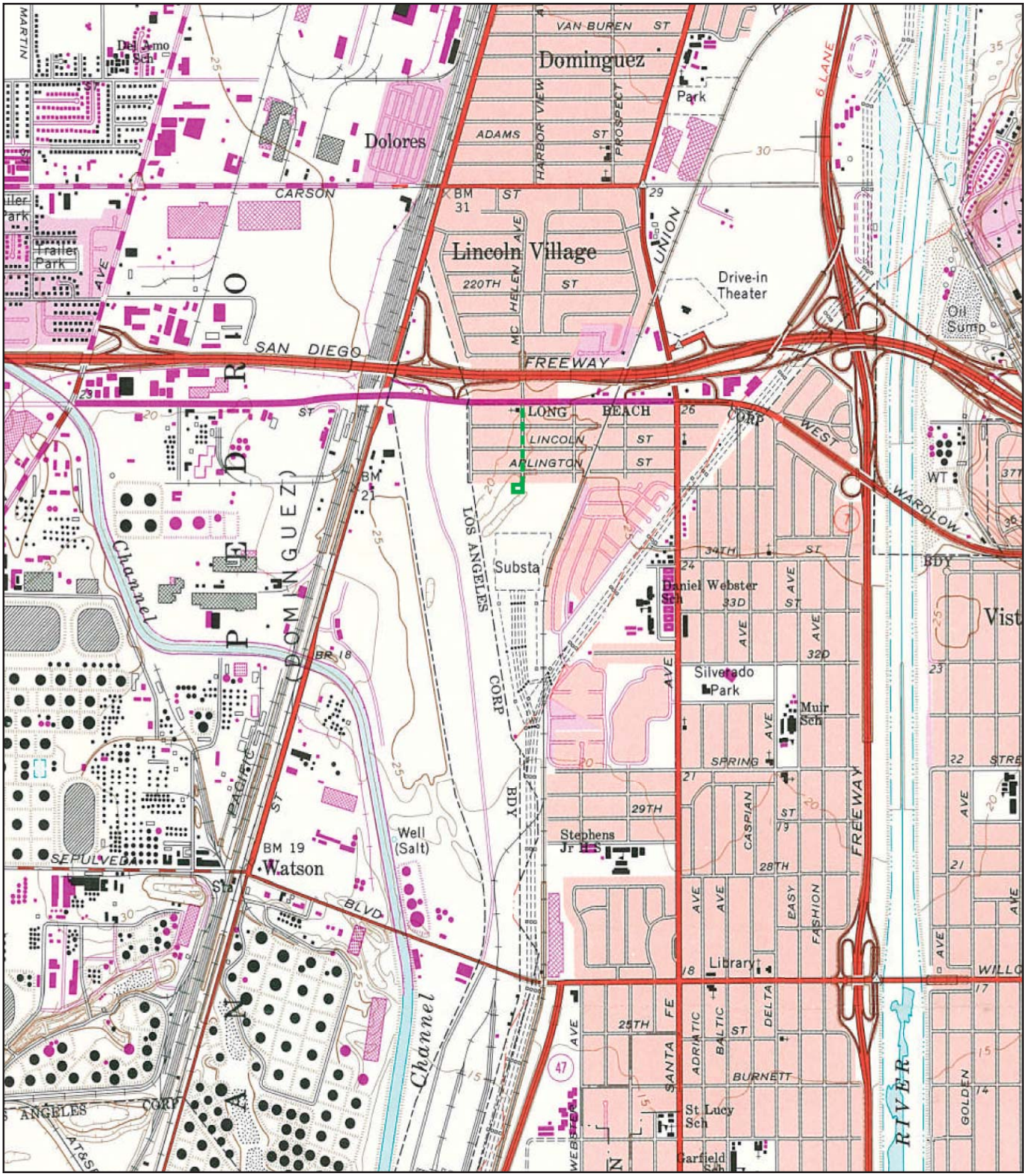
RBF CONSULTING

08/09 • JN 10-106837

RIVER AVENUE STORM DRAIN IMPROVEMENTS
INITIAL STUDY/MITIGATED NEGATIVE DECLARATION/ENVIRONMENTAL ASSESSMENT

Regional Vicinity

Exhibit 2-1



Source: USGS Map.
▬▬ - Site Limits

NOT TO SCALE

RBF CONSULTING

08/09 • JN 10-106837

RIVER AVENUE STORM DRAIN IMPROVEMENTS
INITIAL STUDY/MITIGATED NEGATIVE DECLARATION/ENVIRONMENTAL ASSESSMENT

Local Vicinity

Exhibit 2-2

- 5,700 feet of 42- to 60-inch RCP;
- Various lengths of 8- to 21-inch RCP connector pipes;
- Catch basin curb inlets located on Arlington Street and River Avenue; and
- A surface drain on the SCE property.

The 5-year flow rate for the mainline along River Avenue, upstream from Arlington Street, is 105 cubic feet per second (cfs). Based on 2005 hydrologic conditions, it was determined that the existing storm drain has a capacity of approximately 80 cfs at the intersection of Arlington Street and River Avenue. However, the catch basins along River Avenue are restricted and collect only 65 cfs. As the flow approaches the intersection of River Avenue and Arlington Street, the surface flow partially diverts toward the sump along Arlington Street (a 50 percent split occurs). The excess surface flow (approximately 40 cfs) that is not accommodated by the drainage system flows into a sump area on Arlington Street and onto adjacent properties (i.e., adjoining residential uses). The inadequate drainage system has resulted in several flooding occurrences.

2.3 BACKGROUND AND HISTORY

Residents in the low-lying 2300 block of Arlington Street (located in a sump) have experienced damage to homes and vehicles as a result of flooding events along the River Avenue storm drain segment. The sump is drained by two existing catch basins, and flows are conveyed through a 21-inch RCP connector pipe that outlets into the 60-inch RCP. The neighborhood has experienced flooding seven times in the last 22 years. The City has installed speed bumps at either end of Arlington Street in an attempt to divert storm water from the neighborhood and reduce the flooding severity and frequency. Other preventive measures and actions taken by the City to address Arlington Street flooding include the following:

- Improvements to existing catch basins to increase inlet capacity to 80 cfs;
- Clearing of the culvert on the SCE property;
- Removal of trees on the SCE property;
- Sandbags placed around the culvert;
- Public Works inspection of storm drains and debris removal;
- City inspection of storm drain outlets to the Dominguez Channel; and
- Public outreach meetings with City staff and residents regarding Arlington Street flooding.

Recurring flooding incidents have resulted in tens of thousands of dollars in home renovations and subsequent litigation. Flooding severity did increase when a retaining wall was built on the SCE property. Excess surface flows drained into the fields south of Arlington Street. However, the development to the south of Arlington Street has enclosed the neighborhood and restricted flows.

In 2007, the Los Angeles County Department of Public Works, Storm Drain Division, conducted a drainage study of the area for the City of Long Beach. The report concluded that the existing 60-inch storm drain pipe that collects storm water from the project area, as well as the adjoining SCE property and carries storm water flows

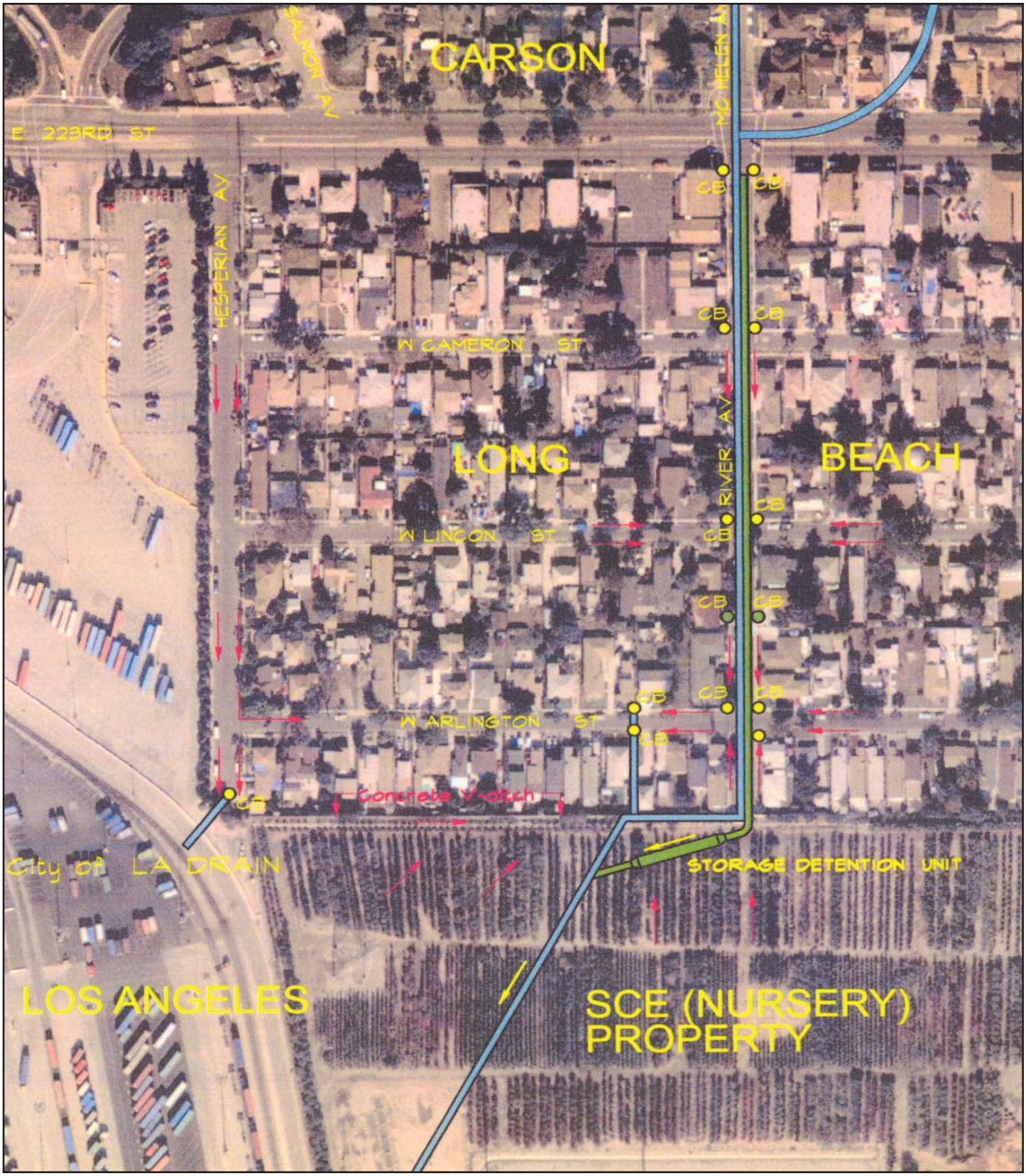
to the Dominguez Channel, is undersized, providing less than a five year protection level. The proposed project, the subject of this Initial Study, would increase flood protection in the Arlington Street neighborhood and alleviate current flooding hazards. The original project proposed a 5-year frequency storm protection system as part of the previous design concept. The excess flow rate of 40 cfs along River Avenue would be collected by two new upgraded catch basins constructed upstream of Arlington Street along River Avenue. The existing drain would capture 15 cfs and the remaining 25 cfs would be directed to a proposed retention system. Following subsequent analysis of the proposed 5-year frequency storm protection system, the proposed project has been revised to provide a 10-year protection level.

2.4 PROJECT CHARACTERISTICS

The inadequate River Avenue drainage system has resulted in flooding to adjacent residents. The project proposes to bring the flood protection in this area to a full 10 year protection level. The proposal involves construction of a parallel storm drain system along River Avenue (which is located from Wardlow Road/223rd Street to the north to an underground storage [detention] basin proposed on the SCE property). The detention basin would temporarily hold two acre-feet of storm water during heavy flows and then release the flows as the storm abates. The proposed detention basin would allow the downstream pipe to no longer flow full.

The existing storm drain system was analyzed to determine the level of flooding if a 10-year frequency storm occurred. The 10-year reported flow rate at the intersection of River Avenue and Arlington Street is 144 cfs. The proposed retention system combined with the existing drain system is anticipated to accept 105 cfs at the intersection. The excess surface runoff of 39 cfs would be above the property lines. In order to provide the desired 10-year frequency flood protection, a retention system consisting of 3,148 linear feet of 72-inch diameter RCP or high-density polyethylene (HDPE) and 317 linear feet of 30-inch diameter RCP or HDPE with seven additional catch basins would be necessary; refer to Exhibit 2-3, *Site Plan*. The City has elected to proceed with the 10-year frequency flood level protection. The project consists of the following elements:

- Construction of 1,021 feet of 48-inch reinforced concrete pipe along River Avenue, from Wardlow Road to the SCE property.
- Modification of five street level catch basins along River Avenue including the installation of trash and bacteria filters.
- Construction of six new street level catch basins along River Avenue including the installation of trash and bacteria filters.
- Construction of a detention system consisting of five 84-inch corrugated metal pipes, each 430 feet in length to be located within a dedicated easement on property owned by SCE in order to retain two acre-feet of storm drain flows.



Source: Los Angeles County Public Works.

- Surface Flow Direction
- Storm Drain
- Catch Basin

NOT TO SCALE

RIVER AVENUE STORM DRAIN IMPROVEMENTS
INITIAL STUDY/MITIGATED NEGATIVE DECLARATION/ENVIRONMENTAL ASSESSMENT

Site Plan

RBF CONSULTING

08/09 • JN 10-106837

Exhibit 2-3

- Modification of a surface inlet on the SCE property with a debris deflector.
- Construction of connecting pipes from the existing storm drain system to the detention system.
- Relocation of waterlines and gas lines along River Avenue.
- Preparation of a traffic control plan.

Construction equipment staging would be located on the SCE property. The proposed construction would consist of a 5-foot wide trench along River Avenue, from Wardlow Road to the SCE property, as well as 5-foot wide trenches on the SCE property, in order to accommodate the detention pipes. Approximately 1,250 square feet of asphalt would be hauled to an off-site location. Approximately 4,500 cubic yards of excavated soil would be deposited on the SCE property.

2.5 PROJECT PHASING

The project phasing would be as follows:

- Phase 1: Construction of the parallel drain on River Avenue
- Phase 2: Construction of the storm drain retention system

The project construction time frame would be as follows:

- Demolition – November 1, 2009 to December 15, 2009
- Trenching – November 1, 2009 to February 1, 2010
- Paving – December 30, 2009

2.6 AGREEMENTS, PERMITS, AND APPROVALS

The City and other applicable agency approvals required for development of the project would include the following, among others:

- California Environmental Quality Act clearance; and
- U.S. Department of Housing and Urban Development clearance.

The City would be acquiring a permanent drainage and temporary construction easement for the retention system from SCE.

This page intentionally left blank.

3.0 INITIAL STUDY CHECKLIST

3.1 BACKGROUND

1.	**Project Title:** River Avenue Storm Drain Improvements Project
2.	**Lead Agency Name and Address:** City of Long Beach 333 West Ocean Boulevard Long Beach, California 90802
3.	**Contact Person and Phone Number:** Mr. Mark Christoffels Deputy Director of Public Works/City Engineer 562.570.6771
4.	**Project Location:** The proposed project involves approximately 1,800 linear feet of pipeline infrastructure improvements, generally from the intersection of Wardlow Road and River Avenue to a Southern California Edison (SCE) easement, located to the south of Arlington Street; refer to Exhibit 2-2, *Local Vicinity*.
5.	**Project Sponsor's Name and Address:** Department of Public Works City of Long Beach 333 West Ocean Boulevard Long Beach, California 90802
6.	**General Plan Designation:** River Avenue is designated in the Transportation Element of the *General Plan* as a local roadway; the SCE easement is designated as Rights-of-Way.
7.	**Zoning Designation:** The portion of the project site located within River Avenue does not have a specific zoning designation; the portion of the project site within the SCE easement is zoned PR (Public Right-of-Way).
8.	**Description of the Project:** Refer to Section 2.4, *Project Characteristics*.
9.	**Surrounding Land Uses and Setting:** Refer to Section 2.1 and 2.3.1, *Project Location* and *Existing Land Uses*.
10.	**Other public agencies whose approval is required (e.g., permits, financing approval or participation agreement):** Refer to Section 2.6, *Agreements, Permits, and Approvals*.

3.2 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Less Than Significant Impact With Mitigation Incorporated," as indicated by the checklist on the following pages.

	Aesthetics		Land Use and Planning
	Agriculture Resources		Mineral Resources
✓	Air Quality	✓	Noise
	Biological Resources		Population and Housing
✓	Cultural Resources		Public Services
✓	Geology and Soils		Recreation
✓	Hazards & Hazardous Materials		Transportation/Traffic
	Hydrology & Water Quality		Utilities & Service Systems
✓	Mandatory Findings of Significance		

3.3 LEAD AGENCY DETERMINATION

On the basis of this initial evaluation:

I find that the proposed use COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ____

I find that although the proposal could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described in Section 4.0, *Inventory of Mitigation Measures*, have been added. A MITIGATED NEGATIVE DECLARATION will be prepared. ✓

I find that the proposal MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ____

I find that the proposal MAY have a significant effect(s) on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. ____

Jill Griffiths
Signature

Jill Griffiths
Printed Name

Advance Planning Officer
City of Long Beach
Agency

July 31, 2009
Date

3.4 EVALUATION OF ENVIRONMENTAL IMPACTS

This section analyzes the potential environmental impacts associated with the proposed project. The issue areas evaluated in this Initial Study include:

- Aesthetics
- Agriculture Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities and Service Systems

The environmental analysis in this section is patterned after the Initial Study Checklist recommended by the *CEQA Guidelines*, as amended, and used by the City of Long Beach in its environmental review process. For the preliminary environmental assessment undertaken as part of this Initial Study's preparation, a determination that there is a potential for significant effects indicates the need to more fully analyze the development's impacts and to identify mitigation.

For the evaluation of potential impacts, the questions in the Initial Study Checklist are stated and an answer is provided according to the analysis undertaken as part of the Initial Study. The analysis considers the long-term, direct, indirect, and cumulative impacts of the development. To each question, there are four possible responses:

- **No Impact.** The development will not have any measurable environmental impact on the environment.

- **Less Than Significant Impact.** The development will have the potential for impacting the environment, although this impact will be below established thresholds that are considered to be significant.

- **Less Than Significant With Mitigation Incorporated.** The development will have the potential to generate impacts, which may be considered as a significant effect on the environment, although mitigation measures or changes to the development's physical or operational characteristics can reduce these impacts to levels that are less than significant.

- **Potentially Significant Impact**. The development could have impacts, which may be considered significant, and therefore additional analysis is required to identify mitigation measures that could reduce potentially significant impacts to less than significant levels.

Where potential impacts are anticipated to be significant, mitigation measures will be required, so that impacts may be avoided or reduced to insignificant levels.

This page intentionally left blank.

4.0 ENVIRONMENTAL ANALYSIS

The project is being analyzed in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000-21177) and pursuant to Section 15063 of Title 14 of the California Code of Regulations (CCR), the City of Long Beach (City), acting in the capacity of Lead Agency.

The following provides a discussion of the potential project impacts as identified in the Initial Study/Mitigated Negative Declaration (IS/MND). Explanations are provided within each corresponding impact category in this analysis. An Environmental Assessment (EA) has been prepared pursuant to the U.S. Department of Housing and Urban Development (HUD) National Environmental Policy Act (NEPA) guidelines, as HUD would be funding a portion of the proposed project. The EA contains an analysis of the potential environmental impacts that would result from implementation of the proposed project in compliance with NEPA. The analysis contained within the EA includes several references to the project IS/MND where similar impacts have been previously analyzed. The Environmental Assessment can be found in Part 2 of this document.

This page intentionally left blank.

4.1 AESTHETICS

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?				✓
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				✓
c. Substantially degrade the existing visual character or quality of the site and its surroundings?			✓	
d. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?			✓	

a) Have a substantial adverse effect on a scenic vista?

No Impact. According to the *City of Long Beach General Plan (General Plan)*, the City has multiple aesthetic visual assets. Visual assets include vistas of the ocean, port facilities, oil islands, Bixby Park, Bluff Park, and other vantage points. Additionally, views from Signal Hill are important visual assets to the City. No identified scenic vistas are located within the viewshed of the proposed project. Views are not afforded to the ocean, or any open space or park within the vicinity of the project site. Therefore, as no scenic vistas are located within the viewshed of the project, no impact would occur.

Mitigation Measures: No mitigation measures are required.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. Although there are no existing designated state scenic highways in the City or within the project area, the California Department of Transportation (Caltrans) has designated Pacific Coast Highway (PCH) as an eligible scenic highway in the southeastern portion of the City. PCH is located approximately five miles to the southeast and is not visible from the project site.

The City's *General Plan* identifies aesthetic assets for historic, cultural, and architectural uses. Historical assets range from two preserved ranches, Rancho Los Cerritos, and Rancho Los Alamitos, to the first oil well "Alamitos 1," located at Signal Hill. Cultural assets include the downtown Civic Center Complex, the Pacific Terrace Center, the Queen Mary, the California State University at Long Beach campus, and the Long Beach City College campuses. Architectural assets include the Villa Riviera, the Greene and Greene residence, the Los Alamitos Rancho adobe, the Art Museum. Although several aesthetic assets are identified in the *General Plan*, none of these resources are located in proximity to the project site or would be affected by the proposed project. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less Than Significant Impact. During project construction activities, the existing visual character of the project site and local area may be temporarily altered. Construction-related activities would be visible from nearby residents. Trenching activities, construction equipment, and truck traffic would be visible. Equipment for construction activities would be staged on the SCE easement, and would not be visible to surrounding residents.

Although construction activities would be visible, the proposed areas of disturbance would remain within existing roadways and the SCE property. Construction activities along River Avenue would be short-term and would cease upon completion. Additionally, implementation of the required permits for the Regional Water Quality Control Board (RWQCB), such as the National Pollution Discharge Elimination System (NPDES), Storm Water Pollution Prevention Plan (SWPPP), as well as the required Best Management Practices (BMPs), would reduce potential impacts from visible dust and track out areas. Therefore, as construction-related activities are anticipated to be short-term, impacts are less than significant.

Upon project completion, views in the project area would remain similar to existing conditions, as the proposed improvements would be located underground. Therefore, long-term visual impacts would also be less than significant.

Mitigation Measures: No mitigation measures are required.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact. There are two primary sources of light: light emanating from building interiors that pass through windows and light from exterior sources (i.e., street lighting, parking lot lighting, building illumination, security lighting, and landscape lighting). Light introduction can be a nuisance to adjacent uses, and diminish the view of the night sky.

Currently, light and glare in the project vicinity is produced by vehicle headlights, street lighting, and lighting from the adjacent residential uses. Also, minimal security lighting associated with the SCE property is currently being emitted at the project site.

In accordance with Title 8, *Health and Safety,* of the City of Long Beach *Municipal Code* (*Municipal Code*), the project's construction activities would be limited to the hours of 7:00 a.m. and 7:00 p.m. on weekdays and federal holidays, and between 9:00 a.m. and 6:00 p.m. on Saturdays. Also, construction activities are prohibited on Sundays. Therefore, as the construction activities would cease by 7:00 p.m. (6:00 p.m. on Saturdays), the construction-related light and glare effects would also cease by 7:00 p.m. (6:00 p.m. on Saturdays). Impacts in this regard would be less than significant with adherence to the City's *Municipal Code* requirements.

The proposed storm drain facilities would not create a new source of light or glare onto surrounding uses during operations, as improvements would be located underground. No impact would result in this regard

Mitigation Measures: No mitigation measures are required.

This page is intentionally left blank.

4.2 AGRICULTURE RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓
c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				✓

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. The project site and surrounding area are located in an urbanized area of the City. The project site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as designated by the California Department of Conservation, which has designated the area as "Urban and Built Up Land." The project site encompasses roadway uses (located within existing roadway rights-of-way) and an easement on the SCE property which was previously utilized as a plant nursery storage area. Thus, project implementation would not result in the conversion of farmland to non-agricultural use. No impacts would occur in this regard.

Mitigation Measures: No mitigation measures are required.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The project site is not designated for agricultural use or in a Williamson Act contract, as the project site consists of a roadway and an SCE easement. River Avenue does not have a specific zoning designation; the SCE easement is zoned PR (Public Right-of-Way) and is designated as Rights-of-Way on the City's Land Use Map. Therefore, implementation of the project would not conflict with existing zoning for agricultural use or a Williamson Act contract, and no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

c) ***Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?***

No Impact. Refer to Response 4.2 (a) and (b). The project site or surrounding area are not used for agricultural production. Implementation of the proposed project would not result in environmental changes that would convert farmland to non-agricultural use.

Mitigation Measures: No mitigation measures are required.

4.3 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?			✓	
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		✓		
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?		✓		
d. Expose sensitive receptors to substantial pollutant concentrations?		✓		
e. Create objectionable odors affecting a substantial number of people?			✓	

The project site is located within the City of Long Beach, which is part of the South Coast Air Basin (Basin) and under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is one of 35 air quality management districts that have prepared an *Air Quality Management Plan* (AQMP) to accomplish a five-percent annual reduction in emissions. The most recent AQMP was adopted in 2007.

Both the State of California and the Federal government have established health-based Ambient Air Quality Standards (AAQS) for criteria air pollutants. These pollutants include carbon monoxide (CO), ozone (O_3), nitrogen oxides (NO_X), sulfur oxides (SO_X), particulate matter up to 10 microns and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively), and lead (Pb). O_3 is formed by a photochemical reaction between NO_X and volatile organic compounds (VOCs). Thus, impacts from O_3 are assessed by evaluating impacts from NO_X and VOCs.

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. Consistency with the *2007 Air Quality Management Plan for the South Coast Air Basin* (*2007 AQMP*) means that a project is consistent with the goals, objectives, and assumptions in the respective plan to achieve the Federal and State air quality standards. Per the SCAQMD *CEQA Air Quality Handbook*, there are two main indicators of a project's consistency with the applicable Air Quality Management Plan:

- Whether the project would increase the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the *2007 AQMP*; and

- Whether the project would exceed the *2007 AQMP's* assumptions for 2030 or yearly increments based on the year of project buildout and phasing.

As indicated in the operational analysis provided in Impact Statement 7(b), below, the proposed project would not exceed the SCAQMD's thresholds of significance. Therefore, the proposed project is consistent with the *2007 AQMP* in this regard.

The project is consistent with the *General Plan* and zoning designations for the City of Long Beach. The project proposes storm drain improvements which would be located underground. Therefore, as no development is proposed that would result in long-term, operational emissions, the project is consistent with the *2007 AQMP* and would, therefore, not result in any violations with the long-range plans for the Basin. No significant impacts are anticipated and no mitigation measures are required. The proposed project would also not induce substantial population growth either directly or indirectly. Therefore, the proposed project would be consistent with the *2007 AQMP* employment and population forecasts and a less than significant impact would occur.

Mitigation Measures: No mitigation measures are required.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less Than Significant Impact with Mitigation Incorporated.

Short-Term Construction Impacts

Short-term air quality impacts are anticipated during construction activities associated with implementation of the proposed project. Temporary air emissions would result from the following activities:

- Particulate (fugitive dust) emissions from earth moving activities; and
- Exhaust emissions from the construction equipment and the motor vehicles of the construction crew.

Construction activities entail demolition of existing asphalt, excavation of trenches, placement of pipelines, backfill and compaction, and re-paving the disturbed area. Demolition activities would include approximately 46.3 cubic yards of demolition debris (asphalt) and trenching activities would involve 4,500 cubic yards of soil to be deposited on the SCE property.

The URBEMIS 2007 computer model calculates criteria pollutants as part of construction activity emissions; refer to Table 4.3-1, *Construction Air Emissions*. PM_{10} and $PM_{2.5}$ emissions would primarily occur from construction equipment exhaust and not from fugitive dust. As depicted in Table 4.3-1, construction-related emissions would not exceed the established SCAQMD thresholds for criteria pollutants. Additionally, compliance with Mitigation Measures AQ-1 through AQ-4 would ensure compliance with SCAQMD standard regulations, resulting in a less than significant short-term construction impact for PM_{10} and $PM_{2.5}$.

Construction Equipment and Worker Vehicle Exhaust

Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to/from the site. As presented in Table 4.3-1, construction equipment and worker vehicle exhaust emissions would be below the established SCAQMD thresholds. Therefore, air quality impacts from equipment and vehicle exhaust emission would be less than significant.

Table 4.3-1
Construction Air Emissions

Emissions Source	Pollutant (pounds/day)[1, 2]					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2009						
Unmitigated Emissions	4.57	32.37	18.75	0.00	2.08	1.90
2010						
Unmitigated Emissions	2.09	17.75	9.26	0.00	0.89	0.81
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Is Threshold Exceeded?	*No*	*No*	*No*	*No*	*No*	*No*

Notes:
1. Emissions were calculated using the URBEMIS 2007 version 9.2.4 Computer Model, as recommended by the SCAQMD.
2. Refer to Appendix A, *Air Quality Data*, for assumptions used in this analysis.

Asbestos

Pursuant to guidance issued by the Governor's Office of Planning and Research, State Clearinghouse, lead agencies are encouraged to analyze potential impacts related to naturally occurring asbestos (NOA). Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by State, Federal, and international agencies, and was identified as a toxic air contaminant by the California Air Resources Board (CARB) in 1986.

Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the counties of the Sierra Nevada foothills, the Klamath Mountains, and Coast Ranges. According to the Department of Conservation Division of Mines and Geology, *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report* (dated August 2000), the proposed project is not located in an area where NOA is likely to be present. Therefore, no impacts are anticipated in this regard.

Long-Term Operational Impacts

The project proposes storm drain improvements that would not result in any permanent or long-term emissions. Additionally, the proposed improvements would not generate new traffic trips. Therefore, no significant long-term emissions are anticipated and no mitigation measures are required.

Mitigation Measures:

Construction Impacts

AQ-1 During clearing, grading, earth moving, or excavation operations, excessive fugitive dust emissions must be controlled by regular water or other dust preventive measures using the following procedures, as specified in the SCAQMD Rule 403.

- Limit on-site vehicle speed to 15 miles per hour.
- Water material excavated or graded sufficiently to prevent excessive amounts of dust. Water at least twice daily with complete coverage, preferably in the late morning and after work is done for the day.
- Water or securely cover material transported on-site or off-site sufficiently to prevent generating excessive amounts of dust.
- Minimize area disturbed by clearing, grading, earth moving, or excavation operations so as to prevent generating excessive amounts of dust.
- Indicate these control techniques in project specifications. Compliance with the measure will be subject to periodic site inspections by the City.
- Prevent visible dust from the project from emanating beyond the property line, to the maximum extent feasible.
- Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for ten days or more).
- Trucks transporting soil, sand, cut or fill materials, and/or construction debris to or from the site must be tarped from the point of origin.

AQ-2 Ozone precursor emissions from construction equipment vehicles must be controlled by maintaining equipment engines in good condition and in proper tune per manufacturer's specifications, to the satisfaction of the City Engineer. Compliance with this measure must be subject to periodic inspections of construction equipment vehicles by the City and included in construction bid documents.

AQ-3 All trucks that are to haul material must comply with California Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2) and (e)(4) as amended, regarding the prevention of such material spilling onto public streets and roads. This provision must be provided in construction bid documents.

AQ-4 Construction hours, allowable work days, and phone numbers of the job superintendent must be clearly posted at all construction entrances to allow for surrounding property owners and residents to contact the job superintendent. If the job superintendent receives a complaint, appropriate corrective actions must be implemented immediately and a report taken to the reporting party.

AQ-5 Backup generators shall be used only for emergency operations. All backup generators shall be selected in consultation with the SCAQMD from their list of certified internal combustion engines.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less Than Significant Impact with Mitigation Incorporated.

The SCAQMD neither recommends quantified analysis of cumulative construction or operational emissions, nor does it provide separate methodologies or thresholds of significance to be used to assess cumulative construction or operational impacts. However, if individual development projects generate operational emissions that exceed the SCAQMD recommended daily thresholds, project-specific impacts would also cause a cumulative considerable increase in emissions for those pollutants for which the Basin is in non-attainment.

Cumulative Construction Impacts

With respect to the proposed project's construction-period air quality emissions and cumulative Basin-wide conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the *2007 AQMP* pursuant to Federal Clean Air Act mandates. As such, the proposed project would comply with SCAQMD Rule 403 requirements, and implement all feasible mitigation measures. Rule 403 requires that fugitive dust be controlled with the best available control measures in order to reduce dust so that it does not remain visible in the atmosphere beyond the property line of the proposed project. In addition, the proposed project would comply with adopted *2007 AQMP* emissions control measures. Per SCAQMD rules and mandates, as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (i.e., Rule 403 compliance, the implementation of all feasible mitigation measures, and compliance with adopted Air Quality Management Plan emissions control measures) would also be imposed on construction projects throughout the Basin, which would include related projects.

Compliance with SCAQMD rules and regulations, as well as implementation of Mitigation Measures AQ-1 through AQ-5, would reduce the project's construction-related impacts to a less than significant level. Thus, it can be reasonably inferred that the project-related construction emissions, in combination with those from other projects in the area, would not substantially deteriorate the local air quality. Thus, a less than significant impact would occur in this regard.

Cumulative Long-Term Impacts

As discussed previously, the proposed storm drain improvement project would not result in long-term air quality impacts. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. Emission reduction technology, strategies, and plans are constantly being developed. As a result, the proposed project would not contribute a cumulatively considerable net increase of any nonattainment criteria pollutant. Therefore, no impacts to cumulative operational impacts associated with project operations would result.

Global Climate Change Impacts

California is a substantial contributor of global greenhouse gases, emitting over 400 million tons of CO_2 a year.[1] Climate studies indicate that California is likely to see an increase of three to four degrees Fahrenheit over the next century. Methane is also an important greenhouse gas that potentially contributes to global climate change. Greenhouse gases are global in their effect, which is to increase the earth's ability to absorb heat in the atmosphere. As primary greenhouse gases have a long lifetime in the atmosphere, accumulate over time, and are generally well-mixed, their impact on the atmosphere is mostly independent of the point of emission.

The impact of anthropogenic activities on global climate change is apparent in the observational record. Air trapped by ice has been extracted from core samples taken from polar ice sheets to determine the global atmospheric variation of CO_2, methane, and nitrous oxide from before the start of the industrialization (approximately 1750), to over 650,000 years ago. For that period, it was found that CO_2 concentrations ranged from 180 parts per million (ppm) to 300 ppm. For the period from approximately 1750 to the present, global CO_2 concentrations increased from a pre-industrialization period concentration of 280 ppm to 379 ppm in 2005, with the 2005 value far exceeding the upper end of the pre-industrial period range.

The Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400 to 450 ppm carbon dioxide-equivalent concentration is required to keep mean global warming below 2°C, which in turn is assumed to be necessary to avoid dangerous climate change.

[1] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks:1990 to 2004,* 2006.

Regulations and Significance Criteria

California Governor Arnold Schwarzenegger issued Executive Order S-3-05 in June 2005, which established the following greenhouse gas emission reduction targets:

- 2010: Reduce greenhouse gas emissions to 2000 levels
- 2020: Reduce greenhouse gas emissions to 1990 levels
- 2050: Reduce greenhouse gas emissions to 80 percent below 1990 levels

AB-32 requires that the California Air Resources Board (CARB) determine what the statewide greenhouse gas emissions level was in 1990, and approve a statewide greenhouse gas emissions limit that is equivalent to that level, to be achieved by 2020. CARB has approved a 2020 emissions limit of 427 metric tons of CO_2 equivalents ($MTCO_2eq$).

A quantitative non-zero project specific threshold has been utilized which uses a methodology recommended by the California Air Pollution Control Officers Association (CAPCOA).[2] According to CAPCOA's *Threshold 2.3, CARB Reporting Threshold,* 10,000 metric tons of carbon dioxide equivalents[3] per year ($MTCO_2eq/yr$) is recommended as a quantitative non-zero threshold.[4] This threshold is being considered by the California Market Advisory Committee, whose mandate under the California Environmental Protection Agency is to develop market-based compliance mechanisms for reducing greenhouse gases. According to the CAPCOA White Paper; this threshold would be equivalent to 550 dwelling units, 400,000 square feet of office use, 120,000 square feet of retail, or 70,000 square feet of supermarket use. This approach is estimated to capture over half of the future residential and commercial development projects, and is designed to ensure the goals of Assembly Bill 32 are not hindered.

Greenhouse Gas Emissions Analysis

As shown below in Table 4.3-2, *Estimated Greenhouse Gas Emissions*, the proposed project would result in 81.1 $MTCO_2eq/year$ in 2009, and 15.8 $MTCO_2eq/year$ in 2010 of greenhouse gas emissions during the construction phase. Therefore, a less than significant impact would occur in this regard.

2 California Air Pollution Control Officers Association, *CEQA & Climate Change White Paper*, January 2008.

3 Carbon dioxide equivalent is a quantity that describes, for a given mixture and amount of greenhouse gas, the amount of CO2 that would have the same global warming potential, when measured over a specified timescale (generally 100 years).

4 It should be noted that CARB has also recommended 10,000 $MTCO_2eq/yr$ as the "de minimus greenhouse gas emission threshold" in their *Climate Change Proposed Scoping Plan*, which was approved by CARB's Board on January 11, 2009.

Table 4.3-2
Estimated Greenhouse Gas Emissions

Source	CO_2	N_2O		CH_4	
	Metric tons/year	Metric tons/year	Metric tons of CO_2eq[2]	Metric tons/year	Metric tons of CO_2eq[2]
Construction Emissions[1]					
• Year 2009	78.09	0.01	2.97	0.00	0.04
2009 Total Project-Related Emissions ($MTCO_2eq/year$)[3]	*81.1*				
Greenhouse Gas Threshold ($MTCO_2eq/year$)	*10,000*				
Is Threshold Exceeded?	*No*				
• Year 2010	15.02	0.00	0.77	0.00	0.01
2010 Total Project-Related Emissions ($MTCO_2eq/year$)[3]	*15.8*				
Greenhouse Gas Threshold ($MTCO_2eq/year$)	*10,000*				
Is Threshold Exceeded?	*No*				

Notes:
1. Emissions calculated using the California Air Resources Board's Construction Equipment Emissions Table and the Road Construction Emissions Model, Version 6.3.1 output.
2. CO_2 Equivalent values calculated using the U.S. Environmental Protection Agency Website, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/cleanenergy/energy-resources/calculator.html, accessed July 2009.
3. Totals may be slightly off due to rounding.
4. Refer to Appendix A, *Air Quality Data*, for detailed model input/output data.

Mitigation Measures: Refer to Mitigation Measures AQ-1 through AQ-5 to reduce the project's cumulative contribution of criteria pollutants. No additional mitigation measures are required.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact with Mitigation Incorporated.

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

Sensitive receptors near the project site are the existing residences surrounding the project site to the east and west. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds for construction and operations impacts. A carbon monoxide hot-spot analysis was not performed in this analysis as the proposed project would not create a significant amount of traffic trips.

Localized Significance Thresholds (LST)

Localized Significance Thresholds (LST) were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated June 2003) for guidance. The LST methodology assists lead agencies in analyzing localized impacts associated with project-specific level projects proposed. The SCAQMD provides the LST lookup tables for one, two and five acre projects emitting CO, NO_X, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors.

The proposed project area includes less than one acre of land within the City; therefore, a Localized Significance Thresholds analysis was performed. The project is located within Sensitive Receptor Area (SRA) 4, South Coastal LA County.

The closest sensitive receptors to the project site are residential units located approximately six meters from the nearest improvements. These residential units may be potentially affected by air pollutant emissions generated during on-site construction activities. Since the nearest sensitive receptor is less than 25 meters away, the smallest localized significance threshold value of 25 meters was utilized as a threshold.

Table 4.3-3, *Summary of Localized Significance of Construction Emissions*, shows the construction-related emissions for NO_X, CO, PM_{10}, and $PM_{2.5}$ compared to the localized significance thresholds for SRA 4, South Coastal LA County, at a distance of 25 meters for a one-acre site. As shown in Table 4.3-3, construction emissions would not exceed the localized significance thresholds. Additionally, compliance with Mitigation Measures AQ-1 through AQ-5 would further reduce potential construction emissions. Therefore, localized air quality impacts would be less than significant.

Table 4.3-3
Summary of Localized Significance of Construction Emissions

Construction Phase	Pollutant (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Total 2009 Emissions	32.37	18.75	2.08	1.90
Localized Significance Threshold	46	574	4	3
Thresholds Exceeded?	*No*	*No*	*No*	*No*
Total 2010 Emissions	17.75	9.26	0.89	0.81
Localized Significance Threshold	46	574	4	3
Thresholds Exceeded?	*No*	*No*	*No*	*No*

Note:
1. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the anticipated daily acreage disturbance (approximately 1 acre) and the source receptor area (SRA 4).

Mitigation Measures: Refer to Mitigation Measures AQ-1 through AQ-5. No additional mitigation measures are required.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust. Construction-related odors would be short-term in nature and cease upon project completion. Any impacts to existing adjacent land uses would be short-term, as previously noted, and are less than significant.

Mitigation Measures: No mitigation measures are required.

4.4 BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			✓	
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			✓	
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				✓
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				✓
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				✓
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				✓

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant Impact. As a result of the urbanized and developed nature the project site and the lack of significant native habitats, the project site does not contain native plants and wildlife. The proposed detention unit would be located within the SCE easement, which has been utilized as a plant nursery. The nursery is currently in the process of ceasing operations on the SCE property. At the time of commencement of construction activities, the nursery will have vacated the site, and the SCE easement will be vacant.

The Conservation Element of the *General Plan* identifies the following habitats in the City:

- Riparian;
- Ponds and Lakes;
- Freshwater Streams and Rivers;
- Freshwater Marsh;
- Salt Marsh and Estuaries;

- Mudflat (Tidal);
- Rocky Coastal;
- Sandy Coastal;
- Open Sea;
- Open Space; and
- El Dorado Preserve and Nature Center.

The project site is not located within any habitat areas of the City according to Figure 5, Habitats, of the Conservation Element. The nearest habitat location is approximately 0.95 miles east within the Los Angeles River. The proposed areas for improvement have no potential to support State- or Federally-listed special status plant or wildlife species and no focused surveys for any special status species are required. Therefore, impacts in this regard would be less than significant.

Mitigation Measures: No mitigation measures are required.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant Impact. No riparian habitats or sensitive natural communities are present on-site. The proposed improvement area is located within existing roadways and/or areas that have already been previously disturbed. As a result of the developed nature of the project site and the lack of significant native habitats on-site, the project site is not considered a sensitive natural community.

Mitigation Measures: No mitigation measures are required.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. No wetlands, Waters of the United States, and other areas are located within the boundaries of the proposed improvements. The project site is not subject to the jurisdiction of the Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG), or the Regional Water Quality Control Board (RWQCB). Therefore, no impacts would occur in this regard.

***Mitigation Measures*:** No mitigation measures are required.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

No Impact. Refer to Response 4.4(a) above. The project site does not contain habitat to support any native resident or migratory fish or wildlife species. The proposed storm drainage improvements would not interfere with the movement of fish or wildlife. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The project would comply with Chapter 14.28, *Trees and Shrubs*, of the City's *Municipal Code*, which contains regulations on tree and shrub planting, removal, and maintenance, including the protection of all trees located along the street, alley, court, or other public place during construction activities. No other local policies, ordinances, or plans protecting biological resources exist for the project site. No impacts would occur in this regard.

Mitigation Measures: No mitigation measures are required.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. Refer to Response 4.4(e), above. Implementation of the proposed project would not conflict with any adopted Habitat Conservation Plans, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans. No impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

This page intentionally left blank.

4.5 CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5?				✓
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5?		✓		
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			✓	
d. Disturb any human remains, including those interred outside of formal cemeteries?			✓	

a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5?

No Impact. The project site is located within a residential neighborhood and an SCE easement, and no identified historical resources are known to be present in the project area. Therefore, the project would not cause a substantial adverse change to any previously identified historical resources or historic properties. No impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5?

Less Than Significant With Mitigation Incorporated. Implementation of the proposed project would result in some ground disturbance associated with trenching activities along River Avenue and within the SCE easement. The project would include trenching activities within River Avenue (approximately five feet wide by 10 feet deep) as well as at the SCE easement (approximately 40 feet wide by 12 feet deep). Due to the urbanized nature of the project site, construction activities are not anticipated to impact any undocumented buried archaeological resources. However, construction excavation could disturb previously unidentified subsurface resources that lie beyond the disturbed sediments (both horizontally and vertically). In the event archaeological resources are unearthed or discovered during construction, activities, compliance with the recommended Mitigation Measure CUL-1 would reduce potential impacts to less than significant levels.

Mitigation Measures:

CUL-1 If cultural materials or archeological remains are encountered during the course of grading or construction activities, the project contractor shall cease any ground disturbing activities near the find. A qualified archaeologist, approved by the City of Long Beach, shall be retained to

evaluate significance of the resources and recommend appropriate treatment measures. Treatment measures may include avoidance, preservation, removal, data recovery, protection, or other measures developed in consultation with the City of Long Beach.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant. The project site is located within a generally flat area of the City and not within the vicinity of a unique geologic feature. No paleontological sites are expected to exist in the project site or in the immediate vicinity. The majority of the project site lies within River Avenue, which has been previously disturbed. Additionally, the SCE property has been previously disturbed during the construction of the existing storm drain system. Trenching activities proposed within River Avenue would be approximately five feet wide by 10 feet deep and approximately 40 feet wide by 12 feet deep at the SCE easement. Therefore, impacts in this regard would be less than significant.

Mitigation Measures: No mitigation measures are required.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant. No on-site conditions exist that suggest human remains are likely to be found on the project site. However, in the unlikely event that human remains are encountered during construction activities, protocol in accordance with State of California Public Resources Heath and Safety Code Section 7050.5-7055 would be required. Also, as required by State law, the requirements and procedures set forth in Section 5097.98 of the California Public Resources Code would be implemented, including notification of the County Coroner, notification of the Native American Heritage Commission, and consultation with the individual identified by the Native American Heritage Commission to be the “most likely descendent”. Impacts in this regard would be reduced to less than significant levels.

Mitigation Measures: No mitigation measures are required.

4.6 GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				✓
2) Strong seismic ground shaking?			✓	
3) Seismic-related ground failure, including liquefaction?		✓		
4) Landslides?				✓
b. Result in substantial soil erosion or the loss of topsoil?			✓	
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		✓		
d. Be located on expansive soil, as defined in Table 18-1-B of the California Building Code (2004), creating substantial risks to life or property?			✓	
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				✓

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

1) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

No Impact. For the purposes of the Alquist-Priolo Earthquake Fault Zoning Act, the State of California defines active faults as those that have historically produced earthquakes or shown evidence of movement within the past 11,000 years (during the Holocene Epoch).[1] Based on the *Geotechnical Investigation* for the project, prepared by Kleinfelder on May 16, 2008 (refer to Appendix B, *Geotechnical Investigation*), the site is not included in the Earthquake Fault Zones established under the Alquist-Priolo Earthquake Fault Zoning Act. The closest mapped fault to the project site is the Newport-Inglewood Fault, located approximately 1.2 miles northeast of the project site. Also, the Palos Verdes Fault is located approximately six miles southwest of the project site.

[1] California Department of Conservation and California Geologic Survey. Potentially active faults have demonstrated displacement within the last 1.6 million years (during the Pleistocene Epoch), but do not displace Holocene Strata. Inactive faults do not exhibit displacement younger than 1.6 million years before the present.

Despite the project's proximity to the Newport-Inglewood Fault, no known active faults traverse the project site. Also, numerous controls would be imposed on the proposed project through the engineering review and permitting process. In general, the City regulates projects under the requirements of the California Building Code, the Alquist-Priolo Special Studies Zone Act, local land use policies, zoning, and the City's *Municipal Code*. Therefore, no impact would result due to rupture of a known earthquake fault. No impacts would occur in this regard.

***Mitigation Measures*:** No mitigation measures are required.

2) Strong seismic ground shaking?

Less Than Significant Impact. Although the project site is located greater than one mile from the Newport-Inglewood Fault, the potential exists for the project site to experience strong seismic ground shaking from the Newport-Inglewood Fault, as well as from other faults located off-site in the region. The intensity of ground shaking at the project site would depend upon the magnitude of the earthquake, distance to the epicenter, and geology of the area between the epicenter and the project site. Strong seismic ground shaking may result in damage to the proposed storm drain pipelines and detention unit.

The project is subject to compliance with the California Department of Conservation, California Geologic Survey Special Publications 117, *Guidelines for Evaluating and Mitigating Seismic Hazards in California* (1997), which provides guidance for evaluation and mitigation of earthquake-related hazards. In addition, the project is subject to compliance with Code Section 18.24, *Building Codes*, which specifies seismic design requirements. Adherence to standard engineering practices and Code requirements relative to seismic and geologic hazards would minimize potential impacts pertaining to potential damage to the proposed storm drain pipelines and detention unit. Also, the project does not include the construction or modification of habitable structures. Therefore, project implementation would result in less than significant impacts associated with the exposure of people or structures to potential substantial adverse effects involving strong seismic ground shaking.

Mitigation Measures: No mitigation measures are required.

3) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact With Mitigation Incorporated. Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Liquefaction is characterized by a loss of shear strength in the affected soil layers, thereby causing the soils to behave as a viscous liquid. Susceptibility to liquefaction is based on geologic and geotechnical data. River-channels and flood-plains are considered most susceptible to liquefaction, while alluvial fans have a lower susceptibility. Depth to groundwater is another important element in the susceptibility to liquefaction. Groundwater shallower than 30 feet results in high to very high susceptibility to liquefaction, while deeper water results in low and very low susceptibility. According to the *Geotechnical Investigation,* groundwater was encountered at a depth of 25 feet.

Based on the *Geotechnical Investigation*, the project site is located within a seismic hazard zone for liquefaction potential, as designated by the State and County of Los Angeles. The *Geotechnical Investigation* estimates that the total and differential settlements due to liquefaction along the storm drain alignment may be approximately 1.5 inches and 0.75 inches, respectively. Due to the soil types and relative density encountered in the exploratory borings, the liquefaction potential along the project alignment is considered to be moderate.

As a result of to the City's geological, geotechnical, and groundwater conditions, the potential exists for the occurrence of liquefaction which could result in damage to the storm drain pipelines and detention unit. With implementation of Mitigation Measure GEO-1, recommended by the *Geotechnical Investigation*, the project would require a soils report to identify the potential for liquefaction, expansive soils, ground settlement, slope failure, and groundwater. Verification of potential liquefaction within proposed pipeline areas would be analyzed and recommendations to reduce these impacts would occur. Additionally, the proposed project, with implementation of Mitigation Measure GEO-1, would further strengthen the City's storm drainage system to withstand the occurrence of liquefaction compared to existing conditions. Therefore, with implementation of Mitigation Measure GEO-1, impacts would be reduced to less than significant levels.

Mitigation Measures:

GEO-1 Prior to grading operations, a soils report shall be prepared for the proposed improvements to identify the potential for liquefaction, expansive soils, ground settlement, and slope failure. The report shall also:

- Specify loose alluvium that shall be excavated and removed from the site, as it is considered unsuitable for reuse as structural fill.
- Specify remedial measures that could be feasibly implemented to minimize potential impact.
- Analyze the potential for groundwater within the study area and recommend measures to remediate associated conditions.
- Determine the need for dewatering of areas during construction to remove all water within the excavation perimeter and recommend appropriate method of dewatering.

4) Landslides?

No Impact. According to the *Geotechnical Investigation,* the project site is not located within a State or County designated hazard zone for landslides. The majority of the City consists of relatively flat topography, and the project does not propose any design slopes. Therefore, project implementation would note expose people or structures to potential substantial adverse effects involving landslide. No impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. Soils throughout the project area are sensitive to disturbance during construction activities. Trenching activities for the construction of the storm drain improvements would expose soils to potential short-term erosion by wind and water. The project would be subject to compliance with the requirements set forth in the National Pollutant Discharge Elimination System (NPDES) Storm Water General Construction Permit for construction activities. Following compliance with the NPDES permit, project implementation would result in a less than significant impact regarding soil erosion.

Mitigation Measures: No mitigation measures are required.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less Than Significant Impact With Mitigation Incorporated. Refer to Response 4.6(a)(1), 4.6(a)(3), and 4.6(a)(4).

Mitigation Measures: Refer to Mitigation Measure GEO-1.

d) Be located on expansive soil, as defined in Table 18-1-B of the California Building Code (2004), creating substantial risks to life or property?

Less Than Significant Impact. Clayey loams are often classified as expansive soils, meaning they can have a moderate to high shrink-swell potential. According to the City's *General Plan*, the project site is located with soil profile "B", which are lowlying areas that represent channels that were cut deeply into the uplifted marine sediments by ancestral rivers. Over the last 17,000 years, the rivers have filled these channels to their present level with relatively unconsolidated sediments. The cohesionless soils consist generally of silty sand and sandy silt and are typically loose to medium dense. Although the project area may contain expansive soils, the proposed project would not pose substantial risk to people or property, as the project encompasses underground storm drain improvements and detention unit. Implementation of Mitigation Measure GEO-1 would reduce impacts associated with expansive soils to less than significant levels.

Mitigation Measures: Refer to Mitigation Measure GEO-1.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The project involves improvements to the existing storm drain system along River Avenue and the construction of a detention unit within the SCE property. The project would not involve the use of septic tanks or alternative wastewater disposal systems. Therefore, no impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

4.7 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		✓		
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			✓	
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				✓
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				✓
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				✓
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			✓	
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				✓

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact. The proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. With the exception of utilizing gasoline and diesel fuels in the construction equipment, no other hazardous materials would be transported to or from the project site, or used in the construction process. Fuels and solvents would be stored and utilized pursuant to Best Management Practices. Also, long-term operations of the proposed project would encompass underground storm drain piping and an underground detention unit. Therefore, no impacts would occur in this regard.

Mitigation Measures: No mitigation measures are required.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less Than Significant Impact With Mitigation Incorporated. The proposed project is unlikely to result in a release of hazardous materials into the environment. However, during the short-term period of project construction, there is a possibility of accidental release of hazardous substances such as petroleum-based fuels or hydraulic fluid used for construction equipment. The level of risk associated with the accidental release of hazardous substances is not considered significant due to the small volume and low concentration of hazardous materials utilized during construction. The construction contractor would be required to use standard construction controls and safety procedures that would avoid and minimize the potential for accidental release of such substances into the environment. Standard construction practices would be observed such that any materials released are appropriately contained and remediated as required by local, State, and Federal law. Impacts are less than significant in this regard.

The Phase I Environmental Site Assessment (Phase I ESA) prepared for the project by Kleinfelder on May 16, 2008 (refer to Appendix C, *Phase I Environmental Site Assessment*), identified the possibility of pesticide use at the nursery on the SCE property as a potential recognized environmental condition (REC). Additionally, the Phase I ESA also identified the possibility of a leak along a petroleum pipeline (along River Avenue and within the footprint of the proposed detention unit on the SCE property) as a potential REC.

Due to the identification of two potential RECs at the project site, mitigation has been recommended per the Phase I ESA. Mitigation Measure HAZ-1 recommends further investigation of the possibility of pesticide use at the SCE property, while Mitigation Measure HAZ-2 provides for the identification of the exact locations of the petroleum pipelines within the project site. With the implementation of Mitigation Measures HAZ-1 and HAZ-2, impacts in this regard would be less than significant.

Mitigation Measures:

HAZ-1 Prior to construction activities, an Environmental Professional shall conduct Phase II sampling on the Southern California Edison property within the area of disturbance to confirm or deny the presence of pesticides. Should sampling deny the presence of pesticides, sampling procedures would be deemed complete. Should sampling confirm the presence of pesticides, the Environmental Professional shall recommend further site characterization and/or remedial actions, if necessary.

HAZ-2 Prior to construction activities, the exact location of petroleum pipelines along River Avenue and within the footprint of the proposed detention unit on the Southern California Edison property shall be identified. The City of Long Beach shall confirm the locations with the following petroleum pipeline owners: ConcoPhillips, Defense Energy Support Center, Kinder Morgan, Pacific Pipeline System, and Paramount.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less Than Significant Impact. The proposed project would not result in hazardous emissions or acutely hazardous materials that would pose a potential health hazard. The only emissions that would occur are those resulting from the use of heavy equipment required for construction. However, these emissions would be primarily composed of particulates and criteria air pollutants that do not pose a significant health risk (refer to Section 4.7, *Air Quality*). Also, no schools are located within one-quarter mile of the project site. The nearest school to the project site is Webster Elementary School, located approximately 0.42-miles to the southeast. No toxic or hazardous materials would be utilized within the vicinity of the school. Therefore, no significant impacts would occur as a result of project implementation.

Mitigation Measures: No mitigation measures are required.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. There are no habitable structures located within the project site. Therefore, as the proposed project is located within public rights-of-way, the project site is not listed in a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Additionally, according to the Phase I ESA, the project site was not listed in federal databases searched by Environmental Data Resources, Inc. Therefore, no impact would result in this regard.

Mitigation Measures: No mitigation measures are required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The nearest public airport (Long Beach Municipal Airport) is located greater than two miles east of the project site. Therefore, no safety hazard would result from project implementation. No impact would occur in this regard.

***Mitigation Measures*:** No mitigation measures are required.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The project site is not located within the vicinity of a private airstrip or related facilities. Therefore, no impacts would occur in this regard.

***Mitigation Measures*:** No mitigation measures are required.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. The City's Natural Hazards Mitigation Plan (October, 2004) includes resources and information to assist residents and others interested in participating in planning for natural hazards. The plan provides a list of activities that may assist the City in reducing risk and preventing loss from future natural hazard events. The plan addresses multi-hazard issues, earthquakes, flooding, earth movement, windstorms, and tsunamis. The Long Beach Department of Emergency Preparedness is located approximately 4.4 miles east of the project site, at 4040 East Spring Street near the airport (location of the Emergency Operations Center [EOC]). This underground facility would serve as the command post for coordinating manpower, equipment, resources, and facilities. The nearest emergency shelter to the project site is located near the intersection of Santa Fe Avenue and West Willow Street (approximately 1.2 miles southeast of the project site).

Evacuation procedures, in the event of a disaster, would need to be coordinated through the Police Department. The City has not established evacuation routes, as the areas affected by disaster would vary. However, critical points throughout the City would be identified (including major arterials and traffic interchanges) and teams of police personnel would be assigned to patrol major evacuation points. The nearest major intersection to the project site is the Santa Fe Avenue/West Wardlow Road intersection, located approximately 0.40 miles east of the project site. It is anticipated that traffic flow along River Avenue would be temporarily impacted during construction of the proposed improvements. However, during construction of the proposed project would not obstruct emergency operations. Upon completion of construction, operation of the project would not obstruct traffic flow or emergency operations. Additionally, the project would be required to comply with all City and State Safety Codes, and project plans would be reviewed by the City's Public Works Department. Therefore, impacts associated with the Natural Hazards Mitigation Plan and emergency operations would be considered less than significant.

Mitigation Measures: No mitigation measures are required.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. The proposed project would not expose people or structures to fire hazards, as the project site is not in a high fire hazard area nor adjacent to any wildlands. According to the Public Safety Element of the *General Plan*, the project site is located in an area of the City categorized as a "least critical" fire hazard area. The nearest critical fire hazard area to the project site is approximately 0.50 miles south of the project site. Therefore, no impacts would occur in this regard.

Mitigation Measures: No mitigation measures are required.

4.8 HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?			✓	
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				✓
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				✓
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				✓
e. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?				✓
f. Otherwise substantially degrade water quality?			✓	
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				✓
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				✓
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				✓
j. Inundation by seiche, tsunami, or mudflow?				✓

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant Impact. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. The NPDES permit program is administered by the California Regional Water Quality Control Board (RWQCB). There are nine RWQCBs, which are responsible for development and enforcement of water quality objectives and implementation plans. The project site is located in the jurisdiction of the Los Angeles RWQCB.

Impacts related to water quality would range over three different periods: 1) during the earthwork and construction phase, when the potential for erosion, siltation, and sedimentation would be the greatest; 2) following construction, prior to the establishment of ground cover, when the erosion potential may remain relatively high; and 3) following completion of the project, when impacts related to sedimentation would decrease markedly, but those associated with urban runoff would increase.

Short-Term Construction

A Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP is required to contain a site map(s) that depicts the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project site. The SWPPP must list Best Management Practices (BMPs) the discharger would use to protect storm water runoff and the placement of those BMPs. BMPs for construction activities may include measures to control pollutants at particular sources, such as fueling areas, trash storage areas, outdoor materials storage areas, and outdoor work areas. BMPs are also used during treatment of the pollutants at these particular source areas.

In addition to the BMPs, the SWPPP must contain: a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Section A of the Construction General Permit describes the elements that must be contained in an SWPPP.

Construction activities associated with the proposed project have the potential to produce typical pollutants such as nutrients, heavy metals, toxic chemicals, waste materials including wash water, paints, wood, concrete, sanitary wastes, fuel, and lubricants. Impacts to storm water quality may occur from construction and associated earth moving, and increased pollutant loadings would occur immediately off-site.

The proposed project would require disturbance of 0.12-acres of land. However, should the proposed area of disturbance to be constructed at one time and over one acre of land is disturbed, coverage under the General Permit would be required.

With adherence to standard construction measures, the project would be required to obtain applicable permits from the RWQCB pertaining to waste discharge requirements and dewatering activities (if anticipated). At this time, the City would be required to submit a Notice of Intent (NOI) prior to construction activities, and then prepare, have on site, and conform to an SWPPP during construction. Following compliance with the applicable permits from the RWQCB, project implementation would not violate any water quality standards or waste discharge requirements associated with construction activities.

Long-Term Operations

The primary objectives of the municipal storm water program requirements are to effectively prohibit non-storm water discharges and to reduce the discharge of pollutants from the storm water conveyance system to the "Maximum Extent Practicable." The RWQCB has adopted a Water Quality Control Plan, which contains prohibitions, water quality standards, and policies for implementation of standards.

Major drainage channels in Long Beach drain into the Los Angeles River, San Gabriel River, and Long Beach Harbor. The project proposes improvements to the existing storm drain system. Operation of the project would not result in long-term water quality impacts. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

No Impact. Project implementation would not create a demand for water in excess of available supplies, resulting in depletion of groundwater supplies. The project would not result in an increase of impervious surfaces from existing site conditions. Also, the project is not anticipated to impact groundwater. Therefore, project implementation would not deplete groundwater supplies or interfere with groundwater recharge.

Mitigation Measures: No mitigation measures are required.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

No Impact. The proposed project would not alter the existing drainage pattern. The nearest water course to the project site is the Dominguez Channel, located approximately 0.63 miles to the southwest; also, the Los Angeles River is located approximately 0.95 miles to the east. Runoff in the project area would be similar to existing conditions, except during large storm events, in which case flooding would be alleviated. The River Avenue storm drain system outlets approximately 0.7 miles southwest of the project site into the Dominguez Channel. Upon completion of construction, the storm drain system's ultimate outlet would not change. Due to the paved nature of the project site, erosion or siltation on- or off-site would not occur. Erosion or siltation at the SCE property would remain similar to existing conditions. Therefore, no impact would result in this regard.

Mitigation Measures: No mitigation measures are required.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

No Impact. Refer to Response 4.8(c). Also, project implementation would alleviate existing flooding within and surrounding the project site. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

No Impact. The existing drainage system does not adequately accommodate the storm water flows of the project area. Based on 2005 hydrologic conditions, the catch basins along River Avenue are restricted and collect only 65 cubic feet per second (cfs); however, the flow rate for the mainline along River Avenue is 105 cfs. Therefore, the excess surface flow of approximately 40 cfs, that is not accommodated by the drainage system, flows onto adjacent residential properties, along Arlington Street.

The project proposes to bring the flood protection level in the area to a full 10 year protection level. To accommodate a 10 year protection level, the project proposes a new 48-inch RCP along River Avenue, modification of existing catch basins, construction of new catch basins, and construction of an underground detention unit within the SCE easement. The proposed improvements would adequately accommodate existing runoff and prevent future flooding. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

f) Otherwise substantially degrade water quality?

Less Than Significant Impact. Implementation of the proposed project would not affect the water quality in the area, as the project would increase storm drainage capacity and not result in any new sources of runoff. The project may include dewatering activities during construction. Per applicable RWQCB permit(s), all of the water that would be pumped during construction would be treated prior to discharge. The project would not otherwise substantially degrade water quality. With implementation of standard construction measures, impacts in this regard are considered to be less than significant. Refer to Response 4.8(a) and 4.8(b) above.

Mitigation Measures: No mitigation measures are required.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. Project implementation would not place housing or habitable structures within a 100-year flood hazard area. According to the Public Safety Element of the *General Plan*, the project site is located within one of the 19 flood hazard areas within the City, based on a 10-year recurrence probability. Implementation of the proposed project would alleviate flooding hazards in the project area during a 10-year storm event. No impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

No Impact. As stated in Response 4.8(g), no structures are proposed within any designated 100-year flood hazard area as identified by FEMA or the by the City. The proposed storm drain improvements are intended to alleviate existing storm drain deficiencies and provide adequate storm runoff collection in the project area. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

No Impact. Refer to Response 4.8(g) and 4.8(h). The proposed project does not involve permanent habitable structures. The proposed pipelines and detention unit would be located underground and would not expose people to significant risk. Project implementation would not expose people or structures to significant risk of loss, injury, or death involving flooding. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

j) Inundation by seiche, tsunami, or mudflow?

No Impact. The project site is located approximately 0.63 miles northeast of the Dominguez Channel, approximately 0.95 miles west of the Los Angeles River, and approximately 4.5 miles north of the Long Beach Harbor. According to the Seismic Hazards Element of the *General Plan,* tsunami and seiche influence areas are concentrated along the coastline. Therefore, the chance of inundation by tsunami or seiche affecting the project site appears to be low. Also, the project site is not located down-slope from an area of potential mudflow. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

This page intentionally left blank.

4.9 LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Physically divide an established community?				✓
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			✓	
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?				✓

a) Physically divide an established community?

No Impact. The existing storm drain facilities are located underground within River Avenue and the SCE property. The proposed project involves improvements to the existing storm water facilities, including new pipelines and an underground detention unit within the SCE property, and does not propose any new development. As the project would not physically divide an established community, no impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less Than Significant Impact. Implementation of the proposed improvement activities would not conflict with the roadway designation of River Avenue or the land use designation of the SCE property. No impact would occur in this regard.

The project site is located within an existing roadway which is not applicable to zoning designations. The project site also consists of an SCE easement, which is zoned PR (Public Right-of-Way) and permits utility uses. As a result, the proposed project would not require zone changes and would not result in an impact in this regard.

Mitigation Measures: No mitigation measures are required.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. The project site is not located within the jurisdiction of a habitat conservation plan or natural community conservation plan; refer also to Response 4.4(f). Therefore, project implementation would not conflict with any applicable habitat conservation plan or natural community conservation plan.

Mitigation Measures: No mitigation measures are required.

4.10 MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				✓
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				✓

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The project site currently consists of River Avenue and a portion of an SCE easement, and does not contain any known mineral resources. The land uses surrounding the project site consist of residential, utility, and industrial (i.e., railroad uses). According to the City's *General Plan,* oil deposits are abundant in the City tidelands area. Known mineral resources in the City are concentrated within the Wilmington Oil Field, located approximately 1.50 miles south of the project site. Therefore, project implementation would not result in the loss of availability of a known mineral resource of value. No impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. Refer to Response 4.10(a).

Mitigation Measures: No mitigation measures are required.

This page intentionally left blank.

4.11 NOISE

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		✓		
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?		✓		
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		✓		
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				✓
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				✓

Noise is generally defined as unwanted or excessive sound, which can vary in intensity by over one million times within the range of human hearing; therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity. Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks, and airplanes, and stationary sources such as construction sites, machinery, and industrial operations.

Two of the primary factors that reduce levels of environmental sounds are increasing the distance between the sound source to the receiver and having intervening obstacles such as walls, buildings, or terrain features between the sound source and the receiver. Factors that act to increase the loudness of environmental sounds include moving the sound source closer to the receiver, sound enhancements caused by reflections, and focusing caused by various meteorological conditions.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (Environmental Protection Agency) offers guidelines for community noise exposure in the publication *Noise Effects Handbook*. The guidelines consider occupational noise exposure as well as noise exposure in homes. The Environmental Protection Agency recognizes an exterior noise level of 55 decibels day-night level dBA L_{dn} as a general goal to protect the public from hearing loss, activity interference, sleep disturbance, and annoyance. The Environmental Protection Agency and other Federal agencies have adopted suggested land use compatibility guidelines that indicate that residential noise exposures of 55 dBA L_{dn} to 65 dBA L_{dn} are acceptable.

State of California

The State Office of Planning and Research *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The *Noise Element Guidelines* contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the Community Noise Equivalent Level (CNEL). A noise environment of 50 CNEL to 60 CNEL is considered to be of "normally acceptable" for residential uses. The Office of Planning and Research recommendations also note that, under certain conditions, more restrictive standards than the maximum levels cited may be appropriate. As an example, the standards for quiet suburban and rural communities may be reduced by 5 dBA CNEL to 10 dBA CNEL to reflect their lower existing outdoor noise levels in comparison with urban environments.

City of Long Beach

Chapter 8.80, *Noise,* of the City of Long Beach *Municipal Code* sets forth all noise regulations controlling unnecessary, excessive, and annoying noise and vibration in the City. As outlined in Chapter 8.80.150 of the *Municipal Code* and as indicated in Table 4.11-1, *Exterior Noise Limits*, maximum exterior noise levels are based on land use districts. The *Municipal Code*, Chapter 8.80, states the following:

A. The noise standards for the various land use districts identified by the noise control office as presented in Table A in Section 8.80.160 (Table 4.11-1) *shall, unless otherwise specifically indicated, apply to all such property within a designated district.*

B. No person shall operate or cause to be operated any source of sound at any location within the incorporated limits of the city or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured from any other property, either incorporated or unincorporated, to exceed:

1. The noise standard for that land use district as specified in Table A in Section 8.80.160 (Table 4.11-1) *for a cumulative period of more than thirty minutes in any hour; or*

2. The noise standard plus five decibels for a cumulative period of more than fifteen minutes in any hour; or

3. The noise standard plus ten decibels for a cumulative period of more than five minutes in any hour; or

4. The noise standard plus fifteen decibels for a cumulative period of more than one minute in any hour; or

5. The noise standard plus twenty decibels or the maximum measured ambient, for any period of time.

C. If the measured ambient level exceeds that permissible within any of the first four noise limit categories in subsection B of this section, the allowable noise exposure standard shall be increased in five decibels increments in each category as

appropriate to encompass or reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category in subsection B of this section, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

Table 4.11-1
Exterior Noise Standards

Receiving Land Use District	Noise Level	Time Period
1 - Residential	50 db(A)	7:00 a.m. – 10:00 p.m.
	45 db(A)	10:00 p.m. – 7:00 a.m.
2 – Commercial Properties	60 db(A)	7:00 a.m. – 10:00 p.m.
	55 db(A)	10:00 p.m. – 7:00 a.m.
3 – Industrial Properties	65 db(A)	Any time
4 – Industrial Properties	70 db(A)	Any time
Source: City of Long Beach, *City of Long Beach Municipal Code*, April 2009.		

Additionally, the *Municipal Code*, Chapter 8.80.170, states the following regarding interior noise standards:

A. The interior noise standards for various land use districts as presented in table C (Table 4.11-2) shall apply, unless otherwise specifically indicated, within structures located in designated zones with windows in their normal seasonal configuration.

B. No person shall operate, or cause to be operated, any source of sound indoors at any location within the incorporated limits of the city or allow the creation of any indoor noise which causes the noise level when measured inside the receiving dwelling unit to exceed:

1. The noise standard for that land use district as specified in table C (Table 4.11-2) for a cumulative period of more than five (5) minutes in any hour; or

2. The noise standard plus five decibels (5 dB) for a cumulative period of more than one minute in any hour; or

3. The noise standard plus ten decibels (10 dB) or the maximum measured ambient, for any period of time.

C. If the measured indoor ambient level exceeds that permissible within any of the first two (2) noise limit categories in this section, the allowable noise exposure standard shall be increased in five decibel (5 dB) increments in each category as appropriate to reflect the indoor ambient noise level. In the event the indoor ambient noise level exceeds the third noise limit category, the maximum allowable indoor noise level under said category shall be increased to reflect the maximum indoor ambient noise level.

Table 4.11-2
Interior Noise Standards

Land Use District	Noise Level	Time Period
All – residential	45 db(A)	7:00 a.m. – 10:00 p.m.
	35 db(A)	10:00 p.m. – 7:00 a.m.
All – school	45 db(A)	7:00 a.m. – 10:00 p.m.
Hospital, designated quiet zones, and noise sensitive areas	40 db(A)	Any time

Source: City of Long Beach, *City of Long Beach Municipal Code*, April 2009.

In addition, the City provides exemptions of the noise standards for street sales, animals and birds, stationary non-emergency signaling devices, emergency signaling devices, domestic power tools, air conditioning or air refrigerating equipment, and refuse collection vehicles. The City also includes an exemption in Section 8.80.330 of the *Municipal Code* for public health, safety, and welfare activities as follows:

> *The provisions of this chapter shall not apply to construction maintenance and repair operations conducted by public agencies and/or utility companies or their contractors which are deemed necessary to serve the best interests of the public and to protect the public health, welfare and safety, including, but not limited to, street sweeping, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catchbasins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, sidewalks, etc.*

Noise Measurements

In order to quantify existing ambient noise levels in the proposed project area, RBF Consulting conducted one ten-minute (12:53 p.m. to 1:03 p.m.) noise measurement within the residential uses along River Avenue near Lincoln Street on June 16, 2009. The measured noise level was 57.8 dBA. The complete result of the field measurement is included in *Appendix E*, *Noise Data*.

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact with Mitigation Incorporated. As stated above, Chapter 8.80, *Noise*, of the City's *Municipal Code* sets forth all noise regulations controlling unnecessary, excessive, and annoying noise and vibration in the City. As outlined in *Municipal Code* Section 8.80.150, maximum exterior and interior noise levels are based on land use.

Short-Term Noise Impacts

Construction activities generally are temporary and have a short duration. Groundborne noise and other types of construction-related noise impacts would typically occur during the initial site preparation, which can create the highest levels

of noise. Generally, site preparation has the shortest duration of all construction phases. Activities that occur during this phase include earth moving and soils compaction. High groundborne noise levels and other miscellaneous noise levels can be created during this phase by the operation of heavy-duty equipment.

In addition to construction noise from the project site, increased noise would occur along access routes to the sites due to movement of equipment and workers. The project anticipates the construction of proposed improvements to take place over three months. Project construction activities entail demolition of roadway asphalt, excavation of trenches, placement of pipe, backfill and compaction, and re-paving the disturbed area. Temporary construction noise impacts vary because the acoustical intensity of the construction equipment ranges widely as a function of the equipment used and its activity level. The demolition and trenching sources are the noisiest with equipment noise typically ranging from 75 to 90 dB at 50 feet from the source. The loudest activities would occur for only a few days near any individual receiver because of the progressive nature of the project.

A reasonable worst-case assumption is that the three loudest pieces of equipment would operate simultaneously within a focused area and continuously over at least one hour. Table 4.11-3, *Maximum Noise Levels Generated By Construction Equipment*, identifies noise levels for each piece of equipment.

In order to estimate the "worst case" construction noise levels that may occur at an existing noise-sensitive receptor, the combined construction equipment noise levels have been calculated for the demolition, trenching, and paving phases. The demolition and trenching phases would include mostly site preparation activities. Construction equipment utilized during these phases would include tractors, loaders, concrete saw, bulldozer, and excavators. The paving phase would involve construction and asphalt laydown activities which would utilize cement mixers, backhoe, paver, and a roller.

Table 4.11-3
Maximum Noise Levels Generated by Construction Equipment

Type of Equipment	Acoustical Use Factor[1]	L_{max} at 50 Feet (dBA)
Concrete Saw	20	90
Concrete Mixer Truck	40	79
Backhoe	40	78
Dozer	40	82
Excavator	40	81
Paver	50	77
Roller	20	80
Tractor	40	84
General Industrial Equipment	50	85

Note:
1. Acoustical Use Factor (percent): Estimates the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

Source: Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006; refer to *Appendix E*, *Noise Data*.

Operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. The primary sources of acoustical disturbance would be random incidents, which would last less than one minute, such as dropping large pieces of equipment or the hydraulic movement of machinery lifts. These estimations of noise levels take into account the distance to the receptor, attenuation from molecular absorption and anomalous excess attenuation.

Actual construction-related noise activities would be lower than these conservative rates and would cease upon completion of construction. The City's Noise Ordinance, of the *Municipal Code*, stipulates that noise generated from construction activities is exempted from the Noise Ordinance requirements between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and between 9:00 a.m. and 6:00 p.m. on Saturdays. Construction is not permitted on Sundays. Additionally, Section 8.80.330 of the *Municipal Code* contains an exemption from the Noise Ordinance for public health, safety, and welfare activities. The project proposes improvements that would alleviate flooding hazards to surrounding residents within the Arlington neighborhood. Implementation of the recommended Mitigation Measure N-1 would ensure construction related noise impacts are minimized to the extent feasible. As such, with implementation of N-1 and compliance with the City's *Municipal Code*, Title 8, Health and Safety, construction noise impacts would be less than significant.

Mitigation Measures:

N-1 Prior to site mobilization, a construction management plan shall be prepared which includes the following:

- All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers;
- Construction noise reduction methods such as shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment, shall be used where feasible;
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers;
- During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors;
- Operate earthmoving equipment on the construction site, as far away from vibration sensitive sites as possible; and
- Property owners and occupants located within 100 feet of the project boundary shall be sent a notice, at least 15 days prior to commencement of construction of each phase, regarding the construction schedule of the proposed project. A sign, legible at a distance of 50 feet shall also be

posted at the project construction site. All notices and signs shall indicate the dates and duration of construction activities, as well as provide a contact name and a telephone number where residents can inquire about the construction process and register complaints.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impacts with Mitigation Incorporated.

Project construction can generate varying degrees of ground-borne vibration, depending on the construction procedure and the construction equipment used. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Ground-borne vibrations from construction activities rarely reach levels that damage structures.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.20 inch/second) appears to be conservative. The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Typical vibration produced by construction equipment is illustrated in Table 4.11-4, *Typical Vibration Levels for Construction Equipment*.

Table 4.11-4
Typical Vibration Levels for Construction Equipment

Equipment	Approximate peak particle velocity at 25 feet (inches/second)	Approximate peak particle velocity at 75 feet (inches/second)
Loaded trucks	0.076	0.015
Small bulldozer	0.003	0.001
Jackhammer	0.035	0.007
Vibratory hammer	0.035	0.007
Notes: 1. Peak particle ground velocity measured at 25 feet unless noted otherwise. 2. Root mean square amplitude ground velocity in decibels (VdB) referenced to 1 micro-inch/second.		
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006.		

Ground-borne vibration decreases rapidly with distance. As indicated in Table 4.11-4, based on the FTA data, vibration velocities from typical heavy construction equipment operations that would be used during project construction range from 0.003 to 0.076 inch-per-second peak particle velocity (PPV) at 25 feet from the source of activity. At 75 feet from the source of activity, vibration velocities range from 0.001 to 0.015 inch-per-second PPV. With regard to the proposed project, ground-borne vibration would be generated primarily during site clearing and demolition activities on-site and by off-site haul-truck travel.

The PPV from bulldozer and heavy truck operations is shown to be 0.089 inch-per-second PPV and 0.076 inch-per-second PPV, respectively, at a distance of 25 feet. Sensitive receptors in the project area range from approximately 12 to 100 feet from an active construction zone. Vibration from construction activities experienced at the nearest sensitive residential uses is expected to be below the 0.20 inch-per-second PPV significance threshold. Therefore, a less than significant impact would occur in this regard.

Mitigation Measures: Refer to Mitigation Measure N-1. No additional mitigation measures are required.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact.

Long-Term Mobile Noise Impacts

The project proposes improvements to the storm drain system along River Avenue and the construction of an underground detention unit, which would not generate any new vehicular trips. Thus a less than significant impact would result in this regard.

Long-Term Stationary Noise Impacts

Upon project completion, noise in the project area would remain similar to existing noise levels. The proposed facilities would not involve any sources of stationary noise (i.e., pumps, generators, etc.). Therefore, no impact would result in this regard.

Mitigation Measures: No mitigation measures are required.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact With Mitigation Incorporated. Refer to Responses 4.8(a) and 4.8(b).

Mitigation Measures: Refer to Mitigation Measures N-1. No additional mitigation measures are required.

e) ***For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?***

No Impact. The project site is not located within an airport land use plan and not within two miles of a public airport or public-use airstrip. The Long Beach Municipal Airport is located approximately 3.4 miles east of the project site. According to the Noise Element of the *General Plan*, areas exposed to aircraft noise of CNEL 65 and higher are limited to within an approximate one mile radius of the airport. Implementation of the proposed project would not expose new residential or commercial uses to excessive noise levels associated with the operation of a public airport or private airstrip. Therefore, the proposed project would not expose people to excessive noise levels and no impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

f) ***For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?***

No Impact. Refer to Response 4.11(e).

Mitigation Measures: No mitigation measures are required.

This page intentionally left blank.

4.12 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				✓
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				✓
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✓

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. Project implementation would only include the proposed infrastructure improvements along River Avenue, from Wardlow Avenue to the SCE easement. No residential or occupied structures are proposed. The proposed project is intended to alleviate current flooding hazards as a result of the existing deficient storm drainage system. The proposed project would not result in population growth within the City either directly or indirectly. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The project would not impact the existing structures in the project area or displace any existing housing in the area. Therefore, no impacts would occur in this regard.

Mitigation Measures: No mitigation measures are required.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. Refer to Response 4.12(a) and 4.12(b).

Mitigation Measures: No mitigation measures are required.

This page intentionally left blank.

4.13 PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
1) Fire protection?			✓	
2) Police protection?				✓
3) Schools?				✓
4) Parks?				✓
5) Other public facilities?				✓

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

1) Fire protection?

Less Than Significant Impact. The Long Beach Fire Department (LBFD) provides fire protection and emergency response to the City. Twenty-five fire stations serve the City. LBFD headquarters is located at 3205 Lakewood Boulevard, approximately 4.8-miles east of the project site. The nearest is Fire Station 13 located at 2475 Adriatic Avenue, approximately 1.40-miles southeast of the project site. The project would not result in adverse impacts to fire services. During construction, access throughout the project area may be limited. However, LBFD would require standard conditions of approval, which would ensure that access to fire trucks is not impeded in the project vicinity.

Mitigation Measures: No mitigation measures are required.

2) Police protection?

No Impact. The City of Long Beach Police Department (LBPD) provides police protection to the City. The police station headquarters is located at 400 West Broadway, approximately 3.9-miles southeast of the project site. As the project consists of storm drain improvements, the proposed project does not include uses that would require additional police services or facilities. Therefore, no impacts would occur in this regard.

Mitigation Measures: No mitigation measures are required.

3) Schools?

No Impact. The project would not generate an increase in population or student generation, and would not result in impacts to school services.

Mitigation Measures: No mitigation measures are required.

4) Parks?

No Impact. Parks within the City would not be physically modified as part of the project. Therefore, project implementation would not result in substantial adverse physical impacts associated with parks or recreational facilities. No impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

5) Other public facilities?

No Impact. Project implementation would not increase the number of persons at the project site and would not result in an increase in the demand for other governmental agencies or facilities. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

4.14 RECREATION

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				✓
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				✓

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Impact. There are 92 parks located within the City, encompassing 1,413 acres. The park nearest to the project site is Silverado Park, located approximately 0.60-miles to the southeast. The project improvements would not generate new residents within the City. Therefore, the project would not increase the use of existing neighborhood and regional parks or require the construction or expansion of recreational facilities. No impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. Refer to Response 4.14(a).

Mitigation Measures: No mitigation measures are required.

This page intentionally left blank.

4.15 TRANSPORTATION/TRAFFIC

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			✓	
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			✓	
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				✓
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				✓
e. Result in inadequate emergency access?			✓	
f. Result in inadequate parking capacity?			✓	
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				✓

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

Less Than Significant Impact. The proposed project would only generate traffic trips during short-term construction activities. A minimal number of construction trips would be necessary for project implementation. Approximately 2.3 truck trips would be required for the hauling of demolished asphalt materials (approximately 46.3 cubic yards) to the disposal site. Also, approximately 4,500 cubic yards of soil would be excavated and deposited on the SCE property. This would require 225 truck trips to the adjacent SCE property. The remainder of construction trips would be construction worker trips to and from the project site each day of construction. Roadways would be partially blocked off during construction activities; however, they would remain accessible with standard traffic control devices. Long-term operation of the proposed project would not generate traffic trips, as the project consists of underground storm drain improvements. Therefore, impacts in this regard would be less than significant.

Mitigation Measures: No mitigation measures are required.

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Less Than Significant Impact. The proposed project would not create any new traffic trips other than the minimal number associated with the short-term construction period. The project would not increase the population within the City and would not cause a significant exceedance in the existing level of service. The Transportation Element of the *General Plan* establishes Level of Service (LOS) D as being the acceptable LOS standard. The *General Plan* identifies several roadways that are congested. However, none of these roadways traverse through the project limits. The proposed project would not result in additional traffic trips upon completion of construction and would not exceed an established LOS. Therefore, impacts in this regard are less than significant.

Mitigation Measures: No mitigation measures are required.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. The Long Beach Municipal Airport is located approximately 3.4 miles east of the project site. Construction or the operation of the project would not increase the frequency of air traffic or alter air traffic patterns. Therefore, no impacts would occur in this regard.

Mitigation Measures: No mitigation measures are required.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. The project would not alter the existing lane configurations or curb lines along River Avenue. All proposed improvements would be underground or within curb and gutter areas of River Avenue. In areas where trenching would occur, River Avenue would be rehabilitated to its pre-construction condition. Therefore, no impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

e) Result in inadequate emergency access?

Less Than Significant Impact. Traffic flow in the project area would be temporarily impacted during construction. However, construction of the proposed improvements would not obstruct emergency operations or access. Upon completion, operation of the project would not obstruct traffic flow or emergency operations. Additionally, the project would be required to comply with all City and State Safety Codes, and project plans would be reviewed by the City's Public Works Department. Additionally, refer to Response 4.7(g). Impacts in this regard are less than significant.

Mitigation Measures: No mitigation measures are necessary.

f) Result in inadequate parking capacity?

Less Than Significant Impact. The project would not generate an increase in population, and therefore would not cause a decrease in parking capacity. No additional parking would be necessary with implementation of the proposed project.

Street parking during short-term construction may be affected; however, this would be temporary and would cease upon completion of construction. Additionally, as stated in Section 2.4, *Project Description*, a traffic control plan would be prepared for the project which would include specifics on potential detours, flagmen, and temporary "no parking" areas. Impacts in this regard are less than significant.

Mitigation Measures: No mitigation measures are required.

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

No Impact. Transit services within the City are provided by Long Beach Transit (fixed-route bus service), Los Angeles County Metropolitan Transportation Authority (bus transit and the Metro Blue Line), Orange County Transportation Authority, Torrance Transit, and the Commuter Express operated by the City of Los Angeles Department of Transportation. The nearest transit stop to the project site is the Long Beach Transit Bus Routes 191 and 193 stop located at the intersection of Wardlow Road/223rd Street and McHelen Avenue (approximately 175 feet north of River Avenue). This transit stop is not located within an improvement area and would not be affected by short-term construction activities or long-term operations.

The City adopted the Bicycle Master Plan in December 2001. Bikeways within the City include Class I, Class II, and Class III bikeways. There are no bikeways located within the project site. The nearest bikeway to the project site is a Class I bikeway along the Los Angeles River, approximately 0.93 miles to the east. No bikeways within the City would be affected during short-term construction.

Long-term operation of the proposed project would not conflict with any policies, plans, or programs supporting alternative transportation. Construction activities would be short-term and would not affect transit routes or bikeways. Therefore, no impacts would result in this regard.

Mitigation Measures: No mitigation measures are required.

This page intentionally left blank.

4.16 UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				✓
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			✓	
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				✓
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			✓	
g. Comply with federal, state, and local statutes and regulations related to solid waste?			✓	

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

No Impact. The Los Angeles Regional Water Quality Control Board (RWQCB) protects ground and surface water quality within the project area. The RWQCB has adopted National Pollutant Discharge Elimination System (NPDES) Permits and Waste Discharge Requirements (WDRs), which regulate discharges into the City's water supply. The proposed project would be required to comply with the conditions of the NPDES permit, both during construction activities and during operations. The project would not include any development that would generate an increase in population causing an exceedance in wastewater treatment requirements. Therefore, no impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. The proposed project would not require the construction of new water or wastewater treatment facilities. Therefore, no impact would result in this regard.

Mitigation Measures: No mitigation measures are required.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. The proposed project would involve improvements to the currently deficient storm water drainage system to bring the system to a full 10-year flood protection level. The project involves the construction of 1,021 feet of 48-inch RCP along River Avenue, modification of five catch basins, construction of six new catch basins, and construction of a detention system of five 84-inch (430 feet in length) underground pipelines. The ultimate outlet of the system would not be modified. The proposed improvements would alleviate current, and prevent future flooding hazards due to the heavy amount of storm water flow in the area, and would not result in increased sources of storm water. The project is located within a currently paved roadway with improved curbs and gutters. After project implementation, paved roadways, curbs, and gutters would remain. Improvements within the SCE property would remain unpaved. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures are required.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less Than Significant Impact. The proposed project would not create an increase in population, as the project would involve improvements to the existing storm drain system. Therefore, project operations would not require water supplies beyond those typically required during standard construction practices. Impacts in this regard are less than significant.

Mitigation Measures: No mitigation measures are required.

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. Refer to Response 4.16(b).

Mitigation Measures: No mitigation measures are required.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Less Than Significant Impact. Solid waste from the project that cannot be recycled or reduced would be disposed of in two ways. Most trash in the City is taken to the Southeast Resource Recovery Center (SERRF) to be incinerated and converted to electricity. The residue from this process is taken to landfills to be used as road base. The remainder of the City's trash is taken to the Puente Hills Landfill in the City of Whittier. The Puente Hills Landfill has a total permitted capacity of 106.4 million cubic yards, of which 49.4 million cubic yards is the remaining capacity. The

landfill is anticipated to close in 2013.[1] Additionally, the City has implemented a Construction and Demolition Recycling program (Section 18.97 of the *Municipal Code*) that requires certain demolition and/or construction projects to divert at least 60 percent of waste from landfills through recycling, salvage, or deconstruction.

Solid waste (including recycled materials) in the area is handled and transported by the City's Refuse Collection Division. The proposed project is anticipated to generate solid waste only during construction. Construction and demolition materials associated with asphalt removal would either be recycled or disposed of in the Puente Hills Landfill. The project would not significantly increase the amount of solid waste generated by the City. Therefore, a less than significant impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Less Than Significant Impact. The proposed project would be in full compliance with Federal, State, and local regulations in regards to solid waste. As stated in Response 4.16(f), solid waste generated from construction of the proposed project would either be recycled, or disposed of in the Puente Hills Landfill (which is fully permitted to receive such solid waste). A less than significant impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

[1] Solid Waste Facility Listing: http://www.ciwmb.ca.gov/Swis/search.aspx, July 2009.

This page intentionally left blank.

4.17 MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				✓
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			✓	
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		✓		

a) ***Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?***

No Impact. The project site is not located within any habitat areas of the City according to Figure 5, Habitats, of the Conservation Element of the *General Plan*. The nearest habitat location is approximately 0.95 miles east within the Los Angeles River. The proposed areas for improvement have no potential to support State- or Federally-listed special status plant or wildlife species and no focused surveys for any special status species are required. Therefore, the proposed project would not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

b) ***Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?***

Less Than Significant Impact. Due to the nature of the proposed project (i.e., storm drain improvements), implementation would not involve significant cumulative impacts. Project implementation would not result in an increased storm drain system

capacity other than what is needed to alleviate current flooding hazards. The proposed project would not result in substantial population growth within the City, either directly or indirectly. Although the project may incrementally affect other resources that were determined to be less than significant, the project's contribution to these effects is not considered "cumulatively considerable", in consideration of the relatively nominal impacts of the project and mitigation measures provided. Refer to Section 4.0, *Environmental Analysis*, for a detailed discussion of cumulative impacts per each respective issue area analyzed.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant With Mitigation Incorporated. Previous sections of this Initial Study/Mitigated Negative Declaration reviewed the proposed project's potential impacts related to air pollution, noise, hazards and hazardous materials, and other issues. As concluded in these previous discussions, the proposed project would result in less than significant environmental impacts with implementation of the recommended mitigation measures. Therefore, the proposed project would not result in environmental impacts that would cause substantial adverse effects on human beings.

4.18 REFERENCES

The following references were utilized during preparation of this Initial Study. These documents are available for review at the City of Long Beach, 333 West Ocean Boulevard, Long Beach, California 90802 or accessed at the indicated web page.

1. California Air Resources Board, *Climate Change Proposed Scoping Plan*, October 2008, http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm.

2. California Air Pollution Control Officers Association, *CEQA and Climate Change*, January 2008, http://www.capcoa.org/ceqa/CAPCOA%20White%20Paper.pdf.

3. California Department of Conservation Division of Mines and Geology, *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report*, August 2000, http://minerals.usgs.gov/minerals/pubs/state/980601mp.pdf, accessed November 2008.

4. California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2006*, 2006, http://www.energy.ca.gov/2006publications/CEC 600 2006 013/CEC 600 2006 013 SF.PDF.

5. California Environmental Quality Act, 1970, as amended, Public Resources Code Sections 21000-21178, http://ceres.ca.gov/ceqa/.

6. California State Office of Planning and Research, *Noise Element Guidelines*, October 2003, http://www.opr.ca.gov/planning/publications/General_Plan_Guidelines_2003.pdf.

7. City of Long Beach, *Air Quality Element*, dated December 1996.

8. City of Long Beach, *Bicycle Master Plan*, dated December 2001.

9. City of Long Beach, *Conservation Element*, dated April 1973.

10. City of Long Beach, *Housing Element*, dated May 2009.

11. City of Long Beach, *Land Use Element*, dated July 1989.

12. City of Long Beach, *Local Coastal Program*, dated February 1980.

13. City of Long Beach, *Noise Element*, dated March 1975.

14. City of Long Beach, *Open Space Element*, dated October 2002.

15. City of Long Beach, *Public Safety Element*, dated May 1975.

16. City of Long Beach, *Seismic Safety Element*, dated October 1988.

17. City of Long Beach, *Transportation Element*, dated December 1991.

18. City of Long Beach, *Natural Hazards Mitigation Plan,* dated October 19, 2004.

19. City of Long Beach, *Municipal Code*, enacted April 21, 2009.

20. County of Los Angeles, *River Avenue Storm Drain Retention System Project Design Concept*, August 17, 2006.

21. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006, http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf.

22. Google Earth Maps, http://maps.google.com, accessed July 2009.

23. Kleinfelder, *Phase I Environmental Site Assessment – Proposed River Avenue Drain Phase II Project*, May 16, 2008.

24. Kleinfelder, *Report of Geotechnical Investigation – Proposed River Avenue Drain Phase II Project*, May 16, 2008.

25. Official Website of the City of Long Beach, http://www.longbeach.gov/, accessed July 2009.

26. *River Avenue Storm Drain Hydrology Report*, November 8, 2005.

27. South California Air Quality Management District, *Air Quality Management Plan for the South Coast Air Basin*, 2007, http://www.aqmd.gov/aqmp/07aqmp/07AQMP.html.

28. South Coast Air Quality Management District, *CEQA Air Quality Handbook,* November 1993, http://www.aqmd.gov/ceqa/hdbk.html.

29. South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology, Appendix C,* revised July 2008, http://www.aqmd.gov/CEQA/handbook/LST/LST.html.

30. United States Environmental Protection Agency, *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*, October 1979, revised July 1981, http://www.nonoise.org/library/handbook/handbook.htm.

4.19 REPORT PREPARATION PERSONNEL

City of Long Beach (Lead Agency)
333 West Ocean Boulevard
Long Beach, California 90802
562.570.6771

Mr. Mark Christoffels, Deputy Director of Public Works/City Engineer
Ms. Angela Reynolds, Manager, Neighborhood Services Bureau
Ms. Jill Griffiths, Advance Planning Officer
Mr. Phillip Balmeo, Assistant City Engineer

RBF Consulting (Environmental Analysis)
14725 Alton Parkway
Irvine, California 92618
949.472.3505

Mr. Glenn Lajoie, AICP, Vice President, Environmental Services
Mr. Eddie Torres, Project Director
Ms. Kristen Bogue, Project Manager/Environmental Analyst
Ms. Kelly Chiene, Environmental Analyst
Mr. Gary Gick, Word Processor
Ms. Linda Bo, Graphic Artist

Other Interested Parties

Southern California Edison Company
Corporate Real Estate
14799 Chestnut Street
Westminster, CA 92683

Ms. Christina Nuanez, Right of Way Agent

This page intentionally left blank.

5.0 INVENTORY OF MITIGATION MEASURES

Air Quality

AQ-1 During clearing, grading, earth moving, or excavation operations, excessive fugitive dust emissions must be controlled by regular water or other dust preventive measures using the following procedures, as specified in the SCAQMD Rule 403.

- Limit on-site vehicle speed to 15 miles per hour.
- Water material excavated or graded sufficiently to prevent excessive amounts of dust. Water at least twice daily with complete coverage, preferably in the late morning and after work is done for the day.
- Water or securely cover material transported on-site or off-site sufficiently to prevent generating excessive amounts of dust.
- Minimize area disturbed by clearing, grading, earth moving, or excavation operations so as to prevent generating excessive amounts of dust.
- Indicate these control techniques in project specifications. Compliance with the measure will be subject to periodic site inspections by the City.
- Prevent visible dust from the project from emanating beyond the property line, to the maximum extent feasible.
- Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for ten days or more).
- Trucks transporting soil, sand, cut or fill materials, and/or construction debris to or from the site must be tarped from the point of origin.

AQ-2 Ozone precursor emissions from construction equipment vehicles must be controlled by maintaining equipment engines in good condition and in proper tune per manufacturer's specifications, to the satisfaction of the City Engineer. Compliance with this measure must be subject to periodic inspections of construction equipment vehicles by the City and included in construction bid documents.

AQ-3 All trucks that are to haul material must comply with California Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2) and (e)(4) as amended, regarding the prevention of such material spilling onto public streets and roads. This provision must be provided in construction bid documents.

AQ-4 Construction hours, allowable work days, and phone numbers of the job superintendent must be clearly posted at all construction entrances to allow for surrounding property owners and residents to contact the job superintendent. If the job superintendent receives a complaint, appropriate corrective actions must be implemented immediately and a report taken to the reporting party.

AQ-5 Backup generators shall be used only for emergency operations. All backup generators shall be selected in consultation with the SCAQMD from their list of certified internal combustion engines.

Cultural Resources

CUL-1 If cultural materials or archeological remains are encountered during the course of grading or construction activities, the project contractor shall cease any ground disturbing activities near the find. A qualified archaeologist, approved by the City of Long Beach, shall be retained to evaluate significance of the resources and recommend appropriate treatment measures. Treatment measures may include avoidance, preservation, removal, data recovery, protection, or other measures developed in consultation with the City of Long Beach.

Geology and Soils

GEO-1 Prior to grading operations, a soils report shall be prepared for the proposed development to identify the potential for liquefaction, expansive soils, ground settlement, and slope failure. The report shall also:

- Specify loose alluvium that shall be excavated and removed from the site, as it is considered unsuitable for reuse as structural fill.
- Specify remedial measures that could be feasibly implemented to minimize potential impact.
- Analyze the potential for groundwater within the study area and recommend measures to remediate associated conditions.
- Determine the need for dewatering of areas during construction to remove all water within the excavation perimeter and recommend appropriate method of dewatering.

Hazards and Hazardous Materials

HAZ-1 Prior to construction activities, an Environmental Professional shall conduct Phase II sampling on the Southern California Edison property within the area of disturbance to confirm or deny the presence of pesticides. Should sampling deny the presence of pesticides, sampling procedures would be deemed complete. Should sampling confirm the presence of pesticides, the Environmental Professional shall recommend further site characterization and/or remedial actions, if necessary.

HAZ-2 Prior to construction activities, the exact location of petroleum pipelines along River Avenue and within the footprint of the proposed detention unit on the Southern California Edison property shall be identified. The City of Long Beach shall confirm the locations with the following petroleum pipeline owners: ConcoPhillips, Defense Energy Support Center, Kinder Morgan, Pacific Pipeline System, and Paramount.

Noise

N-1 Prior to site mobilization, a construction management plan shall be prepared which includes the following:

- All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers;
- Construction noise reduction methods such as shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment, shall be used where feasible;
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers;
- During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors;
- Operate earthmoving equipment on the construction site, as far away from vibration sensitive sites as possible; and
- Property owners and occupants located within 100 feet of the project boundary shall be sent a notice, at least 15 days prior to commencement of construction of each phase, regarding the construction schedule of the proposed project. A sign, legible at a distance of 50 feet shall also be posted at the project construction site. All notices and signs shall indicate the dates and duration of construction activities, as well as provide a contact name and a telephone number where residents can inquire about the construction process and register complaints.

This page intentionally left blank.

6.0 CONSULTANT RECOMMENDATION

Based on the information and environmental analysis contained in the Initial Study and Environmental Checklist, we recommend that the City of Long Beach prepare a Mitigated Negative Declaration for the River Avenue Storm Drain Improvements Project. We find that the proposed project could have a significant effect on a number of environmental issues, but that mitigation measures have been specified that would reduce such impacts to a less than significant level. We recommend that the second category be selected for the City of Long Beach's determination; refer to Section 3.3, *Lead Agency Determination*.

July 31, 2009
Date

Eddie Torres
Project Manager
Planning/Environmental Services
RBF Consulting

This page intentionally left blank.

APPENDICES

A. Air Quality Data
B. Geotechnical Investigation
C. Phase I Environmental Site Assessment
D. Hydrology Report
E. Noise Data

APPENDIX A:
Air Quality Data

Parenthetical URBEMIS2007 (Version 9.2.4) Assumptions
For: River Avenue Storm Drain Improvements Project
Date: July 2009

LAND USES

Land Use Type	Unit Type	Trip Rate
Construction Activities	Worker Trips	20 trips/day

CONSTRUCTION SOURCES

Year	Duration (months)	Development
2009	2	Demolition, Trenching, and Paving
2010	1	Trenching

Phase 1 - Demolition:

Year	Total Volume (cubic feet):	Daily Volume (cubic feet):	Distance to Disposal Site
2009	1,250	40	10 Miles

Demolition Equipment (URBEMIS2007 Default):

Quantity	Type	Hours of Daily Operation
2	Tractor/Loaders/Backhoe	6
1	Concrete/Industrial Saw	8
1	Rubber Tired Dozer	1

Phase 2 - Trenching:

Year	Duration (months)
2009	2
2010	1

Trenching Equipment (URBEMIS2007 Default):

Quantity	Type	Hours of Daily Operation
2	Excavators	8
1	Other General Industrial Equipment	8

Phase 3 - Paving:

Year	Duration (days)	Acres
2009	1	.12

Equipment (URBEMIS2007 Default):

Quantity	Type	Hours of Daily Operation
4	Cement and Mortar Mixers	6
1	Paver	7
1	Roller	7

1	Tractor/Loader/Backhoe	7

Sub- Phase 5 - Worker Commute

(URBEMIS2007 default all phases)

Construction Mitigation:

Refer to URBEMIS2007 file output.

7/16/2009 10:31:48 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\Programs\Air\URBEMIS\URBEMIS2007\River Avenue.urb924

Project Name: River Avenue

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (tons/year unmitigated)	0.07	0.56	0.31	0.00	0.00	0.03	0.03	0.00	0.03	0.03	54.97
2010 TOTALS (tons/year unmitigated)	0.02	0.20	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.23

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2009	0.07	0.56	0.31	0.00	0.00	0.03	0.03	0.00	0.03	0.03	54.97
Demolition 11/01/2009-12/15/2009	0.02	0.13	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	13.22
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.02	0.13	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	11.20
Demo On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Demo Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99
Trenching 11/01/2009-02/01/2010	0.05	0.42	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	40.46
Trenching Off Road Diesel	0.05	0.42	0.18	0.00	0.00	0.02	0.02	0.00	0.02	0.02	37.72
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74
Asphalt 12/30/2009-12/31/2009	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Paving Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
2010	0.02	0.20	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.23
Trenching 11/01/2009-02/01/2010	0.02	0.20	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.23
Trenching Off Road Diesel	0.02	0.19	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	18.86
Trenching Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37

Phase Assumptions

Phase: Demolition 11/1/2009 - 12/15/2009 - Default Demolition Description

Building Volume Total (cubic feet): 1250

Building Volume Daily (cubic feet): 40

On Road Truck Travel (VMT): 0.37

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Trenching 11/1/2009 - 2/1/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 12/30/2009 - 12/31/2009 - Default Paving Description

Acres to be Paved: 0.12

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

7/16/2009 10:31:11 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\Programs\Air\URBEMIS\URBEMIS2007\River Avenue.urb924

Project Name: River Avenue

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	4.57	32.37	18.75	0.00	0.03	2.06	2.08	0.01	1.89	1.90	3,127.34
2010 TOTALS (lbs/day unmitigated)	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 11/2/2009-12/15/2009 Active Days: 32	3.49	27.20	15.37	0.00	**0.03**	1.58	1.61	**0.01**	1.45	1.46	2,665.37
Demolition 11/01/2009-12/15/2009	1.27	8.23	5.92	0.00	0.02	0.64	0.67	0.01	0.59	0.60	826.30
Fugitive Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Demo Off Road Diesel	1.23	8.15	4.78	0.00	0.00	0.64	0.64	0.00	0.59	0.59	700.30
Demo On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
Demo Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Trenching 11/01/2009-02/01/2010	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 12/16/2009-12/29/2009 Active Days: 10	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching 11/01/2009-02/01/2010	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 12/30/2009-12/31/2009 Active Days: 2	**4.57**	**32.37**	**18.75**	**0.00**	0.02	**2.06**	**2.08**	0.01	**1.89**	**1.90**	**3,127.34**
Asphalt 12/30/2009-12/31/2009	2.36	13.41	9.30	0.00	0.01	1.12	1.14	0.00	1.03	1.04	1,288.27
Paving Off-Gas	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.06	0.74	0.28	0.00	0.00	0.03	0.03	0.00	0.03	0.03	91.29
Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Trenching 11/01/2009-02/01/2010	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43

Time Slice 1/1/2010-2/1/2010 Active Days: 22	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03
Trenching 11/01/2009-02/01/2010	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03
Trenching Off Road Diesel	2.06	17.69	8.22	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,714.64
Trenching Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39

Phase Assumptions

Phase: Demolition 11/1/2009 - 12/15/2009 - Default Demolition Description

Building Volume Total (cubic feet): 1250

Building Volume Daily (cubic feet): 40

On Road Truck Travel (VMT): 0.37

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Trenching 11/1/2009 - 2/1/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 12/30/2009 - 12/31/2009 - Default Paving Description

Acres to be Paved: 0.12

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

7/16/2009 10:31:33 AM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\Programs\Air\URBEMIS\URBEMIS2007\River Avenue.urb924

Project Name: River Avenue

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	4.57	32.37	18.75	0.00	0.03	2.06	2.08	0.01	1.89	1.90	3,127.34
2010 TOTALS (lbs/day unmitigated)	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

7/16/2009 10:31:33 AM

Time Slice 11/2/2009-12/15/2009 Active Days: 32	3.49	27.20	15.37	0.00	**0.03**	1.58	1.61	**0.01**	1.45	1.46	2,665.37
Demolition 11/01/2009-12/15/2009	1.27	8.23	5.92	0.00	0.02	0.64	0.67	0.01	0.59	0.60	826.30
Fugitive Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Demo Off Road Diesel	1.23	8.15	4.78	0.00	0.00	0.64	0.64	0.00	0.59	0.59	700.30
Demo On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
Demo Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Trenching 11/01/2009-02/01/2010	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 12/16/2009-12/29/2009 Active Days: 10	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching 11/01/2009-02/01/2010	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 12/30/2009-12/31/2009 Active Days: 2	**4.57**	**32.37**	**18.75**	**0.00**	0.02	**2.06**	**2.08**	0.01	**1.89**	**1.90**	**3,127.34**
Asphalt 12/30/2009-12/31/2009	2.36	13.41	9.30	0.00	0.01	1.12	1.14	0.00	1.03	1.04	1,288.27
Paving Off-Gas	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.06	0.74	0.28	0.00	0.00	0.03	0.03	0.00	0.03	0.03	91.29
Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Trenching 11/01/2009-02/01/2010	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43

Time Slice 1/1/2010-2/1/2010 Active Days: 22	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03
Trenching 11/01/2009-02/01/2010	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03
Trenching Off Road Diesel	2.06	17.69	8.22	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,714.64
Trenching Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39

Phase Assumptions

Phase: Demolition 11/1/2009 - 12/15/2009 - Default Demolition Description

Building Volume Total (cubic feet): 1250

Building Volume Daily (cubic feet): 40

On Road Truck Travel (VMT): 0.37

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Trenching 11/1/2009 - 2/1/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 12/30/2009 - 12/31/2009 - Default Paving Description

Acres to be Paved: 0.12

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Emissions

Year 2009

Demolition

Duration (days): 30

Equipment	Emission Factors (pounds/hour)			Hours/day	Quantity	Emissions (pounds/hour)			Emissions (tons/year)		
	CO_2	CH_4	N_2O			CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Tractors/Loaders/Backhoes	66.8	0.0092	0.0017	6	2	133.6	0.0184	0.0034	12.0240	0.0017	0.0003
Concrete/Industrial Saws	58.5	0.0114	0.0015	8	1	58.5	0.0114	0.0015	7.0200	0.0014	0.0002
Rubber Tired Dozers	239.1	0.0305	0.0062	1	1	239.1	0.0305	0.0062	3.5865	0.0005	0.0001
								Total Emissions for Demolition	22.6305	0.0035	0.0006

Trenching

Duration (days): 40

Equipment	Emission Factors (pounds/hour)			Hours/day	Quantity	Emissions (pounds/hour)			Emissions (tons/year)		
	CO_2	N_2O	CH_4			CO_2	N_2O	CH_4	CO_2	N_2O	CH_4
Excavators	119.6	0.0134	0.0031	8	2	239.2	0.0268	0.0062	38.2720	0.0043	0.0010
Other General Industrial Equipment	152.2	0.0166	0.004	8	1	152.2	0.0166	0.0040	24.3520	0.0027	0.0006
								Total Emissions for Trenching	62.6240	0.0069	0.0016

Paving

Duration (days): 1

Equipment	Emission Factors			Hours/day	Quantity	Emissions (pounds/hour)			Emissions (tons/year)		
	CO_2	N_2O	CH_4			CO_2	N_2O	CH_4	CO_2	N_2O	CH_4
Cement and Mortar Mixers	7.2	0.0009	0.0002	6	4	28.8	0.0036	0.0008	0.0864	0.0000	0.0000
Pavers	77.9	0.016	0.002	7	1	77.9	0.0160	0.0020	0.2727	0.0001	0.0000
Rollers	67.1	0.0106	0.0018	7	1	67.1	0.0106	0.0018	0.2349	0.0000	0.0000
Tractors/Loaders/Backhoes	66.8	0.0092	0.0017	7	1	66.8	0.0092	0.0017	0.2338	0.0000	0.0000
								Total Emissions for Paving	0.8277	0.0001	0.0000

Total Construction Emissions - Year 2009

tons/year	86.08	0.01	0.00
metric tons/year	78.09	0.01	0.00
metric tons CO_2 eq/year	78.09	2.97	0.04

Year 2010

Trenching

Duration (days): 20

Equipment	Emission Factors			Hours/day	Quantity	Emissions (pounds/hour)			Emissions (tons/year)		
	CO_2	N_2O	CH_4			CO_2	N_2O	CH_4	CO_2	N_2O	CH_4
Cement and Mortar Mixers	7.2	0.0009	0.0002	6	4	28.8	0.0036	0.0008	1.7280	0.0002	0.0000
Pavers	77.9	0.016	0.002	7	1	77.9	0.0160	0.0020	5.4530	0.0011	0.0001
Rollers	67.1	0.0106	0.0018	7	1	67.1	0.0106	0.0018	4.6970	0.0007	0.0001
Tractors/Loaders/Backhoes	66.8	0.0092	0.0017	7	1	66.8	0.0092	0.0017	4.6760	0.0006	0.0001
								Total Emissions for Building Construction	16.5540	0.0027	0.0004

Total Construction Emissions - Year 2010

tons/year	16.55	0.00	0.00
metric tons/year	15.02	0.00	0.00
metric tons CO_2 eq/year	15.02	0.77	0.01

Notes:
Construction Equipment Emission Factor Source: Provided by SCAQMD.
Refer to the URBEMIS 2007 assumptions and model output for construction equipment assumptions

APPENDIX B:
Geotechnical Investigation

REPORT OF
GEOTECHNICAL INVESTIGATION
PROPOSED
RIVER AVENUE DRAIN PHASE II PROJECT
RIVER AVENUE AND MCHELEN AVENUE
LONG BEACH, CALIFORNIA

MAY 16, 2008

KLEINFELDER
Bright People. Right Solutions.

620 West 16th Street, Unit F
Long Beach, CA
90813

p| 562.432.1696
f | 562.432.1796

kleinfelder.com

May 16, 2008
File No: 93788

Mr. Frank Sanchez P.E.
Civil Engineer
City of Long Beach
Department of Public Works
Bureau of Engineering/Project Management Division
333 West Ocean Boulevard, 9th Floor
Long Beach, California 90802

Subject: **Report of Geotechnical Investigation**
Proposed River Avenue Drain Phase II Project
River Avenue and McHelen Avenue
Long Beach, California

Dear Mr. Sanchez

Kleinfelder is pleased to present this report summarizing our geotechnical investigation conducted for the subject project.

The project alignment is located along River Avenue and McHelen Avenue, just north of the existing Edison property (south of Arlington Street) and terminating in the vicinity of the intersection of McHelen Avenue with 221st Street. The purpose of our investigation was to explore and evaluate the subsurface conditions along the project alignment and provide geotechnical recommendations for design and construction of the subject project.

The findings of our investigation and our conclusions and recommendations pertaining to this project are presented in the attached report.

We appreciate the opportunity to be of service on this project. If you have any questions or require additional information, please do not hesitate to contact the undersigned.

Respectfully submitted,

KLEINFELDER

Mariusz P. Sieradzki, Ph.D., P.E.
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
MARIUSZ P. SIERADZKI
No. C 56925
Exp. 06/30/09
CIVIL
STATE OF CALIFORNIA

Paul D. Guptill, P.G., C.E.G.
Senior Principal Engineering Geologist

PROFESSIONAL GEOLOGIST
PAUL D. GUPTILL
NO. 1081
CERTIFIED
ENGINEERING
GEOLOGIST
Exp. 11/30/08
STATE OF CALIFORNIA

KLEINFELDER
Bright People. Right Solutions.

TABLE OF CONTENTS

APPENDICES

PLATES

EXECUTIVE SUMMARY

This report presents the results of our geotechnical investigation for the proposed River Avenue Drain Phase II project located along River Avenue and McHelen Avenue, in Long Beach, California. The purposes of this investigation were to evaluate the general subsurface soil conditions, the nature and engineering properties of the subsurface soils, to assess developing the site for the intended purpose, and to provide recommendations for the design and construction of the proposed project. Phase I, Environmental Site Assessment along the project alignment is presented in a separate report prepared by Kleinfelder. This executive summary briefly summarizes results of our geotechnical investigation for the subject project and should be used only in conjunction with the findings and conclusions presented in the following report.

The site subsurface conditions were investigated by conducting a field exploration program and by performing laboratory testing on select samples from those boreholes. Six exploratory borings were advanced along the project alignment. The borings were advanced to depths ranging between 16 to 51 feet below the existing ground surface (bgs). Selected soil samples were tested in our laboratory to evaluate pertinent engineering properties.

The principal soil deposits encountered during our investigation generally consisted of loose to medium dense silty sand and sandy silt underlain by medium stiff to stiff sandy clay. In the deeper boring, layer of dense sand with silt was encountered below the depth of approximately 25 feet. Groundwater was encountered in one boring at depth of 25 feet at the time of drilling. The depth to historic high groundwater at the project alignment is reported to be approximately 20 feet below the existing grades (CDMG, 2001)

A review of selected geologic data indicates that no known active or potentially active faults cross the site. The closest mapped fault is the Newport Inglewood fault, located approximately 6,000 feet northeast of the project alignment. The project site is located within a State of California Hazard Zone for Liquefaction (CDMG, 1999).
Based on the results of our field and laboratory investigation, if our engineering considerations are addressed by the design, it is our opinion that design and construction of the projects is feasible from a geotechnical standpoint.

1. INTRODUCTION

1.1 GENERAL

Kleinfelder was retained by the City of Long Beach (City) to conduct a geotechnical investigation for the River Avenue Drain Phase II Project. The project alignment is located along River Avenue and McHelen Avenue, just north of the existing Edison Property (south of Arlington Street) and terminating in the vicinity of the intersection of McHelen Avenue and 221st Street. The location of the site is presented in Plate 1, Site Location Map. The scope of our services was presented in a proposal entitled, "Revised Proposal for Geotechnical Investigation and Environmental Site Assessment, Proposed River Avenue Drain Phase II Project, Long Beach California", dated February 13, 2008.

This report presents our geotechnical recommendations for the design and construction of the project. Phase I, Environmental Site Assessment is presented in a separate report prepared by Kleinfelder. Geotechnical conclusions and recommendations presented in this report are based on the subsurface conditions encountered at the locations of our explorations and the provisions and requirements outlined in the Additional Services and Limitations Sections of this report. Recommendations presented herein should not be extrapolated to other areas or be used for other projects without our prior review.

1.2 PURPOSE AND SCOPE

The purpose of this investigation was to explore and evaluate subsurface conditions at the site and to provide geotechnical recommendations for design and construction of the proposed project. A description of the scope of services performed is presented below.

- Review available existing geologic and geotechnical data.
- Collect geotechnical data (field and laboratory) to characterize the subsurface soil and groundwater conditions.
- Evaluate geologic hazards.
- Provide recommendation for temporary excavation, pipe bedding and trench backfill.
- Prepare a report with field test data, laboratory test results along with findings, conclusions and geotechnical recommendations for this project.

1.3 PROPOSED DEVELOPMENT AT THE SITE

Based on information provided by the City it is our understanding that the proposed project will consist of construction of a new storm drain along River Avenue and McHelen Avenue starting south from the existing Edison property (immediately south of Arlington Street) and terminating in the vicinity of the intersection of River Avenue with 221st Street. The total length of the proposed storm drain alignment will be approximately 1,800 feet. The pipeline will be reinforced concrete pipe (RCP) ranging in diameter from 48 to 54 inches. The invert depth will along the alignment from approximately 9 feet to 13 feet below the existing grades. In addition, a detention basin will be constructed within the Edison Property as a part of this project. Other details pertaining to this project were not available at the time of this report.

1.4 FIELD EXPLORATION

Six borings using a hollow-stem-auger drill rig provided by Cal Pac Drilling were advanced along the project alignment to depths ranging from approximately 26 to 51 feet below the existing grades. To reduce the likelihood of encountering buried utility lines at the site of drilling, geophysical survey was conducted to identify and delineate potential buried utility lines and other detectable subsurface obstructions in the vicinity of the boring locations. Modified California (MC) and Standard Penetration Test (SPT) samplers were used to obtain samples of the soil encountered. The MC and SPT samplers were driven using a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final 12 inches is termed the blow count (N-value) and is recorded on the boring logs. The blow counts recorded on the Logs of Borings are the recorded field blow counts, and have not been corrected for sampler types, rod length, overburden pressure, sampler's liner or hammer energy. The samples were classified in accordance to Unified Soil Classification System (USCS) procedure. All soil samples were screened for the presence of volatile organic components (VOC) in the field using a photo-ionization detector (PID). VOC readings of soil samples were recorded on boring logs. Selected samples were retrieved, sealed and transported to our laboratory for further evaluation. All borings were logged by a Registered Civil Engineer. Upon completion, all holes were backfilled with soil from cuttings. The top of each boring advanced across the any paved areas were covered with a cold asphalt patch.

A description of the field exploration, an explanation of the logs, and the logs of borings are presented in appendix A. The locations of the borings are shown on Plate 2, Boring Location Map.

1.5 LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and geotechnical engineering properties. Kleinfelder completed a portion of the laboratory in-house at our Long Beach and Diamond Bar laboratories. The remainder of the laboratory tests was subcontracted to AP Engineering and Testing, Inc. Laboratory in Pomona, California. Tests performed are evaluation of dry density and moisture content, grain size distribution, plasticity index, direct shear, corrosion potential and sand equivalent. Results of laboratory tests are presented in Appendix B.

2. SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

The site includes an approximately 1,800-foot length of River Avenue and McHelen Avenue, which are continuous asphalt-paved roadways, with mostly residential houses along the roadways. In addition, the southern portion of the Site consists of an approximately 100-foot by 250-foot area located within a parcel (Edison Property) presently used as a plant nursery by Orange County Nursery, Inc.

A number of above-ground power lines traverse the site. The site is relatively flat with elevations ranging from approximately 20 feet MSL at the southern end to approximately 22 feet MSL at the northern end.

2.2 SUBSURFACE SOILS

2.2.1 General

Soil deposits encountered during our investigation generally consist of alternating layers of loose to medium dense silty sand/sandy silt underlain by medium stiff to stiff sandy clay and by dense sand with silt.

Laboratory test results of samples obtained from the test borings indicate in situ dry densities varying from 92 to 108 pounds per cubic foot (pcf) with water content varying from 9.5 to 18.1 percent. Detailed descriptions of the subsurface conditions encountered during our field investigation are presented on the Logs of Borings in Appendix A. Laboratory test results are presented in Appendix B.

2.2.2 Corrosion Characteristics

Two samples of the soil were tested for potential corrosion to concrete and reinforcing steel. Samples were sent to AP Engineering and Testing, Inc., Pomona, California. The samples were tested in general accordance with California Test Methods 643, 422, and 417 for pH, resistivity, soluble chlorides, and soluble sulfates, respectively. The test results are presented in

Appendix B. This test is only an indicator of soil corrosivity for the sample tested. Other soils found on site may be more, less, or of a similar corrosive nature. Although Kleinfelder does not practice corrosion engineering, the corrosion values from the soil tested are normally considered low corrosive to concrete and moderate corrosive to ferrous metals.

2.4 GROUNDWATER

Groundwater was encountered at the time of drilling in one boring (B-1) at depth of approximately 25. According to the California Division of Mines and Geology (CDMG 2001) the historical high groundwater level is reported to be approximately 20 feet below the ground surface.

Fluctuations of the groundwater level, localized zones of perched water and increased soil moisture content should be anticipated during and following the rainy season. Irrigation of landscaped areas on or adjacent to the site or daily tidal changes can also cause a fluctuation of local groundwater levels.

3. GEOLOGIC CONDITIONS

3.1 REGIONAL SETTING

The alignment is located on the Central Plain of the southwestern Block of the Los Angeles Basin. The Los Angeles Basin, which lies within the Peninsular Ranges geomorphic province. Regionally, the area has been mapped as underlain by Holocene age surficial sediments, described as alluvial flood plain deposits of Dominguez Creek and the Los Angeles River (CDMG, 1962).

3.2 GEOLOGIC HAZARDS

Faulting

The site is not located within any State of California-Special Studies Zone, formerly Alquist-Priolo Earthquake Fault Zone (Hart and Bryant, 1997). The closest mapped fault to the site is the Newport-Inglewood fault, which is mapped approximately 6000 feet northeast of the alignment (CDMG, 1986).

Landslides

The site is not within a State or County designated hazard zone for landslides (CDMG, 1999; Los Angeles Co., 1990). Because the site is relatively flat, the risk of landslides at the site is considered very low.

Land Subsidence and Earth Fissures

Land subsidence occurs as a result of sediment consolidation subsequent to fluid (oil or water) withdrawal. The site is located north of documented occurrences of land subsidence and earth fissures resulting from oil withdrawal (Allen, 1973; Rutledge, et al, 2002). The risk of land subsidence and earth fissures due to oil withdrawal along the alignment is considered low.

Liquefaction

Liquefaction occurs when loose, coarse-grained or silty soils are subjected to strong shaking resulting from earthquake motions. The coarse-grained or silty soils typically lose a portion or all of their shear strength, and regain strength sometime after the shaking stops. Soil movements (both vertical and lateral) have been observed under these conditions due to consolidation of the liquefied soils. The project site is located within a State of California Hazard Zone for Liquefaction (CDMG, 1999). Due to the soil types and relative density encountered in the borings, the liquefaction potential along the project alignment is considered to be moderate.

Oil Wells, Oil Fields, and Methane Gas

There are no known oil wells along the alignment (Munger, 2001; DOGGR, 2008). Because of the location of this site relative to oil fields and oil wells, there is some potential for the presence of naturally occurring hydrocarbons and oil field gases within subsurface soils at the site.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL

Based on our field exploration, laboratory testing and geotechnical analyses conducted for this study, it is our opinion that it is geotechnically feasible to construct the project as planned provided that the recommendations presented in this report are incorporated into project design and construction.

Based on the findings summarized in this report, it is our professional opinion that the proposed construction will not be subject to a hazard from settlement, slippage, or landslide, provided the recommendations of this report are incorporated into the proposed construction. It is also our opinion that the proposed construction will not adversely affect the geologic stability of the site or adjacent properties provided the recommendations contained in this report are incorporated into the proposed construction.

Kleinfelder's recommendations regarding the geotechnical aspects of project design and construction are presented in the following sections.

4.2 LIQUEFACTION POTENTIAL

The site is located within a seismic hazard zone for liquefaction potential, as designated by the State and County of Los Angeles. Results of our preliminary study indicated that there is a potential for liquefaction when subjected to ground shaking. We estimate that total and differential settlements due to liquefaction along the storm drain alignment may be on the order of 1.5 inches and 0.75 inch, respectively.

4.3 DESIGN STRENGTH PARAMETERS

Based on the soil types encountered in our exploratory borings and laboratory test results, we recommend using the following geotechnical strength parameters for the design of the proposed project:

Soil unit weight - γ: 120 pcf
Friction angle – Φ: 30 deg
Cohesion – c: 0 psf

4.4 GUIDELINES FOR TEMPORARY EXCAVATIONS

4.4.1 Temporary Excavations

All excavations must comply with applicable local, state, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Construction site safety is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing the information below solely as a service to our client. Under no circumstances should the information provided be interpreted to mean that Kleinfelder is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred.

Exploratory borings advanced at the site were completed with little to moderate effort through the existing on-site soils. Conventional earth moving equipment is expected to be capable of performing the excavations required for site development.

Construction guidelines for trench excavations should be in general accordance with the City of Long Beach Trench Width and Bedding Requirements Standard Plan No. 634. The following guidelines are also recommended for temporary trench excavations along the proposed storm drain.

4.4.2 Temporary Slopes

Stability of temporary excavations is a function of several factors. Some of these factors are: the duration of time the excavation is exposed, surface drainage and groundwater conditions, soil type and consistency, and contractor's operations. Near-surface soils encountered in our borings at the time of our investigation generally consisted of silty sand. In our opinion, this soil can be classified as a Type C soil with regard to the OSHA regulations. For this soil type, OSHA requires a maximum slope inclination of 1.5:1.0 (horizontal to vertical) or flatter. Subgrade soils excavated below groundwater level are likely prone to caving and/or sloughing, and could endanger personnel working within or adjacent to the excavation as well as nearby equipment, structures, or other existing improvements. Therefore, Kleinfelder recommends that any excavation extended below groundwater be shored immediately without any standup time, to reduce the potential for instability of excavated slopes and any existing nearby structures and/or improvements.

4.4.3 Shoring

Shoring will be required where space or other restrictions do not allow a sloped excavation. A braced or cantilevered shoring system may be used.

Braced excavations should be designed to resist a uniform horizontal soil pressure of 32H (in pounds per square foot, psf) where 'H' is the excavation depth in feet. A temporary cantilevered shoring system should be designed to resist an active earth pressure equivalent to a fluid weighing 40 pounds per cubic foot (pcf). The values provided above assume a level ground adjacent to the top of the shoring.

Fifty percent of a surcharge load placed adjacent to the shoring may be assumed to act as a uniform horizontal pressure against the shoring. Special cases such as combination of slopes and shoring or other surcharge loads (not specified above) may require an increase in the design values recommended above. These conditions should be evaluated by the project geotechnical engineer on a case-by-case basis.

Cantilevered shoring must extend to a sufficient depth below the excavation bottom to provide the required lateral resistance. Kleinfelder recommends required embedment depths be estimated using method for evaluating sheet pile walls and based on the principles of force and

moment equilibrium. For this method, the allowable passive pressure against shoring, which extends below the bottom of excavation, may be assumed to be equivalent to a fluid weighing 275 pcf.

Additionally, we recommend a factor of safety of 1.2 be applied to the calculated embedment depth and that passive pressure is limited to 2,000 psf.

The contractor should be responsible for the structural design and safety of all temporary shoring systems.

4.5 PIPE BEDDING AND TRENCH BACKFILL

4.5.1 Pipe Bedding

Coarse-grained soils (sands) are expected to be exposed at the storm drain invert elevation along most of the alignment. These materials should be easily worked and are suitable for bedding of the pipe. Layers of fine- grained material which may be encountered along the alignment are considered to be unsuitable for pipe bedding. Bedding materials should consist of sand, gravel, crushed aggregate on-site free-draining granular material with a maximum particle size of 3/4 inch and sand equivalent of at least 30. Bedding materials should also conform to the pipe manufacturer's specifications, if available.

Import of bedding materials may be necessary where porous, or other unsuitable materials are present at the invert elevation. In these areas, the trench should be excavated to a depth of at least 6 inches below the bottom of the pipe. The overexcavation should be replaced with suitable bedding materials and compacted to at least 85 percent relative compaction.

4.5.2 Pipe Zone Backfill

The pipe zone included the full width of the trench from the bottom to a horizontal level 12 inches above the top of the pipe. Soils generated from the trench excavations along the alignment should generally be suitable for use as pipe zone backfill provided the backfill has a maximum particle size of ¾ inch and is free of vegetation, debris, organics and other deleterious material. Sufficient material suitable for use as pipe zone backfill should exist along the alignment; however, stockpiling and transportation of selected pipe zone backfill during trench excavation may be necessary.

4.5.3 Above Pipe Zone Backfill

The above pipe zone is the full width of the trench above the pipe zone to the street pavement section. Soils generated from trench excavations along the alignment are considered suitable for use as backfilling the above pipe zone, provided the backfill is less than 3 inches in maximum dimensions, and is free of vegetation, debris, organics and other deleterious materials.

4.5.4 Import Materials

If import material is used for pipe or above pipe zone backfill, we recommend it consist of fine-grained sand with a sand equivalent of at least 30. Import materials should be documented to be free of hazardous materials including petroleum or petroleum byproducts, chemicals, and harmful minerals. All import materials should be evaluated by the project geotechnical engineer prior to use.

4.5.5 Compaction Method

After moisture-conditioning, the on-site materials along the alignment will be suitable for placement and compaction using conventional mechanical methods. Jetting of pipe bedding or trench backfill materials should not be permitted.

Regardless of the method of compaction used, materials should be brought up at substantially the same rate on both sides of the pipe. Care should be taken so that the pipe is not floated or displaced before backfilling is completed.

Pipe zone and above pipe zone backfill should be moisture conditioned to near optimum moisture content and placed in horizontal lifts less than 12 inches in loose thickness and compacted to at lest 90 percent of the maximum dry density based on ASTM Test Method D1557. Reduction of the lift thickness may be necessary to achieve the above recommended compaction. The upper 18 inches of backfill below street pavement section should be compacted to at least 95 percent relative compaction.

5. ADDITIONAL SERVICES

We recommend that all earthwork and materials for construction to be monitored by a representative from Kleinfelder, including site preparation, excavation, placement of all engineered fill and trench backfill. The purpose of these services would be to provide the opportunity to observe the soil conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

6. LIMITATIONS

Recommendations contained in this report are based on our field observations and subsurface explorations, limited laboratory tests, and our present knowledge of the proposed future construction. It is possible that soil conditions could vary between or beyond the points explored.

We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our investigation. No warranty is expressed or implied. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by Kleinfelder during the construction phase in order to evaluate compliance with our recommendations.

Any party other than the client who wishes to use this document shall notify Kleinfelder of such intended use. Non-compliance with these requirements will release Kleinfelder from any liability resulting from the use of this document by an authorized party.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than 2 years from the date of the report. Land or facility use, on and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold harmless Kleinfelder from any claim or liability associated with such unauthorized use or non-compliance.

7. REFERENCES

Allen, D.R., 1973, Oil Field Subsidence: Susceptibility and Monitoring Techniques: Presented to American Association of Petroleum Geologists, Anaheim, California, May 1973.

California Division of Mines and Geology (CDMG), 1986, State of California Special Studies Zones Map, Long Beach Quadrangle, Revised Official Map, released July 1, 1986.

California Division of Mines and Geology, 1999, State of California Seismic Hazard Zones Map, Long Beach Quadrangle, Official Map, released March 25, 1999.

California Division of Mines and Geology, 2000, Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones of California, Southern Region, DMG CD 2000-003.

California Division of Mines and Geology, 2001, Seismic Hazard Evaluation of the Long Beach 7.5 Minute Quadrangle, Los Angeles County, Seismic Hazard Zones Report 028, last revised January 13, 2006.

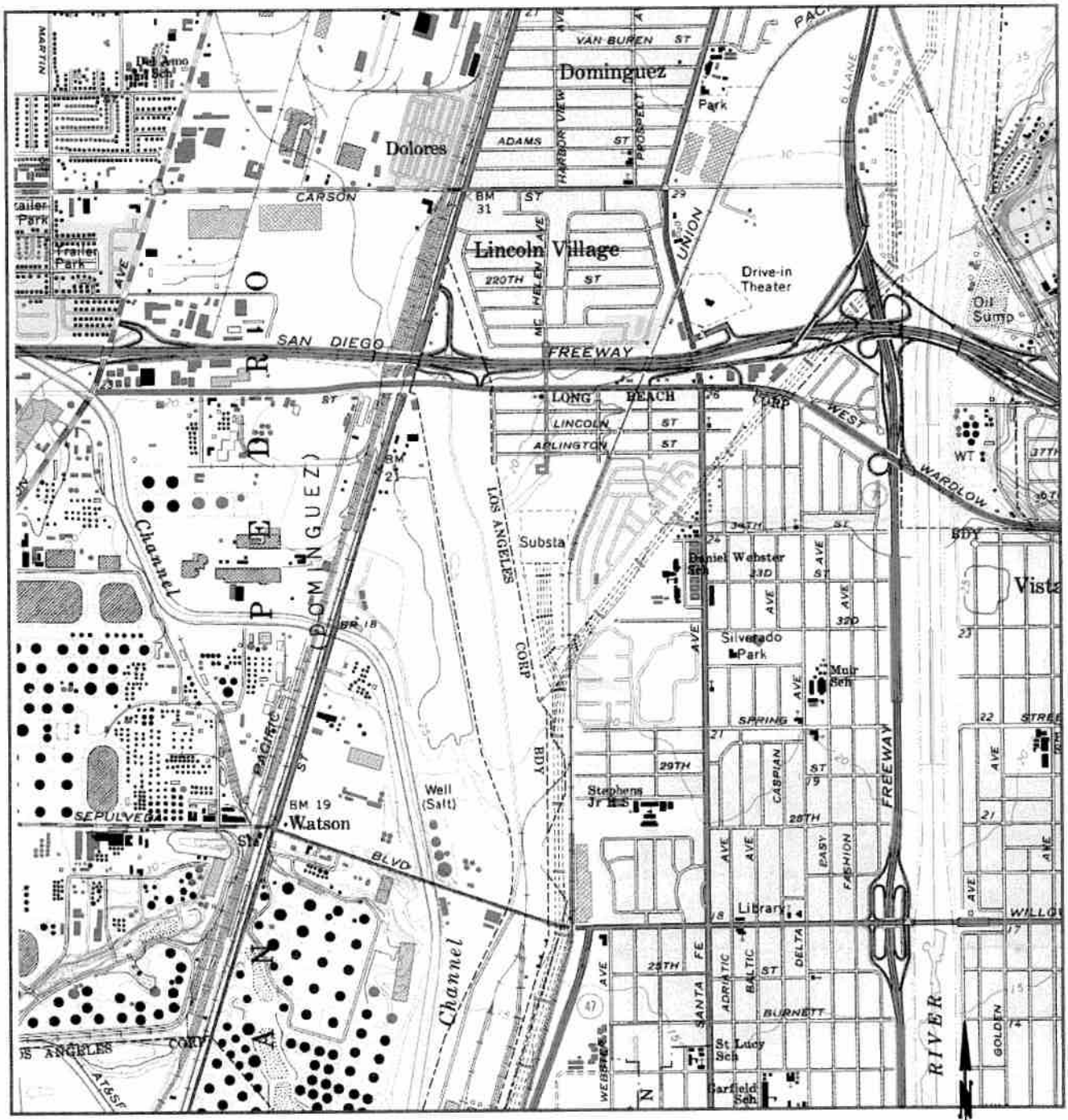
California Division of Oil, Gas, and Geothermal Resources (DOGGR), 2008, Oil and Gas Map, District 1, Map W1-6, accessed on the World Wide Web, http://www.conservation.ca.gov/dog/ /maps/Pages/index_map.aspx

California Geologic Survey (CGS), 2003, The Revised 2002 California Probabilistic Seismic Hazard Maps, released June 2003.

FEMA, 2008, Map Service Center, Map Panel 0601360010C, dated July 6, 1998 accessed on the World Wide Web, http://store.msc.fema.gov.

Rutledge, D., Remondi, B., Koerner, R., and Henderson, C., 2002, GPS Monitors Oilfield Subsidence, GPS World, article located at www.gpsworld.com/gpsworld/content/printContentPopup.jsp?id=34931.

PLATES



EXPLANATION

SITE LIMITS

SOURCE: U.S.G.S. 7.5' topographic series, Long Beach, California quadrangle dated 1964, photo revised 1981.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	93788
DRAWN:	05/14/08
DRAWN BY:	MG
CHECKED BY:	PD
FILE NAME:	93788p1_Geo.dwg

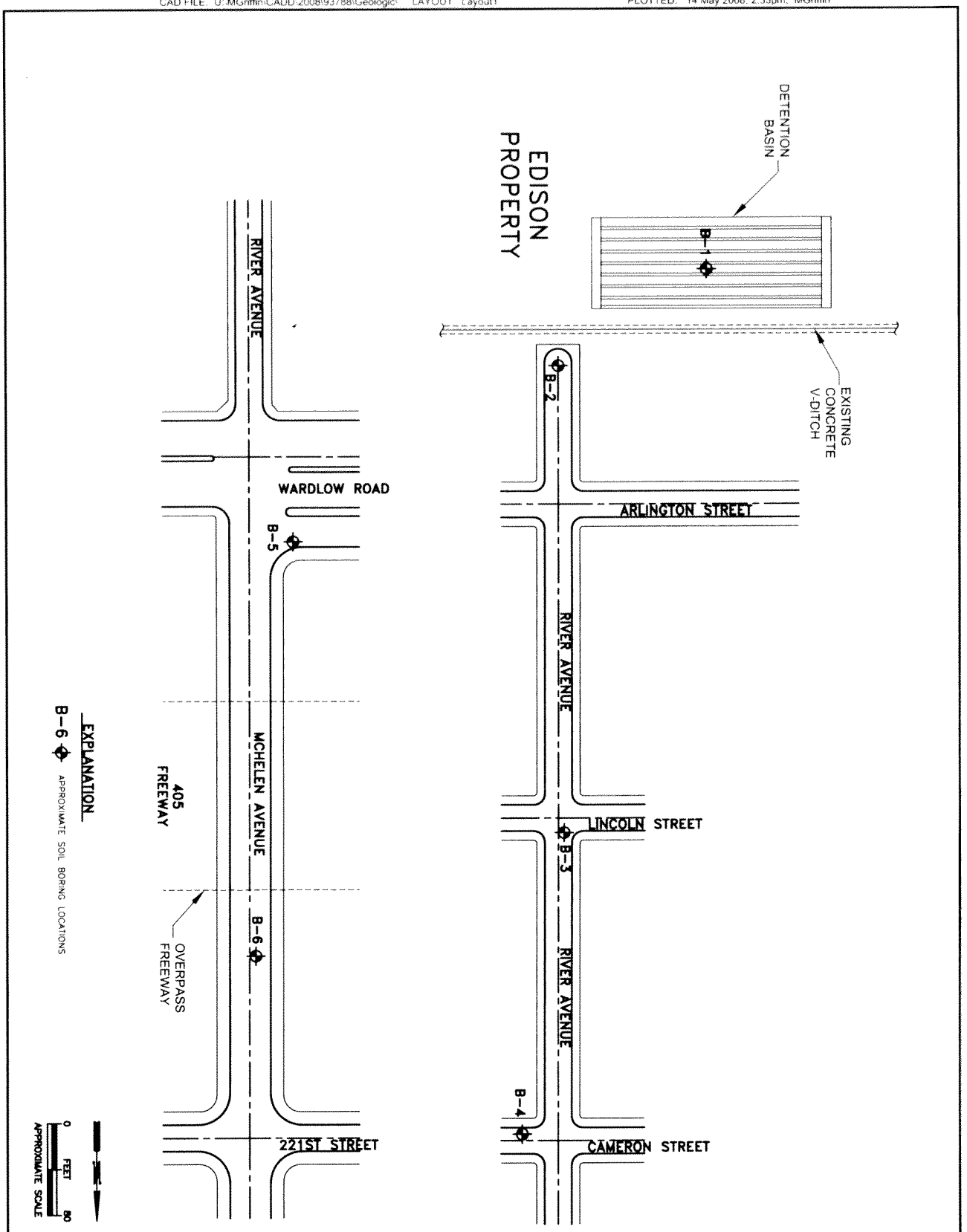
SITE LOCATION MAP

PROPOSED RIVER AVENUE
DRAIN PHASE II PROJECT
LONG BEACH, CALIFORNIA

PLATE
1

ATTACHED IMAGES: Images: image1.JPG
ATTACHED XREFS:
CAD FILE: U:\MGriffin\CADD\2008\93788\Geologic\ LAYOUT: Layout1
PLOTTED: 19 May 2008, 2:10pm, dfahmey

ATTACHED IMAGES: Images: IMAGE1.JPG Images: IMAGE2.JPG Images: IMAGE3.JPG images: IMAGE4.JPG
ATTACHED XREFS:
CAD FILE: U:\MGriffin\CADD\2008\93788\Geologic\ LAYOUT: Layout1 PLOTTED: 14 May 2008, 2:33pm, MGriffin



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.	93788
DRAWN:	05/14/08
DRAWN BY:	M. GRIFFIN
CHECKED BY:	M.S.
FILE NAME:	93788p2_Geo.dwg

BORING LOCATION MAP

PROPOSED RIVER AVENUE
DRAIN PHASE II PROJECT
LONG BEACH, CALIFORNIA

PLATE
2

APPENDIX A

FIELD EXPLORATION

APPENDIX A
FIELD EXPLORATION

The subsurface exploration program consisted of the excavation and logging 6 hollow-stem auger borings. The borings ranged in depth from approximately 16 to 51 feet below existing grades. Plate 2 shows approximate locations of the exploratory points.

The Logs of Borings are presented as Plates A-2 through A-7. A legend to the logs is presented as Plate A-1. The Logs of Borings describe the earth materials encountered, samples obtained and show field and laboratory tests performed. The logs also show the location, boring number, drilling date and the name of the logger and drilling subcontractor. The borings were logged by an engineer using the Unified Soil Classification System. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Bulk and drive samples of representative earth materials were obtained from the borings at maximum intervals of about 5 feet.

The exploratory borings were advanced using a truck-mounted drill rig equipped with 8-inch augers provided by Cal Pac Drilling of Calimesa, California. All borings were backfilled using soil from cuttings. Top of each borehole in paved areas was covered with a cold asphalt patch.

A California sampler was used to obtain drive samples of the soil encountered. This sampler consisted of a 3-inch O.D., 2.4-inch I.D. split barrel shaft that is driven a total of 12-inches into the soil at the bottom of the boring. The soil was retained in two 6-inch sets of 1-inch brass rings for laboratory testing. An additional 2-inch of soil from each drive remained in the cutting shoe and was discarded after visually classifying the soil. The sampler was driven using a 140-pound hammer falling 30-inches. The total number of hammer blows required to drive the sampler the 12-inches is termed the blow count and is recorded on the Logs of Borings. Bulk samples of the surface soils were retrieved directly from the auger blades.

Date Drilled:
Drilled By:
Drilling Method:
Logged By:

Water Depth:
Date Measured:
Reference Elevation:
Datum:

Elevation (feet) Depth	Sample	Sample No.	Blow Count (Blows/ft.)	Graphic Log	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
		1	6			108	10	DS, SE
		2	12					GS
5								
	(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)
10								

NOTES ON FIELD INVESTIGATION

1. SAMPLE – Graphical representation of sample type as shown below.
   - Split Spoon – Standard Penetration Test Sample (SPT)
   - Drive Sample – California Sample (Cal)
   - Bulk Sample – Obtained by collecting cuttings in a plastic bag
   - Tube Sample – Shelby/Pitcher Tube Sample

2. SAMPLE NO. – Sample Number

3. BLOWS/FT – Number of blows required to advance sampler 1 foot (unless a lesser distance is specified). Samplers in general were driven into the soil at the bottom of the hole with a standard (140 lb) hammer dropping a standard 30 inches. Drive samples collected in bucket auger borings may be obtained by dropping non-standard weight from variable heights. When a SPT sampler is used the blow count conforms to ASTM D-1586.

   SCR/RQD – Sample Core Recovery (SCR) in percent (%) and Rock Quality Designation (RQD) in percent (%). RQD is defined as the percentage of core in each run which the spacing between natural fractures is greater than 4 inches. Mechanical breaks of the core are not considered.

4. GRAPHIC LOG – Standard symbols for soil and rock types, as shown on plate A-1b.

5. GEOTECHNICAL DESCRIPTION

   Soil – Soil classifications are based on the Unified Soil Classification System per ASTM D-2487, and designations include consistency, moisture, color and other modifiers. Field descriptions have been modified to reflect results of laboratory analyses where deemed appropriate.

   Rock – Rock classifications generally include a rock type, color, moisture, mineral constituents, degree of weathering, alteration, and the mechanical properties of the rock. Fabric, lineations, bedding spacing, foliations, and degree of cementation are also presented where appropriate.

   Description of soil origin or rock formation is placed in brackets at the beginning of the description where applicable, for example, Residual Soil.

6. DRY DENSITY, MOISTURE CONTENT: As estimated by laboratory or field testing.

7. ADDITIONAL TESTS – (Indicates sample tested for properties other than the above):
   - MAX – Maximum Dry Density
   - GS – Grain Size Distribution
   - SE – Sand Equivalent
   - EI – Expansion Index
   - CHEM – Sulfate and Chloride Content, pH, Resistivity
   - PM – Permeability
   - UU – Unconsolidated Undrained Triaxial
   - SG – Specific Gravity
   - HA – Hydrometer Analysis
   - AL – Atterberg Limits
   - RV – R-Value
   - CN – Consolidation
   - CU – Consolidation Undrained Triaxial
   - CD – Consolidated Drained Triaxial
   - PP – Pocket Penetrometer
   - WA – Wash Analysis
   - DS – Direct Shear
   - CP – Collapse Potential
   - UC – Unconfined Compression
   - T – Torvane

8. ATTITUDES – Orientation of rock discontinuity observed in bucket auger boring or rock core, expressed in strike/dip and dip angle, respectively, preceeded by a one-letter symbol denoting nature of discontinuity as shown below.

   B: Bedding Plane J: Jointing C: Contact F: Fault S: Shear

KLEINFELDER
Bright People. Right Solutions.

EXPLANATION OF LOGS

PLATE
A-1a

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

PRIMARY DIVISIONS			GROUP SYMBOLS	SECONDARY DIVISIONS
COURSE GRAINED SOILS MORE THAN HALF OF MATERIALS IS LARGER THAN #200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COURSE FRACTION IS LARGER THAN #4 SIEVE	CLEAN GRAVELS (LESS THAN) 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVEL WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF OF COURSE FRACTION IS SMALLER THAN #4 SIEVE	CLEAN SANDS (LESS THAN) 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF OF MATERIALS IS SMALLER THAN #200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
	HIGHLY ORGANIC SOILS		PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS
TYPICAL FORMATIONAL MATERIALS	SANDSTONES		SS	
	SILTSTONES		SH	
	CLAYSTONES		CS	
	LIMESTONES		LS	
	SHALE		SL	

CONSISTENCY CRITERIA BASED ON FIELD TESTS

RELATIVE DENSITY – COARSE – GRAIN SOIL

RELATIVE DENSITY	SPT * (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	0 – 15
Loose	4 – 10	15 – 35
Medium Dense	10 – 30	35 – 65
Dense	30 – 50	65 – 85
Very Dense	>50	85 – 100

CONSISTENCY– FINE–GRAIN SOIL

CONSISTENCY	SPT (# blows/ft)	TORVANE UNDRAINED SHEAR STRENGTH (tsf)	POCKET ** PENETROMETER UNCONFINED COMPRESSIVE STRENGTH (tsf)
Very Soft	<2	<0.13	<0.25
Soft	2 – 4	0.13 – 0.25	0.25 – 0.5
Medium Stiff	4 – 8	0.25 – 0.5	0.5 – 1.0
Stiff	8 – 15	0.5 – 1.0	1.0 – 2.0
Very Stiff	15 – 30	1.0 – 2.0	2.0 – 4.0
Hard	>30	>2.0	>4.0

* NUMBER OF BLOWS OF 140 POUND HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1 3/8 INCH I.D.) SPLIT BARREL SAMPLER (ASTM–1586 STANDARD PENETRATION TEST)

** UNCONFINED COMPRESSIVE STRENGTH IN TONS/SQ.FT. READ FROM POCKET PENETROMETER

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

KLEINFELDER
Bright People. Right Solutions.

EXPLANATION OF LOGS

PLATE
A-1b

Date Drilled:	4/24/08	Water Depth:	25 feet
Drilled By:	CalPac	Date Measured:	4/24/08
Drilling Method:	HSA	Elevation:	20 feet (approx.)
Logged By:	YZ	Datum:	MSL

Elevation (feet)	Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
						SILTY SAND (SM), gray, moist, fine- grained.			
15	5		1	13		**SANDY SILT (ML)**, gray brown, moist, loose, fine- grained, trace of clay.	97	12.2	PID=27 ppm PI
10	10		2	12		**SILTY SAND (SM)**, gray, moist, loose, fine- grained.	95	11.7	PID=35 ppm SHEAR
5	15		3	15			98	13.6	PID=18 ppm
0	20		4	19		medium dense.			PID=11 ppm WASH, SE
-5	25	▼	5	36		**SAND WITH SILT (SP-SM)**, gray brown, moist, dense, fine- to medium- grained. wet below 25 feet.			PID=30 ppm
-10	30		6	37		fine- to coarse- grained.			PID=10 ppm
-15	35		7	39					PID=16 ppm
-20	40		8	44					PID=18ppm WASH
-25	45		9	43		fine- grained.			PID=19ppm
-30	50		10	46					PID=8 ppm
						Boring terminated at 51.5 feet. Groundwater was encountered at depth of 25 feet. Hole backfilled with soil from cuttings.			

GEOTECH DB STORM DRAIN GPJ KA RDLND GDT 5/15/08

KLEINFELDER
Bright People. Right Solutions.

River Avenue Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

PLATE
A-2

PROJECT NO. 93788

LOG OF BORING B-1

Drafted By: Reviewed By:

Legend To Logs On Plate A-1

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled:	4/24/08	Water Depth:	>26.5
Drilled By:	CalPac	Date Measured:	4/24/08
Drilling Method:	HSA	Elevation:	19 feet (approx.)
Logged By:	YZ	Datum:	MSL

Elevation (feet) / Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
					Asphalt Concrete, 3-inch thick **Aggregate Base**, 3-inch thick			
15		1			**SILTY SAND (SM)**, gray, moist, fine- grained			PID=1 ppm MAX
5		2	8		loose, interbedded with sandy clay	92	10.6	PID=57 ppm CHEM
10		3	21		medium dense			PID=25 ppm SE
5		4	26			108	14.5	PID=31 ppm
0		5	14		**SANDY SILT (ML)**, gray, moist, loose	101	18.1	PID=30 ppm WASH
-5		6	6		very moist			PID=12 ppm PI
					Boring terminated at 26.5 feet. Groundwater was not encountered. Hole backfilled with soil from cuttings. Top 6 inches covered with cold asphalt patch.			

KLEINFELDER
Bright People. Right Solutions.

River Avenue Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

PLATE
A-3

PROJECT NO. 93788

LOG OF BORING B-2

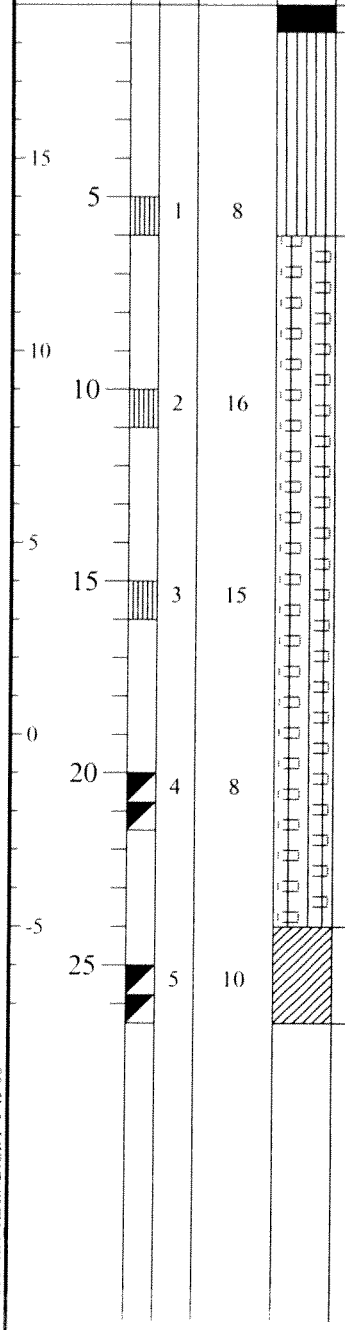
Drafted By: Reviewed By:

Legend To Logs On Plate A-1

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH DB STORM DRAIN GPJ KA RDLND.GDT 5.15.08

Date Drilled:	4/24/08	Water Depth:	>26.5
Drilled By:	CalPac	Date Measured:	4/24/08
Drilling Method:	HSA	Elevation:	19 feet (approx.)
Logged By:	YZ	Datum:	MSL



SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
Asphalt Concrete, 3-inch thick **Aggregate Base**, 5-inch thick **SANDY SILT (ML)**, gray, moist, some sandy clay			
loose	92	13.9	PID=20 ppm SHEAR
SILTY SAND (SM), gray brown, moist, loose to medium dense , fine- to coarse- grained.			
	95	13.6	PID=21 ppm WASH
			PID=18 ppm
			PID=13 ppm
SANDY CLAY (CL), gray, moist, stiff, fine- grained sand			PID=20 ppm PI
Boring terminated at 26.5 feet. Groundwater was not encountered. Hole backfilled with soil from cuttings. Top of 8 inches covered with cold asphalt patch.			

KLEINFELDER
Bright People. Right Solutions.

River Avenue Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

PLATE
A-4

PROJECT NO. 93788

LOG OF BORING B-3

Drafted By: Reviewed By:

Legend To Logs On Plate A-1

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH.DB STORM DRAIN.GPJ KA RDLND.GDT 5.15.08

Date Drilled:	4/24/08	Water Depth:	>26.5
Drilled By:	CalPac	Date Measured:	4/24/08
Drilling Method:	HSA	Elevation:	20 feet (approx.)
Logged By:	YZ	Datum:	MSL

Elevation (feet)	Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
			1			**Aspalt Concrete**, 3 -inches thick **Aggregate Base**, 4-inches thick **SILTY SAND (SM)**, gray, moist, fine- grained			PID=1 ppm
15	5		2	9		**SANDY CLAY (CL)**, gray, moist, medium stiff	92	15.3	PID=105 ppm PI
						SILTY SAND (SM), gray to gray brown, moist, loose, fine- to medium- grained			
10	10		3	13			94	10.4	PID=37 ppm SE
5	15		4	11					PID=20 ppm
0	20		5	12		medium dense.			PID=24 ppm WASH
-5	25		6	10		**SANDY CLAY**, gray, moist, stiff			PID=20 ppm
						Boring terminated at 26.5 feet. Groundwater was not encountered. Hole backfilled with soil from cuttings. Top of hole covered with cold asphalt patch.			

AIN.GPJ KA_RIDLND.GDT 5.15.08

KLEINFELDER
Bright People. Right Solutions.

River Avenue Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

PLATE
A-5

GEO.DT PROJECT NO. 93788

LOG OF BORING B-4

Drafted By: Reviewed By:

Legend To Logs On Plate A-1

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled:	4/24/08	Water Depth:	>26.5
Drilled By:	CalPac	Date Measured:	4/24/08
Drilling Method:	HSA	Elevation:	21 feet (approx.)
Logged By:	YZ	Datum:	MSL

Elevation (feet) / Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
20 / 0					**Asphalt Concrete**, 3-inches thick			
		1			**Aggregate Base**, 6-inches thick			PID=2 ppm
					SILTY SAND (SM), gray, moist, fine-grained			
5 / 15		2	7		loose, interbedded with sandy clay between 5 and 7 feet	92	9.5	PID=8 ppm WASH
10 / 10		3	14					PID=48 ppm
15 / 5		4	14		fine- to medium- grained	95	12.6	PID=33 ppm SHEAR
20 / 0		5	9					PID=52 ppm
25 / -5		6	5		**SANDY CLAY (CL)**, gray, moist, medium stiff, fine- grained sand			PID=17 ppm
					Boring terminated at 26.5 feet Groundwater was not encounteret. Hoel backfilled with soil from cuttings. Top 10 inches of hole covered with cold asphalt patch.			

KLEINFELDER
Bright People. Right Solutions.

River Avenue Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

PLATE
A-6

PROJECT NO. 93788

LOG OF BORING B-5

Drafted By: Reviewed By:

Legend To Logs On Plate A-1

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH DB STORM DRAIN.GPJ KA_RDLND.GDT 5/15/08

Date Drilled:	4/24/08	Water Depth:	>26.5
Drilled By:	CalPac	Date Measured:	4/24/08
Drilling Method:	HSA	Elevation:	22 feet (approx.)
Logged By:	YZ	Datum:	MSL

Elevation (feet) / Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
					Asphalt Concrete 5-inches thick **Aggregate Base** 4-inches thick			
20		1			**SANDY SILT (ML)**, gray to light gray, moist, fine- grained sand			PID=1 ppm MAX
5		2	9		**SILTY SAND (SM)**, gray, moist, loose, fine- grained	93	10.8	PID=23 ppm
15								
10		3	14			97	13.1	PID=31 ppm CHEM, SE
10								
15		4	24		medium dense			PID=20 ppm WASH
5								
20		5	7		**SANDY CLAY (CL)**, gray, moist, medium stiff, fine- grained sand			PID=15 ppm PI
0					**SILTY SAND (SM)**, gray, moist to very moist, medium dense, fine- to medium- grained			
25		6	22					PID=19 ppm
					Boring terminated at 26.5 feet. Groundwater was not encountered. Hole backfilled with soil from cuttings. Top 10 inches of hole covered with cold asphalt patch.			

GEOTECH DB STORM DRAIN GPJ KA RDLND.GDT 5/15/08

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO. 93788

River Avenue Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

PLATE
A-7

LOG OF BORING B-6

Drafted By: Reviewed By:

Legend To Logs On Plate A-1

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

APPENDIX B

LABORATORY TESTING

APPENDIX B
LABORATORY TESTING

Laboratory tests were performed on representative drive and bulk soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with one of the following references:

1) Lambe, T. William, Soil Testing for Engineers, Wiley, New York, 1951.
2) Laboratory Soils Testing, U.S. Army, Office of the Chief of Engineers, Engineering Manual No. 1110-2-1906, November 30, 1970.
3) ASTM Standards for Soil Testing, latest revisions.
4) State of California Department of Transportation, Standard Test Methods, latest revisions.

LABORATORY MOISTURE AND DENSITY DETERMINATIONS

Natural moisture content and dry density test were performed on samples collected from the borings. Moisture content was evaluated in general accordance with ASTM Test Method D 2216; dry unit weight was evaluated using procedures similar to ASTM Test Method D 2937. The result are presented on the Logs of Borings and Test Pits and summarized in Table B-1.

GRAIN SIZE DISTRIBUTION

The grain size distribution of selected soil samples was performed by wash sieving in general accordance with ASTM Standard Test Method D422-63. The test results are presented in Table B-2.

PLASTICITY INDEX

Plasticity index tests were performed on selected samples to aid in soil classification and to evaluate the plasticity characteristics of the material. Testing was performed in general accordance with ASTM Test Method D 4318. The results are presented on Plate B-1.

DIRECT SHEAR TEST

Direct shear test was performed on three selected samples to evaluate the drained shear strength of the soils. The samples were soaked and tested in a near-saturated condition in accordance with ASTM Test Method D-3080 (consolidated, drained). The results are presented on Plates
B-2, B-3, and B-4.

SAND EQUIVALENT

Sand equivalent test were performed on selected samples in general accordance with California Test 217. The results of these tests are summarized in Table B-3, Sand Equivalent.

CORROSION TEST

Two selected sample of the on-site soils were tested for pH, resistivity, soluble chlorides and soluble sulfates in general accordance with California Test Method 643, 422, and 417, respectively. The test results are presented in Table B-4.

MAXIMUM DENSITY/OPTIMUM MOISTURE TEST

Two maximum density/optimum moisture tests were performed on selected bulk samples of the on-site soils to determine compaction characteristics. The tests were performed in accordance with ASTM Standard Test Method D-1557. The test results are presented in Table B-5.

KLEINFELDER
Bright People. Right Solutions.

TABLE B-1 MOISTURE CONTENT/DRY DENSITY TEST RESULTS

PROJECT: River Avenue Drain Phase II SAMPLED BY: YZ DATE: 4/24/2008

PROJECT #: 93788 TESTED BY: AT DATE: 5/1/2008

REMARKS: CHECKED BY: MPS DATE: 5/14/2008

Boring	Depth (ft)	Mositure Content (%)	Dry Density (pcf)
B-1	5	12.2	97
B-1	10	11.7	95
B-1	15	13.6	98
B-2	5	10.6	92
B-2	15	14.5	108
B-2	20	18.1	101
B-3	5	13.9	92
B-3	10	13.6	95
B-4	5	15.3	92
B-4	10	10.4	94
B-5	5	9.5	95
B-5	15	12.6	97
B-6	5	10.8	93
B-6	10	13.1	99

Performed in general accordance with ASTM D 2216 and D 2937.

KLEINFELDER

TABLE B-2 PERCENT PASSING #200 SIEVE TEST RESULTS

PROJECT: River Avenue Drain Phase II SAMPLED BY: YZ DATE: 4/24/2008

PROJECT #: 93788 TESTED BY: AP DATE: 5/12/2008

REMARKS: CHECKED BY: MPS DATE: 5/14/2008

SAMPLE LOCATION	SAMPLE DEPTH (FT)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS (TOTAL SAMPLE)
B-1	20	SILTY SAND	100	26	SM
B-1	40	SAND with SILT	100	5	SP-SM
B-2	40	SANDY SILT	100	58	ML
B-3	10	SILTY SAND	100	32	SM
B-4	20	SILTY SAND	100	28	SM
B-6	15	SILTY SAND	100	37	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

KLEINFELDER
Bright People. Right Solutions.

TABLE B-3 SAND EQUIVALENT TEST RESULTS

PROJECT: River Avenue Drain Phase II SAMPLED BY: YZ DATE: 4/24/2008

PROJECT #: 93788 TESTED BY: AT DATE: 5/8/2008

REMARKS: CHECKED BY: MPS DATE: 5/14/2008

Boring	Depth (ft)	Sand Equivalent
B-1	20	24
B-2	10	28
B-4	10	25
B-6	10	23

Performed in general accordance with California Test 217.

KLEINFELDER
Bright People. Right Solutions.

PRJECT: River Avenue Drain Phase II

PROJECT #: 93788

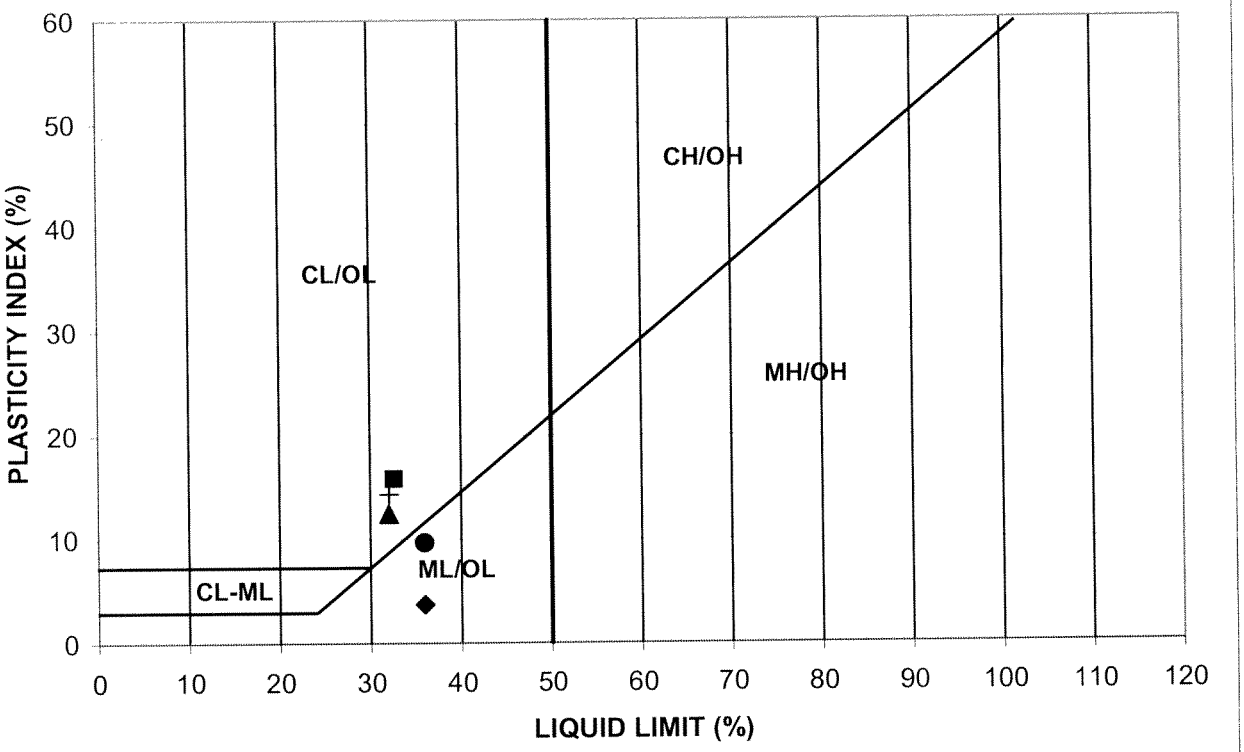
TABLE B-4 CORROSION TEST Results

Boring	Depth (ft)	pH	Sulfate (ppm)	Chloride (ppm)	Resistivity (ohm-cm)
B-2	4 – 6	8.57	36	82	4,900
B-6	10 - 11	8.20	75	124	5,100

TABLE B-5 MAXIMUM DENSITY/OPTIMUM MOISTURE CONTENT TEST RESULTS

Boring	Depth (ft)	Optimum Moisture Content (%)	Maximum Dry Density (pcf)
B-2	1 – 5	8.0	120
B-6	1 – 5	8.5	122

PLASTICITY CHART



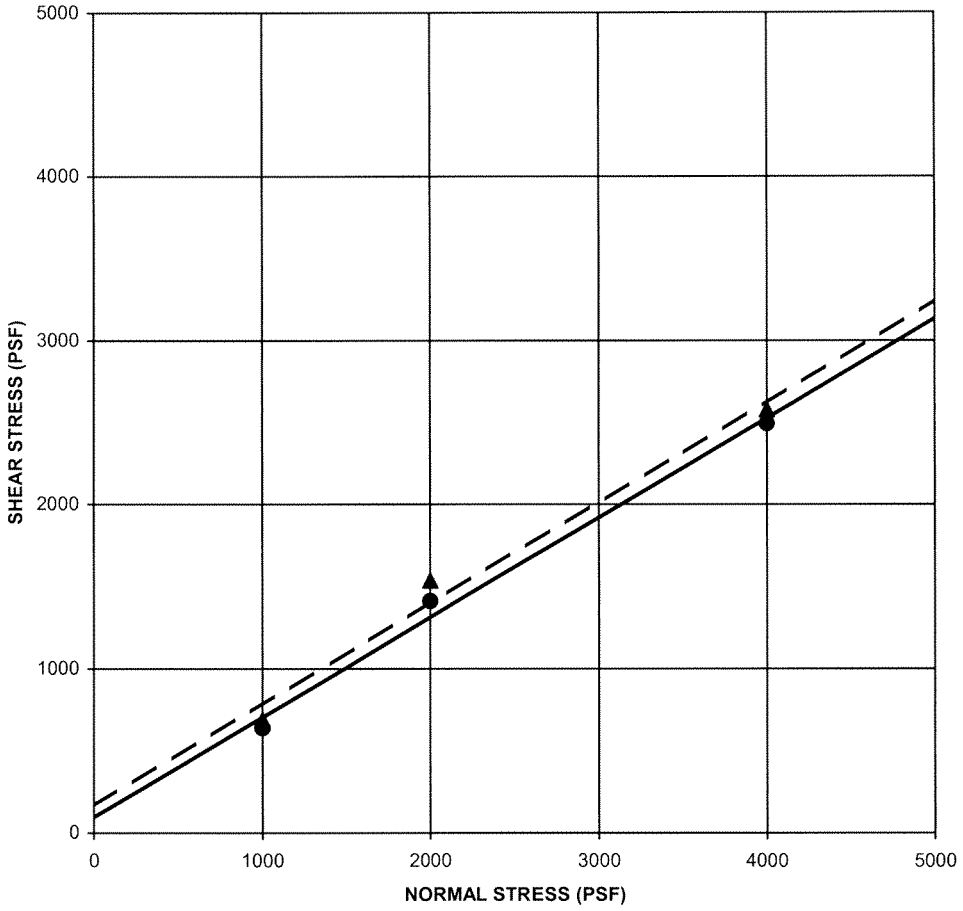
SYMBOL	SAMPLE IDENTIFICATION			ATTERBERG LIMITS			SOIL CLASSIFICATION	USCS TOTAL SAMPLE
	BORING NO.	SAMPLE NO.	DEPTH (ft)	LL	PL	PI		
♦	B-1	1	5	36	32	4	SANDY SILT	ML
●	B-2	6	25	36	26	10	SANDY SILT	ML
▲	B-3	5	25	32	20	12	SANDY CLAY	CL
+	B-4	2	5	32	18	14	SANDY CLAY	CL
■	B-6	5	20	33	17	16	SANDY CLAY	CL

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO. 93788

River Avenue Drain Phase II Project
River Avenue and McHelen Avenue
Long Beach, California
PLASTICITY INDEX TEST

PLATE
B-1



SYMBOL		BORING NO.	SAMPLE NO.	DEPTH (ft)	COHESION (psf)	FRICTION ANGLE (deg)	SOIL CLASSIFICATION	USCS TOTAL SAMPLE
PEAK	●	B-1	2	10	100	31	Silty Sand	SM
ULTIMATE	▲	B-1	2	10	170	32	Silty Sand	SM

INITIAL MOISTURE(%):	12.2
INITIAL DRY DENSTIY(PCF):	97
FINAL MOISTURE(%):	15.9

Normal Stress (psf)	1000	2000	4000
Peak Stress (psf)	640	1410	2495
Ultimate Stress (psf)	690	1535	2580

KLEINFELDER

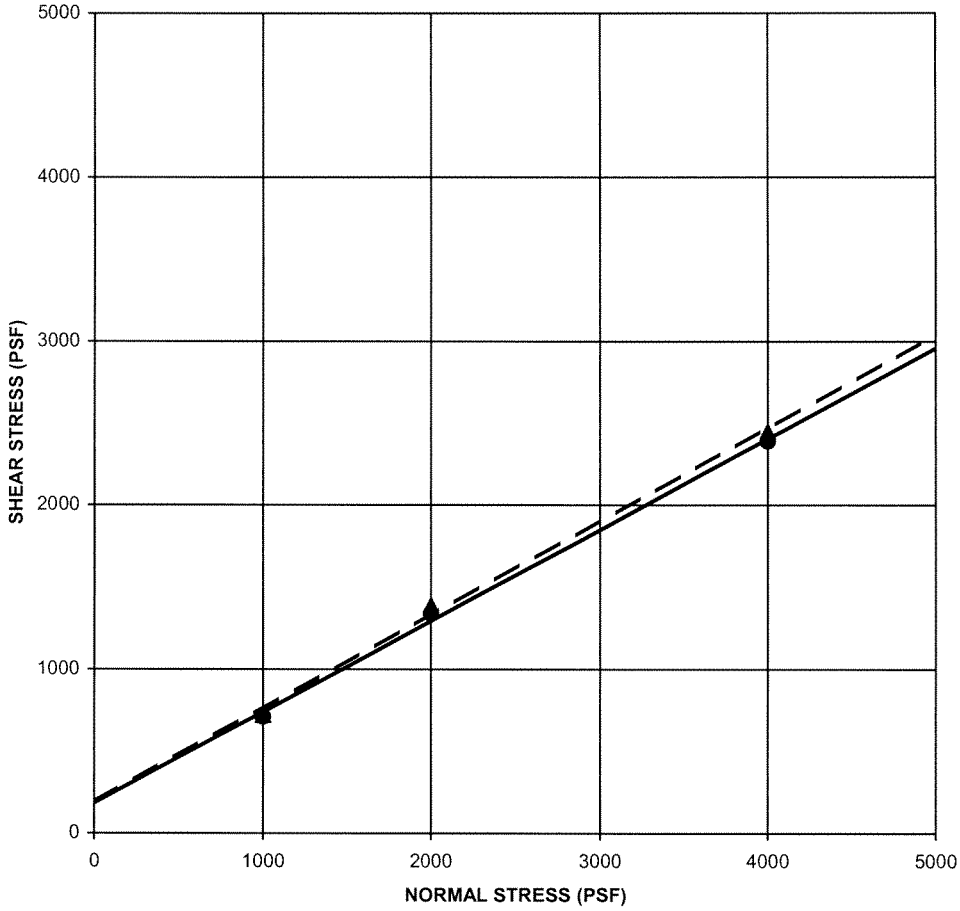
PROJECT NO. 93788

River Avenue Storm Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

DIRECT SHEAR TEST

PLATE

B-2



SYMBOL		BORING NO.	SAMPLE NO.	DEPTH (ft)	COHESION (psf)	FRICTION ANGLE (deg)	SOIL CLASSIFICATION	USCS TOTAL SAMPLE
PEAK	●	B-3	1	5	190	29	Sandy Silt	ML
ULTIMATE	▲	B-3	1	5	190	30	Sandy Silt	ML

INITIAL MOISTURE(%):	13.9
INITIAL DRY DENSTIY(PCF):	92
FINAL MOISTURE(%):	16.8

Normal Stress (psf)	1000	2000	4000
Peak Stress (psf)	710	1340	2390
Ultimate Stress (psf)	720	1390	2450

KLEINFELDER
Bright People. Right Solutions.

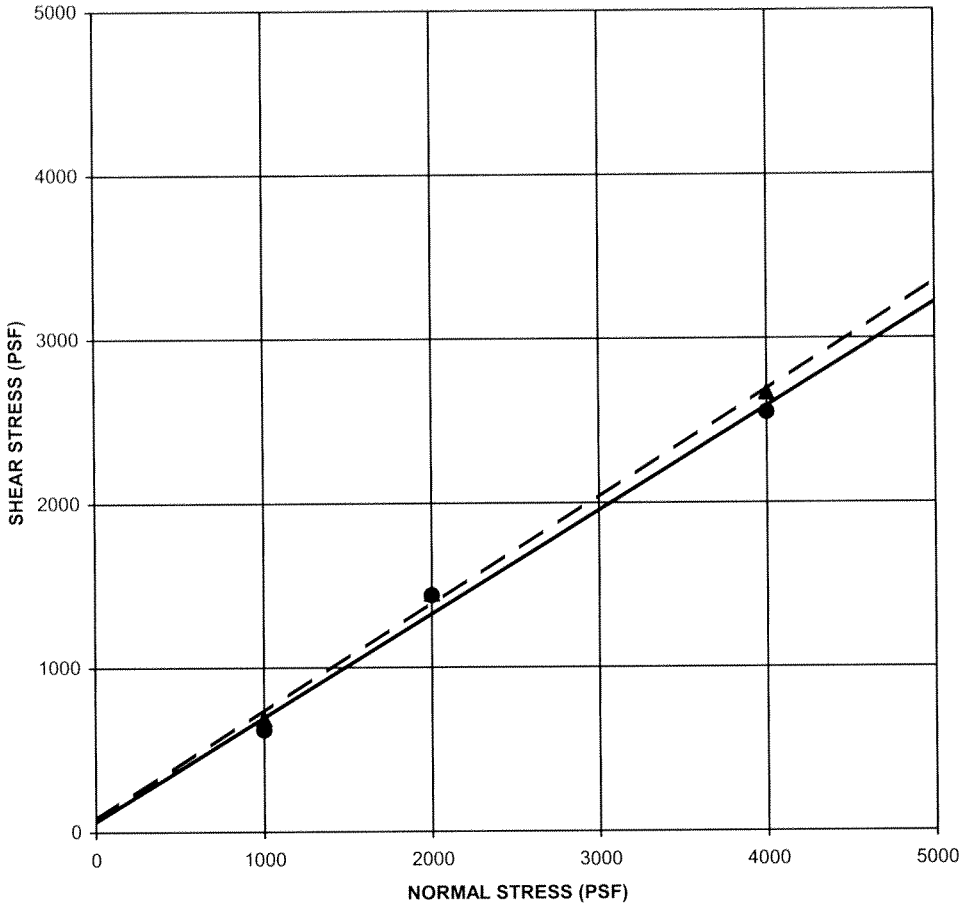
PROJECT NO. 93788

River Avenue Storm Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

DIRECT SHEAR TEST

PLATE

B-3



SYMBOL		BORING NO.	SAMPLE NO.	DEPTH (ft)	COHESION (psf)	FRICTION ANGLE (deg)	SOIL CLASSIFICATION	USCS TOTAL SAMPLE
PEAK	●	B-5	4	15	60	32	Silty Sand	SM
ULTIMATE	▲	B-5	4	15	80	33	Silty Sand	SM

INITIAL MOISTURE(%):	12.6
INITIAL DRY DENSTIY(PCF):	95
FINAL MOISTURE(%):	14.1

Normal Stress (psf)	1000	2000	4000
Peak Stress (psf)	620	1440	2550
Ultimate Stress (psf)	690	1450	2670

KLEINFELDER
Right Now, for Right Solutions

PROJECT NO. 93788

River Avenue Storm Drain Phase II
River Avenue and McHelen Avenue
Long Beach, California

DIRECT SHEAR TEST

PLATE

B-4

APPENDIX C

ENGINEERING ANALYSIS

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED SETTLEMENTS USING SPT DATA

EZ_SPT HQ v 2.0

PROJECT INFORMATION	
Project Name	River Avenue Storm Drain Phase II
Project No.	03788
Location	River Avenue & McHelen Avenue, Long Beach
Exploration No.	B-1

GENERAL INPUT DATA	
Ground Surf. Elev., During Test	100.00 ft
GWT Elev., During Test	75.00 ft
GWT Elev., For Design	80.00 ft
Total Soil Unit Weight, γ_t	110.00 pcf
Earthquake Magnitude, M_{sp}	7.(6)
Peak Ground Acceleration, A_{max}	0.5(1) g
Required Factor of Safety	1.10

SPT CORRECTION FACTORS ++	
For Hammer Energy Ratio, C_E	1.00
For Borehole Diameter, C_B	1.15
For Rod Length, C_R	0.85
For Sampling Method, C_S	1.00

REFERENCES

\+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ Combined corrrection factor for hammer energy ratio (C_E), borehole diameter (C_B), rod length (C_R), and sampling method (C_S) = C_E C_B C_R C_S

+++ CSR = 0.65 A_{max} (σ_v/σ_v') r_d

* FS = (CRR or CSR) MSF K_σ K_α where K_α = 1.0 and MSF = 1.19

** Residual strength values of liquefied soils are evaluated using the median curve by Seed & Harder (1990)

*** Ground settlements are evaluated using the method developed by Tokimatsu and Seed (1987).

Note: This analysis assumes level ground condition and depth of liquefiable soils does not change.

GWT Depth During Test, Zw = 25.00 ft below ground surface

GWT Depth For Design, Zwd = 20.00 ft below ground surface

***** SUMMARY OF RESULTS *****

Total Thickness of Liquefiable Soils = 4.00 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement = 0.54 inches <--- Saturated Sands
- Seismic Compaction Settlement = 0.88 inches <--- Dry or Unsaturated Sands

Total: 1.42 inches

INPUT SOIL PROFILE (BORING DATA)

Soil Depth During Test Z_t (ft)	Layer Thickness H (ft)	USCS Soil Type	Equivalent SPT Blow Count N_1 (blows/ft)	Fines Content FC (%)
19.0	19.0	SM	9.0	26.0
23.0	4.0	SM	21.0	26.0
28.0	5.0	SP-SM	36.0	5.0
33.0	5.0	SP-SM	37.0	5.0
38.0	5.0	SP-SM	39.0	5.0
43.0	5.0	SP-SM	44.0	5.0
48.0	5.0	SP-SM	43.0	5.0
51.0	3.0	SP-SM	45.0	5.0

SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +

Bottom of Layer Elevation (ft)	Total Vert. Stress σ_v (psf)	Effective Vert. Stress (Design) σ_v' (psf)	Effective Vert. Stress (Test) σ_v' (psf)	SPT Stress Correction Factor+ C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff.+ r_d	Correction for High Overburden Stress+ K_σ	Cyclic Stress Ratio++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction * FS	Liquefy ?
71.5	2090	2090	2091	0.978	8.6	14.0	0.956	0.990	0.311	N/A	N/A	NO
75.0	2550	2343	2530	0.889	18.3	34.9	0.946	0.951	0.332	0.289	0.868	YES
69.5	3080	2581	2893	0.831	29.3	29.3	0.935	0.903	0.363	0.423	1.257	NO
64.5	3630	2819	3431	0.799	28.9	28.9	0.905	0.872	0.379	0.406	1.114	NO
59.5	4180	3057	3969	0.771	29.4	29.4	0.865	0.844	0.384	0.429	1.124	NO
54.5	4730	3295	4507	0.745	32.0	32.0	0.824	0.819	0.384	N/A	N/A	NO
49.5	5280	3533	5045	0.721	30.3	30.3	0.783	0.796	0.380	N/A	N/A	NO
47.5	5610	3676	5388	0.708	31.2	31.2	0.759	0.784	0.376	N/A	N/A	NO

RESIDUAL STRENGTH **

SPT Blow Count Correction N_{corr}	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)
N/A	N/A	N/A
2.1	20.3	3800
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

GROUND SETTLEMENT ***

Cyclic Shear Strain ** γ_c (%)	Vol. Strain ** ε_v (%)	Layer Settlement ** S_l (in.)	Cumulative Settlement Profile (in.)
0.140	0.585	0.88	1.42
0.357	0.17	0.24	0.54
0.098	0.06	0.08	0.30
0.148	0.09	0.09	0.22
0.139	0.08	0.01	0.13
0.079	0.05	0.02	0.12
0.094	0.06	0.01	0.10
0.085	0.05	0.09	0.09

KLEINFELDER
Bright People. Right Solutions.

Sheet 1 of 1

PROJECT RIVER AVE DRAIN PROJECT NO. 93788

SUBJECT EARTH PRESSURES BY MPS DATE 5/14/08

REVIEWED BY DATE

1/ Rigid System - Active

$P_a = 0.8 * K_a \cdot \gamma \cdot H$

$K_a = \tan^2(45 - \phi/2)$

For $\phi = 30°$, $\gamma = 120$ pcf

$P_a = 0.8 \cdot 0.33 \cdot 120 \cdot H = 31.7H$

Use $P_a = 32H$ (psf)

2/ Flexible System (cantilevered) – Active

$P_a = \underbrace{0.33}_{K_a} \cdot \underbrace{120}_{\gamma} \cdot H = 40H$ (psf)

Passive Pressure

$P_p = K_p \cdot \gamma \cdot Z$

$K_p = \tan^2(45 + \phi/2) \Rightarrow$ for $\phi = 30° \Rightarrow K_p = 3$

$P_p = 3 \cdot 120 \cdot Z = 360Z$ (ultimate)

Use Factor of safety 1.3 (temporary shoring)

$P_p = \frac{360}{1.3} \cdot Z = 277 \cdot Z$

Say $P_p = 275 \cdot Z$ (psf)

APPENDIX C:
Phase I Environmental Site Assessment

KLEINFELDER
Bright People. Right Solutions.

620 West 16th Street, Unit F
Long Beach, CA
90813

p| 562.432.1696
f | 562.432.1796

kleinfelder.com

May 16, 2008
File No. 93788/1

Mr. Frank Sanchez, P.E.
City of Long Beach
Department of Public Works
Bureau of Engineering/Project Management Division
333 West Ocean Boulevard, 9th Floor
Long Beach, California 90802

Subject: Phase I Environmental Site Assessment
Proposed River Avenue Drain Phase II Project
Long Beach, California

Dear Mr. Sanchez:

Enclosed is the Phase I Environmental Site Assessment (ESA) report for the above-referenced property. We trust the information presented in this report meets your need at this time.

An executive summary is provided; however, we recommend that the report be read in its entirety for a comprehensive understanding of the items contained therein.

We appreciate the opportunity to provide these services for the City of Long Beach. Should you require additional information, or have questions regarding this report, please contact the undersigned at (562) 432-1696.

Respectfully submitted,

KLEINFELDER

Paolo M. Dizon, REA
Environmental Scientist

Herbert "Bert" A. Vogler III, PG
Senior Hydrogeologist

PHASE I ENVIRONMENTAL SITE ASSESSMENT PROPOSED RIVER AVENUE DRAIN PHASE II PROJECT LONG BEACH, CALIFORNIA

May 16, 2008

A Report Prepared for:

City of Long Beach
Department of Public Works
Bureau of Engineering/Project Management Division
333 West Ocean Boulevard, 9th Floor
Long Beach, California 90802

PHASE I ENVIRONMENTAL SITE ASSESSMENT
PROPOSED RIVER AVENUE DRAIN PHASE II PROJECT
LONG BEACH, CALIFORNIA

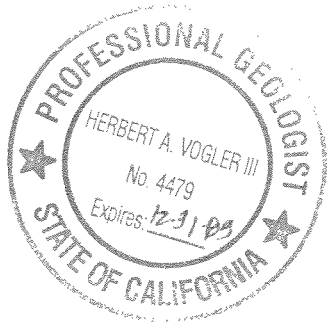
Kleinfelder Job No. 93788/1

Prepared by:

Paolo M. Dizon, REA
Environmental Scientist

Reviewed by:

Herbert "Bert" A. Vogler III, PG
Senior Hydrogeologist



KLEINFELDER
620 West 16th Street, Unit F
Long Beach, California 90813

May 16, 2008

KLEINFELDER
Bright People. Right Solutions.

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLES

TABLE OF CONTENTS (continued)

Section

PLATES

APPENDICES

1.0 EXECUTIVE SUMMARY

A Phase I Environmental Site Assessment (ESA) was performed for the City of Long Bach (Client) of the property referred to as the Proposed River Avenue Drain Phase II Project (Site; see Plate 1, Site Location Map), in the City of Long Beach, California. This report was prepared using the American Society for Testing and Materials (ASTM) Standard E 1527-05, "*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*" (the ASTM Standard). The Phase I ESA findings include:

- The Site includes an approximately 1,800-foot length of River Avenue and McHelen Avenue, which are contiguous asphalt-paved roadways. In addition, the southern portion of the Site, beyond the terminus of River Avenue, consists of an approximately 100-foot by 250-foot area located within a parcel presently used as a plant nursery by Orange County Nursery, Inc.

- A review of available historical information indicates that River Avenue, from the intersection of River Avenue and West Wardlow Road to its southern terminus, was paved from at least 1928. McHelen Avenue was paved from at least 1947. The portion of the Site located within the parcel occupied by Orange County Nursery, Inc. remained undeveloped up to at least 1994, prior to its subsequent development as a plant nursery.

- No obvious indications were observed during the Site reconnaissance that a release of hazardous materials/wastes or petroleum products has occurred at the Site.

- Kleinfelder identified no indication that pesticide application was performed on the portion of the Site located within the plant nursery, but the possibility of the use of pesticides at the Site cannot be ruled out. It is Kleinfelder's opinion that the plant nursery at the Site represents a potential recognized environmental condition (REC) to the Site.

- There are several petroleum pipelines reported to be located in the Site vicinity. Kleinfelder requested information concerning these pipelines from the owners, but has not received replies. The exact locations of these pipelines have therefore not been identified by Kleinfelder, but if they are located within or

immediately adjoining the Site and leaks have occurred, they would represent a REC.

- No current or historic off-Site facilities constituting RECs to the Site were identified during this Phase I ESA.

Kleinfelder's Phase I ESA did not reveal evidence of identified RECs, historical environmental conditions, or *de minimus* conditions. However, Kleinfelder's Phase I ESA revealed evidence of the following potential RECs:

- A portion of the Site is located within a plant nursery. Although not confirmed, it is possible that pesticides may have been used at the Site and released to the subsurface, which represents a potential REC.

- Several petroleum pipelines are reported to be located in the Site vicinity. Kleinfelder requested information concerning these pipelines from the owners, but has not received replies. The exact locations of these pipelines have therefore not been identified by Kleinfelder, but if they are located within or immediately adjoining to the Site and leaks have occurred, they would represent a REC.

In addition to these potential RECs, deviations are discussed in Chapter 8 of this report. This report is subject to the limitations in Section 2.5.

2.0 INTRODUCTION

The following report is a summary of work performed using the guidelines set forth in the ASTM Standard E 1527-05, *"Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process"* (the ASTM Standard). This report also generally conforms to the ASTM Standard's suggested table of contents. Minor format modifications have been made to the ASTM Standard's suggested table of contents to assist in better reading and understanding the report findings.

2.1 PURPOSE

The purpose of this Phase I ESA is to identify, to the extent feasible pursuant to the scope of work defined in our Proposal number 05809PROP/LBE7P050, dated July 6, 2007, and limitations discussed in this report, RECs and other environmental issues related to the Site. As defined in the ASTM Standard, a REC is:

> *The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include* de minimis *conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be* de minimis *are not recognized environmental conditions.*

This report describes Kleinfelder's assessment methodology and documents our assessment findings, subject to the limitations presented in Section 2.5 of this report.

2.2 DETAILED SCOPE-OF-SERVICES

The following sections describe Kleinfelder's work scope:

- Section 2, **Introduction**, includes a discussion of the purpose/reason for performing the Phase I ESA, additional services requested by the Client (e.g., an evaluation of business environmental risk factors associated with the Site), significant assumptions (e.g., property boundaries if not marked in the field), limitations, exceptions, special terms and conditions (e.g., contractual), and user reliance parameters.

- Section 3, **Site Description**, is a compilation of information concerning the Site location, legal description (if provided), current and proposed use of the Site, a description of structures and improvements on the Site at the time of Kleinfelder's assessment, and adjoining property use.

- Section 4, **Records Review**, is a compilation of Kleinfelder's review of several databases available from federal, state, and local regulatory agencies regarding hazardous substance use, storage, or disposal at the Site; and for off-Site facilities within the search distances specified in the ASTM Standard. Records provided by the Client are summarized and copies of relevant documents are included in the appendices of this report. Physical setting sources (including topography and soil and groundwater conditions) and typical Client-provided information (e.g., title records, environmental liens, specialized knowledge, valuation reduction for environmental issues, and owner, property manager, and occupant information) are also summarized in this section. Other interviews with people knowledgeable about the Site (including the Client) are included in Section 7.

- Section 5, **History of the Site**, summarizes the history of the Site and adjoining properties. This Site history is based on various sources which may include a review of historical aerial photographs, Sanborn Fire Insurance Maps, city or suburban directories, historical topographic maps, building department records, and results of previous Site assessments.

- Section 6, **Site Reconnaissance**, describes Kleinfelder's observations during the Site reconnaissance. The methodology used and limiting conditions are described.

- Section 7, **Interviews**, is a summary of telephone and personal interviews conducted with "Key Site Managers" that may include the Site owner/manager, occupants/tenants, local government officials, and the Client. Additional interview sources may be contacted if "Key Site Managers" are not available prior to production of this report, and may include adjoining landowners and people with historical knowledge of the area.

- Section 8, **Evaluation**, is a presentation of our findings and opinions regarding the information in Sections 3 through 7, and presents our conclusions regarding the presence of RECs connected with the Site, and recommendations.

- Section 9, **References**, is a summary of some of the resources used to compile this report.

Pertinent documentation regarding the Site is included in appendices of this report.

2.3 ADDITIONAL SERVICES

An evaluation of business environmental risk associated with the Site was not included in Kleinfelder's scope of work. The scope of this ESA does not incorporate ASTM Standard non-scope considerations, such as asbestos-containing materials, radon, lead-based paint, lead in drinking water, wetlands, regulatory compliance, cultural and historical resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality, and high voltage power lines.

2.4 SIGNIFICANT ASSUMPTIONS

Kleinfelder assumes the accuracy of the subcontracted regulatory agency database search report (Appendix B). Kleinfelder also assumes the property owner and/or Client provided all applicable and available environmental records and specialized knowledge regarding the Site. Kleinfelder has not made other significant assumptions during the performance of this Phase I ESA.

2.5 LIMITATIONS AND EXCEPTIONS

Phase I ESAs are non-comprehensive by nature and may not identify all environmental problems, and will not eliminate all risk. This report is a qualitative assessment. Kleinfelder offers a range of investigative and engineering services to suit the needs of our clients, including more quantitative investigations. Although risk can never be eliminated, more detailed and extensive investigations yield more information, which may help the Client understand and better manage risks. Since such detailed services involve greater expense, we ask our clients to participate in identifying the level of service, which will provide them with an acceptable level of risk. Please contact the signatories of this report if you would like to discuss this issue of risk further.

Kleinfelder performed this Phase I ESA in general accordance with the guidelines set forth in the ASTM Standard, and the proposed scope subsequently approved by our Client. No warranty, either expressed or implied, is made. Environmental issues not specifically addressed in this report were beyond the scope of our services and not included in our evaluation.

This report may be used only by the Client and only for the purposes stated within a reasonable time from its issuance, *but in no event later than 1 year from the date of the report.* Land or facility use, on- and off-Site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Since Site activities and regulations beyond our control could change at any time after the completion of this report, our observations, findings, and opinions can be considered valid only as of the date of the Site visit. This report should not be relied upon after 180 days from the date of its issuance (pursuant to the ASTM Standard's Section 4.6). Any party other than the Client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party, and Client agrees to defend, indemnify, and hold harmless Kleinfelder from any claim or liability associated with such unauthorized use or non-compliance.

2.6 SPECIAL TERMS AND CONDITIONS

No special terms and conditions in addition to those discussed in our Proposal Number 05809PROP/LBE7P050, dated July 6, 2007, were agreed to by the Client and Kleinfelder.

3.0 SITE DESCRIPTION

The Site description is presented in this section and describes the condition of the Site at the time of the Phase I ESA. The Site location is shown on Plate 1. Tables 3-1 through 3-4 summarize the physical characteristics of the Site and adjoining properties.

3.1 LOCATION AND LEGAL DESCRIPTION

The information presented in Table 3-1 describes the physical location and legal description of the Site. This information was obtained from review of various maps (such as topographic maps and tax assessor maps), aerial photographs, public records at city and/or county offices, interviews, and/or information provided by the Client.

TABLE 3-1
LOCATION AND LEGAL DESCRIPTION

Parameter	Information/Comments
LOCATION	The Site is located along River Avenue and McHelen Avenue, extending from the intersection of East 221st Place and McHelen Avenue southward to, and including, a portion of a parcel adjoining the southern terminus of River Avenue. The Site is in the City of Long Beach, California.
ASSESSOR'S PARCEL NO.	The parcel adjoining the southern terminus of River Avenue is assigned Assessor's Parcel Number (APN) 7317-015-800 by the County of Los Angeles. There is no APN assigned to the portion of the Site along River Avenue and McHelen Avenue.
ADDRESS	There is no address for the portion of the Site along River Avenue and McHelen Avenue. APN 7317-015-800 has an assigned address of 3628 Webster Avenue.
TOWNSHIP & RANGE	Township 4 South, Range 13 West, Section 15, San Bernardino Baseline and Meridian.
ACREAGE	The portion of the Site along River Avenue and McHelen Avenues consists of approximately 1,800 linear feet. The portion of the Site located within APN 7317-015-800 occupies an area of approximately 100 feet by 250 feet.

3.2 CURRENT / PROPOSED USE OF THE PROPERTY

The Site includes an approximately 1,800-foot length of River Avenue and McHelen Avenue, which are contiguous asphalt-paved roadways. In addition, the southern portion of the Site consists of an approximately 100-foot by 250-foot area located within a parcel presently used as a plant nursery by Orange County Nursery, Inc. The Site is located in the City of Long Beach, California. At the time of Kleinfelder's assessment, land use in the general vicinity appeared to be commercial and residential. Current and proposed uses are described in Table 3-2.

TABLE 3-2
CURRENT / PROPOSED USES

Parameter	General Observations
CURRENT USE	The Site presently consists of active roadway and a portion of a plant nursery.
PROPOSED USE	Kleinfelder understands that the Client plans to construct a new storm drain along River Avenue and McHelen Avenue (contiguous roadways), starting from approximately the intersection of McHelen Avenue and East 223rd Place, to the southern terminus of River Avenue. The total length of the proposed storm drain alignment is approximately 1,800 feet. In addition, an approximately 100-foot by 250-foot detention basin is to be constructed within the Site portion of APN 7317-015-800 (where the plant nursery is presently located).

3.3 DESCRIPTION OF STRUCTURES / IMPROVEMENTS

Structures and/or improvements observed on the Site at the time of Kleinfelder's Site reconnaissance are described in Table 3-3.

TABLE 3-3
STRUCTURES / IMPROVEMENTS

Parameter	General Observations
STRUCTURES	There are presently no buildings located on the Site.
IMPROVEMENTS	River Avenue and McHelen Avenue together are an active roadway paved with asphalt. The portion of the Site occupying part of APN 7317-015-800 is currently developed as a plant nursery.

3.4 CURRENT USES OF ADJOINING PROPERTIES

Kleinfelder performed a brief drive-by survey of the properties immediately adjoining to the Site on April 24, 2008. A summary of the surrounding properties is presented in Table 3-4.

TABLE 3-4
ADJOINING PROPERTIES

Direction	Land Use Description
NORTH	The Site is bounded by East 221st Place to the north, beyond which are residences.
SOUTH	The Site is bounded by the plant nursery, beyond which is a Southern California Edison (SCE) substation.
EAST	The Site is bounded by the plant nursery and residences, beyond which are additional residences and a trailer park.
WEST	The Site is bounded by a plant nursery, residences, and a church. Farther west of the plant nursery is a Union Pacific Intermodal Container Transfer Facility.

Hazardous materials and petroleum products were not observed to be stored on properties directly adjoining the Site. No other environmental conditions were apparent on the adjoining properties at the time of Kleinfelder's Site reconnaissance. Based on our observations, the adjoining properties are not likely to adversely affect environmental conditions at the Site.

4.0 RECORDS REVIEW

4.1 STANDARD ENVIRONMENTAL RECORD SOURCES

The purpose of the records review is to obtain and review records that would help to evaluate RECs in connection with the Site and bordering properties.

Federal, state, and local regulatory agencies publish databases or 'lists' of businesses and properties that handle hazardous materials or hazardous waste, or are the known location of a release of hazardous substances to soil and/or groundwater. These databases are available for review and/or purchase at the regulatory agencies, or the information may be obtained through a commercial database service. Kleinfelder contracted a commercial database service, Environmental Data Resources, Inc. (EDR), of Milford, Connecticut, to perform the government database search for listings within the appropriate ASTM Standard minimum search distance of the Site. EDR also searches proprietary databases it maintains for listings. The EDR database search results, a description of the types of information contained in each of the databases reviewed, the agency responsible for compiling the data in each database, and locations of the listed facilities are included in the EDR DataMap® Area Study, which is presented in Appendix B.

4.2 STANDARD ENVIRONMENTAL RECORD SOURCES

The following sections include summary tables presenting the results of EDR's record search. Databases with listings identified by EDR are discussed further, following each of the summary tables. The EDR DataMap® Area Study in Appendix B has a discussion of the databases that contained no listings.

4.2.1 Federal Agency Records Review

The results of the federal agency records review are summarized in Table 4-1 and the text that follows.

TABLE 4-1
FEDERAL RECORDS REVIEWED

Database Searched	Site Listing	Adjoining Listings	Other Listings within 0.25-Mile	Listings within 0.25-0.50-Mile	Listings within 0.5-1.0 Mile
NPL	No	No	No	No	No
Proposed NPL	No	No	No	No	No
Delisted NPL	No	No	No	No	No
NPL Liens	No	No	No	No	No
CERCLIS	No	No	No	2	No
CERCLIS-NFRAP	No	No	No	1	3
LIENS 2	No	No	No	No	No
CORRACTS	No	No	No	1	4
RCRA-TSDF	No	No	No	1	3
RCRA-LQG	No	No	No	No	1
RCRA-SQG	No	No	No	2	2
RCRA-CESQG	No	No	No	No	No
RCRA-NonGen	No	No	No	No	1
US ENG CONTROLS	No	No	No	No	No
US INST CONTROLS	No	No	No	No	No
ERNS	No	No	No	No	No
HMIRS	No	No	No	No	No
DOT OPS	No	No	No	No	No
US CDL	No	No	No	No	No
US Brownfields	No	No	No	No	No
DOD	No	No	No	No	No
FUDS	No	No	No	No	No
LUCIS	No	No	No	No	No
CONSENT	No	No	No	No	No
ROD	No	No	No	No	No
UMTRA	No	No	No	No	No
ODI	No	No	No	No	No
Debris Region 9	No	No	No	No	No
MINES	No	No	No	No	No

TABLE 4-1 (continued)
FEDERAL RECORDS REVIEWED

Database Searched	Site Listing	Adjoining Listings	Other Listings within 0.25-Mile	Listings within 0.25-0.50-Mile	Listings within 0.5-1.0 Mile
TRIS	No	No	No	No	1
TSCA	No	No	No	No	No
FTTS	No	No	No	No	No
HIST FTTS	No	No	No	No	No
SSTS	No	No	No	No	No
ICIS	No	No	No	No	No
PADS	No	No	No	No	No
MLTS	No	No	No	No	No
RADINFO	No	No	No	No	No
FINDS	No	No	No	3	4
RAATS	No	No	No	No	No

The Site was not listed in the searched federal databases. Listed off-Site facilities are discussed below.

CERCLIS – The CERCLIS List is a compilation of facilities reported to the US EPA that have been investigated or are under investigation for a release or potential release of hazardous materials. Two off-Site facilities are listed in the CERCLIS Database. "Raytheon Systems Co" at 1500 Cabot Way and "Alameda St San Ldfl" at 22700 South Alameda Street are located within 0.5 mile northeast and southwest, respectively, of the Site. These facilities are crossgradient of the Site. Based on their distances and directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

CERCLIS-NFRAP – As of February 1995, CERCLIS facilities designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP facilities may be properties where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the facility to be placed on the NPL, or the contamination was not serious enough to require federal Superfund action or NPL consideration. One off-Site facility, "Johns-Manville Sales Corp Del" at 2430 East 223rd Street, is located within 0.5 mile west of the Site. This facility is crossgradient of the Site. Based on its distance and direction from the Site,

in Kleinfelder's opinion this facility is unlikely to have resulted in a REC currently affecting the Site. Three other CERCLIS-NFRAP facilities are listed in the EDR report but are not within 0.5 mile of the Site. The ASTM Standard search distance required for consideration for CERCLIS-NFRAP facilities is 0.5 mile; therefore, these listed facilities did not require further evaluation.

CORRACTS – The RCRA Corrective Actions Report (CORRACTS) identifies hazardous waste handlers with RCRA corrective action activity. Five off-Site facilities are listed in the CORRACTS Database. "Raytheon Systems Co" at 1500 Cabot Way is located within 0.5 mile northeast of the Site. "Niklor Chemical Co Inc" at 2060 East 220th Street (northwest of the Site), "Stauffer Chem Co" at 2112 East 223rd Street (west of the Site), "Monsanto Chem Co" at 2100 East 223rd Street (west of the Site), and "Texaco US Div Texaco Inc" at 23208 (street name not listed; southwest of the Site) are located within 1 mile of the Site. These facilities are crossgradient of the Site. Based on their distances and directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

RCRA-TSDF – The Resource Conservation and Recovery Information System (RCRIS) includes selective information on facilities which transport, store, treat, and/or dispose of hazardous waste (referred to as TSD facilities) as defined by the Resource Conservation and Recovery Act (RCRA). Four off-Site facilities are listed in the RCRA-TSDF Database. "Raytheon Systems Co" at 1500 Cabot Way is located within 0.5 mile northeast of the Site. This facility is crossgradient of the Site. Based on its distance and direction from the Site, in Kleinfelder's opinion this facility is unlikely to have resulted in a REC currently affecting the Site. Three other RCRA-TSDF facilities are also listed in the EDR report but are not within 0.5 mile of the Site. The ASTM Standard search distance required for consideration for RCRA-TSDF facilities is 0.5 mile; therefore, these listed facilities did not require further evaluation.

RCRA-LQG – These listings indicate that hazardous wastes are generated on a facility's premises as part of the company's business practices. One large quantity generator (LQG) located within 1 mile of the Site was listed in the EDR report, but does not adjoin the Site. The ASTM Standard search distance required for consideration for LQGs is Site and adjoining; therefore, this listed facility did not require further evaluation.

RCRA-SQG – These listings indicate that hazardous wastes are generated on a facility's premises as part of the company's business practices. Two small quantity generators (SQGs) located within 0.5 mile of the Site and two additional SQGs located within 1 mile of the Site were listed in the EDR report. None of these facilities adjoin the Site. The ASTM Standard search distance required for consideration for SQGs is Site and adjoining; therefore, these listed facilities did not require further evaluation.

RCRA-NonGen – These listings indicate that hazardous wastes were formerly, but not presently, generated on a facility's premises as part of the company's business practices. One non-generator located within 1 mile of the Site was listed in the EDR report, but does not adjoin the Site. The ASTM Standard search distance required for consideration for NonGens is Site and adjoining; therefore, this listed facility did not require further evaluation.

TRIS – The Toxic Chemical Release Inventory System (TRIS) identifies facilities that release toxic chemicals to the air, water, and land, in reportable quantities under Superfund Amendments and Reauthorization Act (SARA) Title III, Section 313. One TRIS facility located within 1 mile of the Site was listed in the EDR report, but does not adjoin the Site. The ASTM Standard search distance required for consideration for TRIS facilities is Site only; therefore, this listed facility did not require further evaluation.

FINDS – The Facility Index System/Facility Identification Initiative Program Summary Report (FINDS) contains both facility information and pointers to other sources that contain more detail. Two FINDS facilities located within 0.5 mile of the Site were listed in the EDR report. Five additional FINDS facilities located within 1 mile of the Site were listed in the EDR report. None of these facilities adjoin the Site. The ASTM Standard search distance required for consideration for FINDS facilities is Site only; therefore, these facilities did not require further evaluation.

4.2.2 State and Local Agency, Tribal, and EDR Proprietary Records Review

The results of the state and local agency, tribal, and EDR proprietary records review are summarized below in Table 4-2 and the text that follows.

TABLE 4-2
STATE AND LOCAL AGENCY, TRIBAL, AND EDR PROPRIETARY RECORDS REVIEWED

Database Searched	Site Listing	Adjoining Listings	Other Listings within 0.25-Mile	Listings within 0.25-0.50-Mile	Listings within 0.5-1.0 Mile
HIST CAL-SITES	No	No	No	1	2
BEP	No	No	No	1	No
SCH	No	No	No	1	No
TOXIC PITS	No	No	No	No	1
SWF/LF	No	No	No	3	No
CA WDS	No	No	No	2	No
WMUDS/SWIS	No	No	No	6	No
CORTESE	No	No	No	8	No
SWRCY	No	No	No	2	No
LUST	No	No	No	10	No
CA FID UST	No	No	2	3	1
CA SLIC	No	No	No	7	No
AOCONCERN	No	No	No	No	No
UST	No	No	2	2	No
HIST UST	No	No	2	2	1
AST	No	No	No	No	No
LIENS	No	No	No	No	No
SWEEPS UST	No	No	2	4	1
CHMIRS	No	No	No	3	1
NOTIFY 65	No	No	No	No	1
LA Co. Site Mitigation	No	No	No	No	No
DEED	No	No	No	1	1
VCP	No	No	No	No	1
DRYCLEANERS	No	No	No	No	No
WIP	No	No	No	No	No
LOS ANGELES Co. HMS	No	No	No	3	1
CDL	No	No	No	No	No
RESPONSE	No	No	No	1	2
HAZNET	No	No	1	2	3
AIRS	No	No	No	1	2
HAULERS	No	No	No	No	No
ENVIROSTOR	No	No	No	2	7
INDIAN RESERV	No	No	No	No	No

TABLE 4-2 (continued)
STATE AND LOCAL AGENCY, TRIBAL, AND EDR PROPRIETARY RECORDS REVIEWED

Database Searched	Site Listing	Adjoining Listings	Other Listings within 0.25-Mile	Listings within 0.25-0.50-Mile	Listings within 0.5-1.0 Mile
INDIAN ODI	No	No	No	No	No
INDIAN LUST	No	No	No	No	No
INDIAN UST	No	No	No	No	No
Manufactured Gas Plants	No	No	No	No	No

The Site was not listed in the searched state and local agency, tribal, and EDR proprietary records databases. Listed off-Site facilities are discussed below.

HIST CAL-SITES – The California Environmental Protection Agency (Cal/EPA) maintained a database of potential or confirmed hazardous waste facilities identified as the HIST Cal-Sites list. The facilities were identified through the historical Abandoned Site Survey Program and federal, state, and county funded site evaluation programs. Three off-Site facilities are listed in the HIST Cal-Sites Database. "Manville Corporation" at 2420 East 223rd Street is located within 0.5 mile west of the Site. "Stauffer Chem Co" at 2112 East 223rd Street and "Monsanto Chemical Company/ C/O" at 2100 East 223rd Street are located within 1 mile west of the Site. These facilities are crossgradient of the Site. Based on their distances and directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

BEP – The Bond Expenditure Plan (BEP) was a site-specific expenditure plan developed by the California Department of Health Services as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. One off-Site BEP facility, "Manville Corporation" at 2420 East 223rd Street, is located within 0.5 mile west of the Site. This facility is crossgradient of the Site. Based on its distance and direction from the Site, in Kleinfelder's opinion this facility is unlikely to have resulted in a REC currently affecting the Site.

SCH – The SCH List contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. One SCH facility located within 0.5 mile of the Site was listed in the EDR report. The ASTM Standard

search distance required for consideration for SCH facilities is Site and adjoining, and this facility does not adjoin the Site; therefore, this listed facility did not require further evaluation.

TOXIC PITS – This database is a list of Toxic Pits cleanup facilities, and identifies facilities suspected of containing hazardous wastes where cleanup has not yet been completed. The data come from the State Water Resources Control Board (SWRCB). One off-Site Toxic Pits facility, "GATX, Carson Terminal" at 2000 East Sepulveda Boulevard, is located within 1 mile southwest of the Site. This facility is crossgradient of the Site. Based on its distance and direction from the Site, in Kleinfelder's opinion this facility is unlikely to have resulted in a REC currently affecting the Site.

SWF/LF – The California Integrated Waste Management Board (CIWMB) maintains the Solid Waste Information System (SWIS) Database of information regarding active, inactive, and closed landfills, and transfer and composting stations. The database is published annually. SWIS is also known as Solid Waste Fills/Land Fills (SWF/LF). Three off-Site facilities are listed in the SWF/LF Database. "Caltrans Long Beach, W LA River #2" at "W Los Angeles River/At end of W. Carson" (east of the Site), "Hardwick's Disposal Pit" at 22620 South Alameda Street (southwest of the Site), and "Alameda Street Landfill" at 22700 South Alameda Street (southwest of Site) are located within 0.5 mile of the Site. These facilities are crossgradient of the Site. Based on their distances and directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

CA WDS – The California Waste Discharge System (CA WDS) List is a SWRCB listing of facilities that have been issued waste discharge requirements. Two CA WDS facilities located within 0.5 mile of the Site were listed in the EDR report. These facilities do not adjoin the Site. The ASTM Standard search distance required for consideration for CA WDS facilities is Site only; therefore, these listed facilities did not require further evaluation.

WMUDS/SWAT – The Waste Management Unit Database (WMUDS) is used by the state for program tracking and inventory of waste management units. Six off-Site facilities are listed in the WMUDS/SWAT Database. "Manville Plant Site" at 2400 East 223rd Street (west of the Site), "Johns-Manville-Carson" at 22401 South Alameda Street (west of the Site), "Watson Land Company No. 1" at 22400 South Alameda

Street (west of the Site), "Hardwick Disposal Pit No. 44" at 22620 South Alameda Street (southwest of the Site), "Cassidy & Crisman-Carson" at 22700 South Alameda Street (southwest of the Site), and "Alameda Street" at 22700 South Alameda Street (southwest of the Site) are located within 0.5 mile of the Site. These facilities are crossgradient of the Site. Based on their distances and directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

CORTESE – This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with underground storage tanks (USTs) having a reportable release, and solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency (Cal/EPA) Office of Emergency Information. Eight facilities are listed within the ASTM Standard search distance. "Cardlock Fuel Systems S.S.#18" at 2720 East Carson Street (northeast of the Site), "Dominguez Water company" at 21718 South Alameda Street (north-northwest of the Site), "Shell #204-4482-6307" at 1700 West Wardlow Road (east of the Site), "Manville Plant" at 2420 East 223rd Street (west of the Site), "Commercial Carriers Inc" at 22220 South Alameda Street (west of the Site), "Matlack Inc" at 22422 South Alameda Street (west of the Site), "United Oil #05" at 3631 Santa Fe Avenue (east of the Site), and "State Salvage" at 22500 South Alameda Street (southwest of the Site) are located within 0.5 mile of the Site. Although the listings provide no further information, these facilities are also listed in the Leaking UST (LUST) Database, discussed below, and LUST facilities are typically also listed in the CORTESE Database. Based on their distances and/or direction from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

SWRCY – The SWRCY Database is a listing of solid waste recycling facilities in California. Two off-Site facilities are listed in the SWCRY Database. "State Salvage Inc." at 22500 South Alameda Street and "Carson Auto Inc" at 22606 South Alameda Street are located within 0.5 mile west and southwest, respectively, of the Site. These facilities are crossgradient of the Site. Based on their distances and directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

LUST – The LUST Database is the State of California's list of LUST locations. The State Water Resources Control Board and individual Regional Water Quality Control Boards maintain LUST lists. Ten off-Site facilities are listed in the LUST Database. "Cardlock Fuel Systems S.S.#18" at 2720 East Carson Street is located within 0.5 mile northeast (crossgradient) of the Site. This facility had a release of gasoline in approximately 1994, which affected groundwater. A remediation plan has been submitted for this facility. "Dominguez Water Company" at 21718 South Alameda Street is located approximately 0.5 mile north-northwest (upgradient) of the Site. This facility had a release which reportedly impacted soil only. The case was closed on September 28, 2007. "Calif Dept of Transportation" at 22101 is located within 0.5 mile northeast (crossgradient) of the Site. A release of gasoline was reported in approximately 1995, but the listing indicates little additional information. "Shell #204-4482-6307" at 22101 South Santa Fe Avenue is located within 0.5 mile east (crossgradient) of the Site. This facility had a release of gasoline which impacted groundwater. The case was closed on September 6, 1996. "Ventura Transfer Company" at 2418 East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. This facility had a release of diesel. The leak is being confirmed. "Manville Plant" at 2420 East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. This facility had a release of diesel which impacted groundwater. The case was closed on July 18, 1996. "Matlack Inc" at 22422 South Alameda Boulevard is located within 0.5 mile west (crossgradient) of the Site. This facility had a release of diesel which impacted groundwater. The case was closed on June 26, 1996. "Commercial Carriers Inc" at 22440 South Alameda Street is located within 0.5 mile west (crossgradient) of the Site. This facility had a release of diesel which impacted soil. The case was closed on May 30, 1989. "United Oil #05" at 3631 Santa Fe Avenue is located within 0.5 mile east (crossgradient) of the Site. This facility had a release of gasoline which impacted groundwater. The listing indicates pollution characterization is underway. "State Salvage" at 22500 South Alameda Street is located within 0.5 mile west (crossgradient) of the Site. This facility had a release of diesel which impacted soil. The case was closed on July 3, 1991. Based on their distances and/or directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

California Facility Inventory (CA FID) UST – This database contains active and inactive UST locations. The source is the SWRCB. Six off-Site facilities are listed in the CA FID Database, including two facilities listed within 0.25 mile of the Site. The

ASTM Standard search distance required for consideration for CA FID USTs is Site and adjoining, and the facilities do not adjoin the Site; therefore, these listed facilities did not require further evaluation.

California Spills, Leaks, Investigations, and Cleanups (CA SLIC) – The CA SLIC List, maintained by the Los Angeles Regional Water Quality Control Board (LARWQCB), includes contaminated sites that impact groundwater or have the potential to impact groundwater. Seven off-Site facilities are listed in the CA SLIC Database. "Lakewood Kohl's" at 2650 East Carson Street is located within 0.5 mile northeast (crossgradient) of the Site. This facility had a release and the status is not reported. "Rockwell" at 2770 East Carson Street is located within 0.5 mile northeast (crossgradient) of the Site. This facility had a release of perchloroethylene (PCE), trichloroethylene (TCE), and volatile organic compounds (VOCs). The status is reported as case open. Business name "Not reported" at 2442 East Carson Street is located within 0.5 mile north-northwest (upgradient) of the Site. This facility had a release and pollution characterization is ongoing. "Acta South – Parcel SE-340, Within the Union Pacif" at 2442 East Carson Street is located within 0.5 mile north-northwest (upgradient) of the Site. This facility had a release and the case is closed. Business name "Not reported" at South Alameda Street/East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. This facility had a release and the case is closed. Business name "Not reported" at 2384 East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. This facility had a release and pollution characterization is ongoing. "City of Carson – ARCO" at 2384 East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. This facility had a release and site assessment is ongoing. Based on their distances and/or directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

UST – The California UST Database is a listing of registered USTs within California maintained by the SWRCB. Two UST facilities within 0.25 mile of the Site and two facilities within 0.5 mile of the Site were listed in the EDR report, but none of these facilities adjoin the Site. The ASTM Standard search distance required for consideration for USTs is Site and adjoining; therefore, these listed facilities did not require further evaluation.

Historical (HIST) UST – This database, maintained by the California State Water Resources Control Board, identifies historical registered USTs. Two HIST UST facilities within 0.25 mile of the Site and three facilities within 0.5 mile of the Site were listed in the EDR report, but none adjoin the Site. The ASTM Standard search distance required for consideration for HIST USTs is Site and adjoining; therefore, these listed facilities did not require further evaluation.

Statewide Environmental Evaluation and Planning System (SWEEPS) UST – This database was a UST listing maintained and updated by a company under contract to the State Water Resources Control Board in the early 1980s, but it is no longer maintained or updated. Two SWEEPS UST facilities within 0.25 mile of the Site and five facilities within 0.5 mile of the Site were listed in the EDR report, but none adjoin the Site. The ASTM Standard search distance required for consideration for SWEEPS USTs is Site and adjoining; therefore, these listed facilities did not require further evaluation.

CHMIRS – The California Hazardous Material Incident Report System (CHMIRS) contains information on reported hazardous material incidents (i.e., accidental releases or spills). The source is the California Office of Emergency Services. Four off-Site listings are in the CHMIRS Database. The ASTM Standard search distance required for consideration for CHMIRS listings is Site only; therefore, these listings did not require further evaluation.

NOTIFY 65 – Notify 65 records contain facility notifications about releases that could impact drinking water and thereby expose the public to a potential health risk. The data are from the SWRCB's Proposition 65 database. One off-Site facility, "Texaco" at 232000 South Alameda Street, is located within 1 mile southwest (crossgradient) of the Site. Based on the distance and direction from the Site, in Kleinfelder's opinion this facility is unlikely to have resulted in a REC currently affecting the Site.

DEED – This database contains information regarding facilities with land use restrictions. The source for this list is the Department of Toxic Substances Control (DTSC). Two off-Site DEED facilities are listed, but the ASTM Standard search distance required for consideration for DEED facilities is Site only, and the Site is not listed as a DEED facility.

VCP – The Voluntary Cleanup Program (VCP) database contains low threat level properties with either confirmed or unconfirmed releases, where project proponents have requested that DTSC oversee investigation and/or cleanup activities and have agreed to pay DTSC's related oversight costs. One off-Site facility is located within 1 mile of the Site but over 0.5 mile from the Site. The ASTM Standard search distance required for consideration for VCP facilities is 0.5 mile; therefore, this listed facility did not require further evaluation.

LOS ANGELES COUNTY HMS – The Los Angeles County Hazardous Materials System (HMS) List is a street address listing of permitted industrial facilities, and facilities with permitted USTs. Four off-Site facilities are located within 0.5 mile of the Site. The ASTM Standard search distance required for consideration for HMS facilities is Site and adjoining, and the Site was not listed; these listed facilities did not require further evaluation.

RESPONSE – The Response Database identifies confirmed release sites where the DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high priority and high potential risk. "Manville Corporation" at 2420 East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. The media impacted is soil and use restrictions have been placed on this facility. The status listed is "Certified / Operation & Maintenance." "Stauffer Chem Co" at 2112 East 223rd Street is located within 1 mile west (crossgradient) of the Site. The media impacted is soil and groundwater. The status is listed as active. "Monsato Chermical Company C/O Larry Adams Superin" at 2100 East 223rd Street is located within 1 mile west (crossgradient) of the Site. The media impacted is soil and groundwater. The status is listed as active. Based on their distances and directions from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC currently affecting the Site.

HAZNET – The HAZNET Database is extracted from the copies of hazardous waste manifests received each year by DTSC. Six off-Site facilities are listed in the HAZNET Database. The ASTM Standard search distance required for consideration for HAZNET facilities is Site only, and the Site was not listed; these listed facilities did not require further evaluation.

AIRS – This database contains toxics and criteria pollutant emissions data. The source of this list is the Air Resources Board (ARB) and local air pollution agencies. Three off-Site facilities are listed in the AIRS Database. The ASTM Standard search distance required for consideration for AIRS facilities is Site only, and the Site was not listed in the AIRS Database.

ENVIROSTOR – The DTSC's Site Mitigation and Brownfields Reuse Program (SMBRP) maintains the ENVIROSTOR Database, which identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes Federal Superfund (NPL), State Response (including Military Facilities and State Superfund), Voluntary Cleanup, and School sites. ENVIROSTOR provides similar information to that formerly maintained in the Cal-Sites Database, and provides additional information including identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites. Nine off-Site facilities are listed within 1 mile of the Site. "Dura-Life Compressed Fiberglass Pots Inc" at 21100 South Alameda Street is located within 1 mile north (upgradient) of the Site. Wood furniture manufacturing and repacking of soaps and degreasers was previously performed at this facility. DTSC required no further action and the case has been referred to another agency. "South Region High School #4 56" at West Carson Street/Santa Fe Avenue is located within 0.5 mile northeast (crossgradient) of the Site. This facility was previously occupied by an office building, a railroad right-of-way, and for recreation services. No further action is required. "Clean Steel Inc." at 2061 East 220th Street is located within 1 mile northwest (crossgradient) of the Site. The previous use of this facility was not specified. The status is listed as "Refer: 1248 Local Agency." "Niklor Chem Co Inc" at 2060 East 220th Street is located within 1 mile northwest (crossgradient) of the Site. The previous use of this facility was not specified. The status is listed as "Refer: 1248 Local Agency." "Manville Corporation" at 2420 East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. The media impacted is soil and use restrictions have been placed on this facility. The previous use of this facility is listed as unknown. The status listed is "Certified / Operation & Maintenance." "Stauffer Chem Co" at 2112 East 223rd Street is located within 1 mile west (crossgradient) of the Site. The previous use of this facility was chemical manufacturing. The media impacted is soil and groundwater. The status is

listed as active. "Coons Trust Property" at 2254 East 223rd Street is located within 0.5 mile west (crossgradient) of the Site. The previous use of this facility is listed as chemical manufacturing. The media impacted is soil and groundwater. Restrictions have been placed on this facility. The status listed is "Certified / Operation & Maintenance." "Monsato Chemical Company C/O Larry Adams Superin" at 2100 East 223rd Street is located within 1 mile west (crossgradient) of the Site. The previous use of this facility is listed as chemical manufacturing. The media impacted is soil and groundwater. The status is listed as active. "Watson Carbon & Chemical Company" at 2021 East Sepulveda Boulevard is located within 1 mile southwest (crossgradient) of the Site. The media impacted is not specified. The status listed is "Refer: Other Agency." Based on the distances and/or direction of these facilities from the Site, in Kleinfelder's opinion these facilities are unlikely to have resulted in a REC affecting the Site.

4.2.1 Orphan List

Sites not plotted by EDR due to poor or inadequate address information are referred to as orphan sites. There are 147 unmapped sites in the EDR report. The orphan summary/unmapped sites report was reviewed by Kleinfelder to assess the potential for off-Site properties that might pose a REC to the Site. Based on our review of these listings and our reconnaissance of the Site vicinity on April 24, 2008, these orphan sites appear to be in other databases discussed previously, are outside of the ASTM search distances, and/or are located hydrogeologically down- or crossgradient relative to the Site, and in our opinion they do not represent a REC to the Site.

4.3 OTHER RECORDS REVIEWED / AGENCIES CONTACTED

The following additional sources of environmental records were reviewed during this Phase I ESA for the purposes of meeting the ASTM Standard. Local regulatory agencies were contacted for reasonably ascertainable and practically reviewable documentation regarding RECs present at the Site and adjoining facilities. Interviews with local regulatory agency representatives are included in Section 7 of this report (with interview documentation included in Appendix C). The following agencies were contacted for documentation:

- ☐ South Coast Air Quality Management District (SCAQMD)

☐..... Long Beach Development Services (LBDS)
☒..... Long Beach Health and Human Services (LBHHS)
☒..... Long Beach Fire Department (LBFD)
☒..... Los Angeles Regional Water Quality Control Board (LARWQCB)
☐..... State Division of Oil, Gas, and Geothermal Resources (DOGGR)
☒..... State Department of Toxic Substances Control (DTSC)
☒..... California State Fire Marshal (CSFM) Pipeline Safety Office
☒..... Los Angeles Sanitation District (LASD)

SCAQMD was not contacted because information concerning air permits was obtained from its internet web site (www.aqmd.gov). LBDS was not contacted because information concerning building permits was obtained from its internet web site (www.longbeach.gov). DOGGR was not contacted because information concerning oil and gas fields was obtained from published maps available for download on its internet web site (www.consrv.ca.gov).

South Coast Air Quality Management District

On May 5, 2008, Kleinfelder reviewed the SCAQMD web site (www.aqmd.gov) to search for information regarding permits, equipment lists, and notices of violation (NOV) for the Site addresses. According to the SCAQMD Facility Information Module, no records were available for the Site.

Long Beach Development Services

On April 25, 2008, Kleinfelder reviewed the LBDS web site (www.longbeach.gov) for available historical permit information pertaining to the Site. An Application for Building Permit issued on October 18, 1946 with attached site plan was reviewed. The permit was to construct a 560 square foot dwelling at 3628 Webster Avenue, and it appears the proposed dwelling was located off-Site, near the intersection of Webster Avenue and West Lincoln Street.

Long Beach Health and Human Services

On April 25, 2008, Kleinfelder submitted a request to LBHHS to review available records pertaining to the Site. A letter dated May 6, 2008 from LBHHS indicated that there was no information on file for the Site.

Long Beach Fire Department

On April 25, 2008, Kleinfelder submitted a written request to LBFD for information pertaining to the Site. Kleinfelder was informed via a facsimile dated April 29, 2008 that LBFD found no files for the Site.

Los Angeles Regional Water Quality Control Board

On April 25, 2008, Kleinfelder searched for information pertaining to the Site on the SWRCB's Geotracker Database (www.geotracker.swrcb.ca.gov), which lists LUST cases. The search identified no records pertaining to the Site. In addition, Kleinfelder submitted a written request to LARWQCB for a review of available records. According to the UST Division, no records are available for the Site. A response has not been received to date from the SLIC Division. Should records exist for the Site and information subsequently received alter our conclusions and recommendations, an addendum to this Phase I ESA will be provided.

Department of Oil, Gas, and Geothermal Resources

On April 23, 2008, DOGGR Map W1-6 was reviewed by Kleinfelder to identify oil and/or gas wells located on or in close proximity to the Site. According to DOGGR Map W1-6, no oil or gas wells are depicted on or immediately adjoining the Site.

State Department of Toxic Substances Control

On May 6, 2008, Kleinfelder submitted a request to DTSC for information pertaining to the Site. A letter dated May 9, 2008 from DTSC indicated that no records exist pertaining to the Site.

State Fire Marshal, Pipeline Safety Office

On April 23, 2008, Kleinfelder submitted a request to the CSFM for pipeline information in the vicinity of the Site. According to a letter received from the CSFM via electronic mail, the following pipelines jurisdictional to the CSFM are present in the Site vicinity:

ConocoPhillips
CSFM ID: 0447
Size: 6, 8, 10
Commodity: Crude Oil
Contact: Leo Martinez, (805) 226-2656

Defense Energy Support Ctr
CDFM ID: 0065
Size: 10
Commodity: Refined Product (Gasoline, Jet Fuel, Gas Oil)
Contact: Joe Trani, (310) 900-6960 x1106

Kinder Morgan
CDFM ID: 0268
Size: 10
Commodity: Refined Product (Gasoline, Jet Fuel, Gas Oil)
Contact: Don Quinn, (714) 560-4940

Kinder Morgan
CDFM ID: 0267
Size: 16
Commodity: Refined Product (Gasoline, Jet Fuel, Gas Oil)
Contact: Don Quinn, (714) 560-4940

Kinder Morgan
CDFM ID: 0258
Size: 4, 10
Commodity: Refined Product (Gasoline, Jet Fuel, Gas Oil)
Contact: Don Quinn, (714) 560-4940

Pacific Pipeline System, LLC
CSFM ID: 0800
Size: 16
Commodity: Crude Oil
Contact: Mel Durley, (562) 728-2859

Pacific Pipeline System, LLC
CSFM ID: 0987
Size: 20
Commodity: Crude Oil
Contact: Mel Durley, (562) 728-2859

Paramount
CSFM ID: 0217
Size: 6, 8
Commodity: Crude Oil
Contact: Jack Harding, (562) 531-2060 x2667

On April 25, 2008, Kleinfelder requested information on specific pipeline locations and recorded releases from the above-referenced contacts. Responses have not been received to date. Should information subsequently received alter our conclusions and recommendations, an addendum to this Phase I ESA will be provided.

Los Angeles Sanitation District

On April 25, 2008, Kleinfelder submitted a written request to LASD for industrial waste information for the Site. A response has not been received to date. Should records exist for the Site and information subsequently received alter our conclusions and recommendations, an addendum to this Phase I ESA will be provided.

4.4 PHYSICAL SETTING SOURCE(S)

Table 4-3 presents information concerning the physical setting of the Site. This information was obtained from published maps.

TABLE 4-3
PHYSICAL SETTING

Data	General Information
USGS TOPOGRAPHIC QUADRANGLE	Based on a review of the United States Geological Survey (USGS) Long Beach, California 7½-Minute Series (Topographic) Quadrangle Map dated 1934, photorevised 1981, the Site is located at an approximate elevation of 20 to 25 feet above mean sea level (msl). The topographic relief in the Site vicinity slopes gently to the west.
SOIL TYPE	The dominant soil component in the general area of the Site is classified as "Urban Land" (NCSS, as per EDR, 2008). Other surface soil textures in the Site vicinity include loam, clay, silt loam, loamy sand, fine sand, clay loam, gravelly-sandy loam, coarse sand, gravelly-sand, and sand.
OIL AND GAS FIELDS	DOGGR Map W1-6 was reviewed by Kleinfelder to identify oil and/or gas wells located on or in close proximity to the Site. According to DOGGR Map W1-6, oil or gas wells are not depicted on or immediately adjoining the Site.

Information about the regional geology is presented in Table 4-4. This information was obtained from published data and maps, interviews with public agencies, and/or from previous investigations conducted by Kleinfelder in the vicinity of the Site.

TABLE 4-4
REGIONAL GEOLOGY AND HYDROGEOLOGY

Physical Parameter	Information/Comments
REGIONAL PHYSIOGRAPHY AND GEOLOGY	The Site is located on the Central Plain of the southwestern Block of the Los Angeles Basin. The Los Angeles Basin lies within the Peninsular Ranges geomorphic province, and the Site is located within the Dominguez Gap physiographic feature. Regionally, the Site and surrounding area have been mapped as underlain by Holocene age surficial sediments, described as alluvial flood plain deposits of Dominguez Creek and the Los Angeles River (CDMG, 1962). Deeper alluvial sediments comprise the Upper Pleistocene Lakewood Formation (CDMG, 1961). The alluvial materials consist of clay, silt, silty sand, and sand. Below these alluvial sediments are non-marine and marine sediments including loosely consolidated gravels, sands, and silts of the Lower Pleistocene San Pedro Formation and underlying sedimentary formations/units that are reportedly up to 14,000 feet thick in this portion of the greater Los Angeles Basin area (CDMG, 1961).

TABLE 4-4 (continued)
REGIONAL GEOLOGY AND HYDROGEOLOGY

Physical Parameter	Information/Comments
REGIONAL HYDROGEOLOGY	The site is situated within the West Coast groundwater basin, wherein groundwater occurs in a series of Quaternary age units of varying usage and water quality. Shallow groundwater, which is not known to be used as a source of drinking water is encountered under unconfined conditions in the site vicinity in the Bellflower Aquiclude. From youngest to oldest, the aquifers in the Site vicinity beneath the Bellflower Aquiclude include the Gaspur Aquifer, the Gage Aquifer (also known as the "200 Foot Sand"), the Lynwood Aquifer (or "400 Foot Gravel"), and the Silverado Aquifer. Of these aquifers, most groundwater in the West Coast Basin is pumped from the Lynwood and Silverado Aquifers.
DEPTH TO GROUNDWATER	The depth to historic high groundwater at the Site is reported to be approximately 20 feet bgs (CDMG, 2001). Fluctuations of the groundwater level, localized zones of perched water, and soil moisture content should be anticipated during and following the rainy season. Irrigation of landscaped areas on or immediately adjacent to the site can also cause a fluctuation of local groundwater levels.
DIRECTION OF ANTICIPATED FLOW [1]	Shallow groundwater flow in the vicinity of the northwest corner of Santa Fe Avenue and Lincoln Street, located approximately 0.4 mile east of the Site, is to the southeast (Frey Environmental, Inc., 2007).
REGIONAL GROUNDWATER QUALITY PROBLEMS	Regional groundwater quality problems and regional impairments to water quality were not identified during Kleinfelder's assessment. (EDR, 2008).
FLOOD ZONE DESIGNATION	The Site is located within a flood hazard zone designated "AR" (FEMA, 1998).

[1] Groundwater flow direction is based on regional information sources. Site-specific conditions may vary due to a variety of factors including geologic anomalies, utilities, nearby pumping wells (if present), and other developments.

4.5 USER PROVIDED INFORMATION

According to the Client, the purpose for performing this Phase I ESA is to evaluate the potential for RECs at the Site prior to the Client proceeding with construction of a storm drain. Information regarding the current Site owner/occupant is listed in Table 4-5.

TABLE 4-5
OWNER / OCCUPANT INFORMATION

Entity	Name
OWNER	River Avenue and McHelen Avenue: City of Long Beach APN 7317-015-800: Edison Securities Company, a corporation
PROPERTY MANAGER	River Avenue and McHelen Avenue: N/A APN 7317-015-800: Roslyn Delmar
OCCUPANT	River Avenue and McHelen Avenue: N/A APN 7317-015-800: Orange County Nursery, Inc.

Note: N/A indicates not applicable

Summaries of interviews of key individuals with knowledge of the Site ("Key Site Managers") are provided in Section 7. The following sections present information provided by the Client.

4.5.1 Title Records

A Preliminary Title Report or Chain-of-Title Report was not provided to Kleinfelder for review prior to production of this report. Such documents may provide information about land including ownership and other interests in the land, easements, and liens. Not all liens, defects, and encumbrances affecting title to the land may be included in a Preliminary Title Report.

4.5.2 Environmental Liens and Usage Limitations

According to information provided in the EDR regulatory agency database search report (EDR, 2008), there are no liens listed in the US EPA's Federal Superfund Liens List, and no known recorded land-use environmental deed restrictions pertaining to the Site listed in the State Liens Database. According to the Client, there are no known current limitations on either activity at or use of the Site.

Kleinfelder requested EDR to perform an Environmental Lien Search for the Site. Results of the lien search indicated that no environmental lien or other Activity and Use Limitations (AULs) were found.

4.5.3 Value Reduction

As part of the ASTM E 1527-05 process, information is to be gathered regarding the prospective purchase price of the Site relative to its fair market value. If there appears to be a value reduction, that reduction must be identified with respect to whether the difference could be attributed to environmental degradation of the property. However, since this Phase I ESA was not performed in association with a property transaction, information from the client regarding value reduction is not applicable.

4.5.4 Other Information/Documents Provided

The Client reportedly does not have specialized knowledge of the Site.

5.0 HISTORY OF THE SITE

The history of the Site was researched to identify obvious uses. Historical land use was researched to the first developed use, or back to 1940, whichever was earlier or readily available. Table 5-1 summarizes the availability of information reviewed during this assessment.

TABLE 5-1
HISTORICAL SOURCES

Source	Years reviewed	Availability
SANBORN FIRE INSURANCE MAPS	N/A	EDR
AERIAL PHOTOGRAPHS	1928, 1947, 1956, 1956, 1965, 1976, 1989, 1994, 2002, and 2005	EDR
CITY DIRECTORIES	1920 through 2006 (selected years only)	EDR
HISTORICAL TOPOGRAPHIC MAP REPORT	1901, 1902, 1930, 1947, 1951, 1964, 1972, and 1981	EDR
BUILDING DEPARTMENT	1946	Long Beach Development Services
PREVIOUS ASSESSMENT(S)	N/A	N/A

Note: N/A indicates not available or not applicable

5.1 SANBORN FIRE INSURANCE MAPS

Sanborn Fire Insurance Maps provide historical land use information for some metropolitan areas and small, established towns. Kleinfelder requested that EDR search for available Sanborn Fire Insurance Maps. EDR indicated Sanborn Fire Insurance Maps were not available for the Site and immediate vicinity.

5.2 AERIAL PHOTOGRAPHS

A review of historical aerial photography may indicate past activities at a site that may not be documented by other means, or observed during a site visit. The effectiveness of this technique depends on the scale and quality of the photographs and the available coverage. Aerial photographs were obtained from several historical photograph collections through EDR. A tabulation of the aerial photographs reviewed

is presented in Table 5-2. Copies of the aerial photographs provided by EDR are included in Appendix D.

TABLE 5-2
HISTORICAL AERIAL PHOTOGRAPHS REVIEWED

Date	Approximate Scale	Type	Source	Quality
1928	1" = 500'	Black and White Monoscopic	Fairchild	Good
1947	1" = 666'	Black and White Monoscopic	Fairchild	Good
1956	1" = 400'	Black and White Monoscopic	Fairchild	Good
1965	1" = 666'	Black and White Monoscopic	Fairchild	Good
1976	1" = 666'	Black and White Monoscopic	Teledyne	Good
1989	1" = 666'	Black and White Monoscopic	USGS	Good
1994	1" = 666'	Black and White Monoscopic	USGS	Good
2002	1" = 666'	Black and White Monoscopic	USGS	Good
2005	1" = 484"	Color Monoscopic	EDR	Good

Note: Aerial photographs only provide information on indications of land use, and no conclusions regarding the release of hazardous substances or petroleum products can be drawn from the review of photographs alone.

5.1.1 Site

1928 – River Avenue appeared to be paved from West Wardlow Road to its southern terminus. North of the intersection of River Avenue and West Wardlow Road appeared to be vacant land. The area south of the southern terminus of River Avenue where the detention basin is to be constructed also appeared to be vacant land.

1947 – River Avenue and McHelen Avenue appeared to be paved. The area south of the southern terminus of River Avenue where the detention basin is to be constructed appeared to remain vacant land.

1956 – There are no significant changes from the 1947 aerial photograph, with the exception of the presence of a dirt road which traversed the general area where the detention basin is to be constructed.

1965 – The Interstate 405 Freeway and its overpass at McHelen Avenue had apparently been constructed. River Avenue appeared similar to the 1956 aerial photograph. A dirt road continued to traverse the area where the detention basin is to be constructed.

1976 – There are no significant changes from the 1965 aerial photograph.

1989 – River Avenue and McHelen Avenue appeared generally as they exist today. The area where the detention basin is to be constructed appeared light in color, suggesting disturbed (e.g., recently graded) soil.

1994 – There are no significant changes from the 1989 aerial photograph.

2002 and 2005 – The Site appeared generally as it exists at the present time, with the southern portion of the Site within APN 7317-015-800 in use by the plant nursery.

5.1.2 Surrounding Areas

1928 – Areas immediately adjoining the Site appeared to be vacant land. What appeared to be agricultural land was present farther southeast.

1947 – Residential development was evident along River Avenue. Areas adjoining McHelen Avenue appeared to be vacant land. What appeared to be a natural waterway was evident to the south of the location where the detention basin is to be constructed. What appeared to be agricultural land was present farther southeast.

1956 – Increased residential development was evident along River Avenue. In addition, residential development was evident along McHelen Avenue. What appeared to be agricultural land was present to the east and southeast of the area where the detention basin is to be constructed.

1965 – The areas adjoining River Avenue and McHelen Avenue appeared similar to the 1956 aerial photograph, with the exception of the addition of the Interstate 405 Freeway. What appeared to be buildings were visible southeast and southwest of the area where the detention basin is to be constructed. Farther southwest was an oval-shaped surface feature which appeared to probably be a catch basin. An electrical substation was visible farther south of the Site.

1976 – The areas adjoining River Avenue and McHelen Avenue appeared similar to the 1965 aerial photograph. Areas adjoining the proposed detention basin to the east, south, and west appeared to be vacant land. The electrical substation remained farther south.

1989 – Areas adjoining River Avenue and McHelen Avenue appeared generally as they are at present. Areas adjoining the proposed detention basin to the east, south, and west appeared light in color, suggesting disturbed (e.g., recently graded) soil. Farther south the electrical substation remained.

1994 – There were no significant changes from the 1989 aerial photograph.

2002 and 2005 – The adjoining sites appeared as it does at present.

Based on the historical aerial photographs reviewed, no environmental conditions were observed on the immediate surrounding properties that suggest evidence of a REC for the Site.

5.3 CITY DIRECTORIES

City directories provide information regarding property occupants by address. EDR provided a summary city directory search report, which is included in Appendix D. The Site address of 3628 Webster Avenue was not listed in EDR's report.

Residences were listed at street addresses along West Arlington Street, Webster Avenue, McHelen Avenue, and River Avenue beginning in 1929 and continuing through 2006. In addition to the residential listings, the following commercial facilities of potential concern were listed:

- "Genes Crane Serv Excavating Contr GA" at 3661 River Avenue was listed in a 1963 and 1969 directory. This facility would have been located on the northwest corner of River Avenue and West Cameron Street, which is considered by the ASTM Standard to be adjoining to the Site.

- "Kermahs Mobil Service" at 2121 Arlington Street was listed in a 1971 directory. This facility would have been located on the north side of West Arlington Street, between River Avenue and Webster Avenue, and is not considered by the ASTM Standard to be adjoining to the Site.

The two above-referenced locations are not listed in EDR's regulatory database search report (previously discussed in Section 4). In Kleinfelder's opinion these potential concerns are unlikely to have resulted in RECs affecting the Site.

No other listings of environmental concern to the Site were identified in the city directories reported by EDR.

5.4 HISTORICAL TOPOGRAPHIC MAP REVIEW

Kleinfelder obtained information regarding historical topographic maps of the Site vicinity from EDR. The topographic maps reviewed for this assessment are listed below in Table 5-3. Copies of the maps are included in Appendix D.

TABLE 5-3
HISTORICAL TOPOGRAPHIC MAPS REVIEWED

Year	Quadrangle	Series	Scale
1901	Southern CA Sheet 1	60 minute	1:250,000
1902	Downey	15 minute	1:62,500
1930	Compton	6 minute	1:24,000
1947	Downey	15 minute	1:50,000
1951	Long Beach Vicinity 2 of 3	7.5 minute	1:24,000
1964	Long Beach	7.5 minute	1:24,000
1972 (photorevised from 1964)	Long Beach	7.5 minute	1:24,000
1981 (photorevised from 1964)	Long Beach	7.5 minute	1:24,000

5.4.1 Site

1901 and 1902 – The Site was depicted as undeveloped land, with no structures shown on the Site.

1930 – River Avenue, from West Wardlow Road to its southern terminus, was depicted. The area north of the intersection of River Avenue and West Wardlow Road was depicted as undeveloped land. The area south of the southern terminus of River Avenue was also depicted as undeveloped land.

1947 – There were no significant changes from the 1930 topographic map.

1951 – River Avenue and McHelen Avenue were depicted. The area south of the southern terminus of River Avenue remained depicted as undeveloped land.

1964 – River Avenue and McHelen Avenue remained depicted. A southwest-oriented roadway was depicted to the south of the southern terminus of River Avenue.

1972 and 1981 – There were no significant changes from the 1964 topographic map.

5.4.2 Surrounding Areas

1901 and 1902 – The Site vicinity was depicted as undeveloped land, with no structures in the immediate vicinity of the Site.

1930 – No structures were shown on the properties adjoining the Site.

1947 – Structures were evident along River Avenue. The area north of the intersection of River Avenue and West Wardlow Road was depicted as undeveloped land. The area south of the southern terminus of River Avenue was also depicted as undeveloped land.

1951 – Structures were evident along River Avenue. The area adjoining the west side of McHelen Avenue was depicted as a shaded region, indicating dense development. No structures were shown on the properties adjoining the east side of McHelen Avenue.

1964 – Adjoining areas along River Avenue and McHelen Avenue were depicted as a shaded region, indicating dense development. A church was depicted on the southwest corner of West Wardlow Road and River Avenue. Structures were shown south of the area where the detention basin is to be constructed.

1972 – There were no significant changes from the 1964 topographic map, other than structures no longer being shown south of the area where the detention basin is to be constructed.

1981 – There were no significant changes from the 1964 topographic map, except for the addition of the label "Substa" to an area south of the Site. This appears to be the electrical substation which presently is located to the south of the Site.

Based on the topographic maps reviewed, no environmental conditions were observed on the immediate surrounding properties that suggest evidence of a REC for the Site.

5.5 BUILDING DEPARTMENT RECORDS

According to LBDS records, an Application for Building Permit was issued on October 18, 1946 for construction a 560 square foot dwelling at 3628 Webster Avenue. Based on review of a site plan with the permit, it appears the proposed dwelling was located off-Site, near the intersection of Webster Avenue and West Lincoln Street.

5.6 PREVIOUS ASSESSMENTS

Reports of previous assessments pertaining to the Site were not provided to Kleinfelder for review, nor were the existence of previous assessments revealed during the historical research for the Site.

6.0 SITE RECONNAISSANCE

Kleinfelder's Phase I ESA activities included a Site reconnaissance. This section summarizes the findings from the Site reconnaissance.

6.1 METHODOLOGY AND LIMITING CONDITIONS

Mr. Paolo Dizon performed a Site reconnaissance on April 24, 2008. The Site reconnaissance included a visual inspection of the Site to assist in identifying the presence or likely presence of hazardous substances or petroleum hydrocarbons under conditions that indicate an existing release, a past release, or threat of release into structures, soil, groundwater, or surface water at the Site (i.e., RECs). Observations of readily apparent environmental conditions are summarized in Table 6-1, and color photographs of the Site are presented on Plates 3 through 7. The approximate Site boundaries are shown on Plate 2, "Site Map."

6.2 GENERAL SITE SETTING

The Site comprises an approximately 1,800-foot length of River Avenue and McHelen Avenue, which are contiguous asphalt-paved roadways, and adjoining to the south, beyond the terminus of River Avenue, also an approximately 100-foot by 250-foot area located within a parcel used as a plant nursery by Orange County Nursery, Inc. The Site is located in the City of Long Beach, California.

6.3 SITE OBSERVATIONS

Site observations are indicated in Table 6-1.

TABLE 6-1
SITE OBSERVATIONS

General Observations	Remarks	Observed	Not Observed
Current use	River Avenue and McHelen Avenue are active roadways paved with asphalt. The proposed detention basin is located within APN 7317-015-800, which is currently developed as a plant nursery.	X	
Current use likely to indicate RECs	Use of the southern portion of the Site as a plant nursery. Pesticide application may have occurred as a result of this use, which is a potential REC.		X
Past use	Undeveloped land.		X
Past use likely to indicate RECs	None.		X
Structures	None.		X
Roads	River Avenue and McHelen Avenue, both paved with asphalt.	X	
Topography of Site and surrounding area	Generally flat, with general slight southerly slope.		X
Aboveground storage tank (AST)	None.		X
Asbestos and lead	Not applicable (no structures).	X	
Below grade vaults	None.		X
Burned or buried debris	None.		X
Chemical storage	None.		X
Chemical mixing areas	None.		X
Discolored soil or water	None.		X
Ditches, streams	None.		X
Drains and piping (e.g. floor drains, floor trenches, bay drains, sand traps, grease traps)	None.		X
Drums	None.	X	
Electrical or hydraulic equipment (polychlorinated biphenyls [PCBs])	None.		X

TABLE 6-1 (continued)
SITE OBSERVATIONS

Interior and exterior observations or environmental conditions that may involve the use, storage, disposal or generation of hazardous substances or petroleum products.		Observed	Not Observed
Fill dirt from an unknown source.	None.		X
Fill dirt from a known source	None.		X
Hazardous chemical and petroleum products in connection with *known* use.	None.		X
Hazardous chemical and petroleum products in connection with *unknown* use.	None.		X
Non-hazardous containers with contents	None.		X
Hazardous waste storage	None.		X
Heating and cooling system and fuel source	Not applicable.		X
Industrial waste treatment equipment	None.		X
Loading and unloading areas	None.		X
Odors	None.		X
Pits, ponds, or lagoons	None.		X
Pools of liquid	None.		X
Process waste water	None.		X
Sanitary sewer system	None.		X
Septic system (e.g. tank and leach fields)	None.		X
Soil piles	None.		X
Solid waste/evidence of Unauthorized Dumping	None.		X
Stained pavement, soil or concrete	None.		X
Stains or corrosion (interior, non-water)	None		X
Storm drains/catch basins	None.		X
Stressed vegetation	None.		X

TABLE 6-1 (continued)
SITE OBSERVATIONS

Interior and exterior observations or environmental conditions that may involve the use, storage, disposal or generation of hazardous substances or petroleum products.		**Observed**	**Not Observed**
Sumps and clarifiers	None.		X
Surface water	None.		X
Underground storage tank(s) (including heating oil tanks)	None.		X
Unidentified substance containers	None.		X
Waste water discharge	None.		X
Water supplies (potable and process)	None.		X
Wells (irrigation, monitoring, or domestic)	None.		X
Wells (dry)	None.		X
Wells (oil and gas)	None.		X

6.4 RESULTS OF SITE RECONNAISSANCE

The Site includes an approximately 1,800-foot length of River Avenue and McHelen Avenue, which are contiguous asphalt-paved roadways. In addition, the southern portion of the Site consists of an approximately 100-foot by 250-foot area located within a parcel presently used as a plant nursery by Orange County Nursery, Inc.

Evidence of discolored soil or water, stressed vegetation, hazardous materials, ASTs, USTs, pits, ponds, or lagoons was not observed at the Site during the reconnaissance.

7.0 INTERVIEWS

Kleinfelder attempted to conduct interviews of "Key Site Managers" or other people knowledgeable of the Site, to obtain current and historical environmental information concerning the Site. The following sections highlight information revealed during the interviews.

7.1 INTERVIEW WITH OWNER/MANAGER

Kleinfelder forwarded an interview questionnaire to Roslyn Delmar of SCE, which (as Edison Securities Company, a corporation) owns APN 7317-015-800. To date, the completed interview questionnaire has not been returned. Should information subsequently provided alter our conclusions and recommendations, an addendum to this Phase I ESA will be provided.

7.2 INTERVIEW WITH OCCUPANTS

Kleinfelder also forwarded an interview questionnaire to Thelma Diaz of Orange County Nursery, Inc., the occupant of APN 7317-015-800. To date, the completed interview questionnaire has not been received. Should information subsequently provided alter our conclusions and recommendations, an addendum to this Phase I ESA will be provided.

7.3 INTERVIEWS WITH LOCAL GOVERNMENT OFFICIALS

See Section 7.4, Interview with Client/Others.

7.4 INTERVIEW WITH CLIENT / OTHERS

Kleinfelder forwarded an interview questionnaire to Mr. Frank Sanchez of the City of Long Beach. Mr. Sanchez discussed the presence of horticulture and a SCE substation on the portion of the Site located to the south of the terminus of River Avenue. He was unaware of the presence or use of ASTs, USTs, pesticides, or hazardous substances/chemicals at the Site.

Mr. Sanchez was not aware of environmental cleanup liens against the property that are filed or recorded under federal, tribal, state, or local law. He was also not aware of AULs such as engineering controls, land use restrictions, or institutional controls that are in place at the Site and/or have been filed or recorded in a registry under federal, tribal, state, or local law. Mr. Sanchez did not have specialized knowledge or experience related to the Site or nearby properties. He was unaware of the past uses of the Site and he also did not know of specific chemicals that are present or once were present at the Site. Further, Mr. Sanchez did not know of spills, chemical releases, or environmental cleanups that have taken place at the Site.

8.0 EVALUATION

Kleinfelder performed this Phase I ESA of the Site in conformance with the scope and limitations of ASTM Standard Practice E 1527-05. The following sections describe Kleinfelder's findings and provide general background information about the Site. Findings address RECs, historical RECs, and notation of *de minimus* quantities, as applicable to the Site. Business environmental risk issues are discussed in Section 8.3, Deviations and Additional Services. In summary, Kleinfelder's assessment revealed the following information concerning the Site:

8.1 BACKGROUND

River Avenue, from the intersection of River Avenue and West Wardlow Road to its southern terminus, was paved from at least 1928. McHelen Avenue was paved from at least 1947. The portion of the Site within APN 7317-015-800 where the detention basin is to be constructed appears to have remained undeveloped until sometime after 1994, but by 2002 was developed as a plant nursery.

8.2 FINDINGS AND OPINIONS

No obvious indications were observed during the Site reconnaissance that a release of hazardous materials/wastes or petroleum products has occurred at the Site. Kleinfelder identified no indication that pesticide application was performed on the portion of the Site located within the plant nursery, but the possibility of the use of pesticides at the Site cannot be ruled out. It is Kleinfelder's opinion that the plant nursery at the Site represents a potential recognized environmental condition (REC) to the Site.

No off-Site properties were observed to be a likely environmental concern to the Site.

The CSFM reported that there are several petroleum pipelines in the Site vicinity, and provided owner contact information to Kleinfelder; we then requested information concerning these pipelines from the owners, but have not received replies. The exact locations of these pipelines have therefore not been identified by Kleinfelder, but if they

are located within or immediately adjoining to the Site and leaks have occurred, they would represent a REC.

8.3 DEVIATIONS AND ADDITIONAL SERVICES

An evaluation of business environmental risk associated with the parcel(s) was not included in Kleinfelder's scope of services. The Phase I ESA does not incorporate non-scope considerations, such as asbestos-containing materials testing, radon, lead-based paint testing, lead in drinking water testing, wetlands, regulatory compliance, cultural and historical resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality, and high voltage power lines.

8.4 CONCLUSIONS AND RECOMMENDATIONS

We have performed a Phase I ESA, in conformance with the scope of work required by ASTM Standard Practice E 1527-05 and our Proposal Number 05809PROP/ LBE7P050, dated July 6, 2007, of the property referred to as the Proposed River Avenue Drain Phase II Project, in the City of Long Beach, California. Any exceptions to, or deviations from, this practice are described in Section 8.3 of this report. This assessment has revealed no evidence of RECs in connection with the Site except for the following:

- The southern portion of the Site is presently used as a plant nursery. Kleinfelder identified no indication that pesticide application was performed on the portion of the Site located within the plant nursery, but the possibility of the use of pesticides at the Site cannot be ruled out. It is Kleinfelder's opinion that the plant nursery at the Site represents a potential recognized environmental condition (REC) to the Site.

- The CSFM reported that there are several petroleum pipelines in the Site vicinity, and provided owner contact information to Kleinfelder. We then requested information concerning these pipelines from the owners, but have not received replies. The exact locations of these pipelines have therefore not been identified by Kleinfelder, but if they are located within or immediately adjoining to the Site and leaks have occurred, they would represent a REC.

8.4.1 Data Gaps

Although Kleinfelder attempted to obtain reasonably ascertainable information regarding the Site, some information was either not received or not readily available at the time of this report. At the time of preparation of this report, Kleinfelder has not received responses to our requests to review files for the Site (if any) from DTSC, LARWQCB SLIC Division, LASD, and several petroleum pipeline owners (ConocoPhillips, Defense Energy Support Ctr, Kinder Morgan, Kinder Morgan Pacific Pipeline System, LLC, and Paramount). Kleinfelder has also not received completed questionnaires from the owner and occupant of APN 7317-015-800. In Kleinfelder's opinion, the pending information concerning petroleum pipelines represents a significant data failure (data gap). Based on other information obtained, in Kleinfelder's opinion the remaining data gaps do not represent significant data failures.

9.0 REFERENCES

California Division of Mines and Geology (CDMG), 1961, *Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Appendix A Ground Water Geology*, Bulletin 104, June.

CDMG, 1962, *Geologic Map of California, Long Beach Sheet*, compiled by Charles W. Jennings, scale 1:250,000.

CDMG, 2001, *Seismic Hazard Evaluation of the Long Beach 7.5 Minute Quadrangle, Los Angeles County, Seismic Hazard Zones Report 028*, last revised January 13, 2006.

Environmental Data Resources, Inc. (EDR), 2008, *The EDR DatabMap® Area Study, Proposed River Avenue Drain Phase II Project, Long Beach, CA 90810*, Inquiry Number: 02203938.1r, April 30.

EDR, 2008, *GeoCheck® - Physical Setting Source Addendum, Proposed River Avenue Drain Phase II Project, Long Beach, CA 90810,* Inquiry Number: 2203497.2s, April 24.

EDR, 2008, *The EDR Aerial Photo Decade Package, Proposed River Avenue Drain Phase II Project, Long Beach, CA 90810*, Inquiry Number: 2203497.5, April 24.

EDR, 2008, *Certified Sanborn Map Report, Proposed River Avenue Drain Phase II Project, Long Beach, CA 90810,* Inquiry Number: 2203497.3, April 24.

EDR, 2008, *EDR Historical Topographic Map Report, Proposed River Avenue Drain Phase II Project, Long Beach, CA 90810*, Inquiry Number: 2203497.4, April 24.

FEMA, 1998, *Map Panel 0601360010C*, electronic file dated July 6.

Frey Environmental, Inc., 2007, *Groundwater Monitoring Well Monitoring and Sampling and Site Status Update, Third Quarter 2007, Sanesco Oil Company Station*

No. 5, 3631 Santa Fe Avenue, Long Beach, California (RWQCB ID# 908100161, Global ID #T0603701910), November 15.

State of California, Division of Oil, Gas, and Geothermal Resources, 2005, Map W1-6, electronic file dated April 16.

Additional sources may be referenced separately in the report text.

APPENDICES

These Appendices (i.e., to the Phase I Environmental Site Assessment, prepared by Kleinfelder, dated May 16, 2008) are available in their entirety for review at the City of Long Beach, Community Development Department, located at 333 West Ocean Boulevard, Long Beach, California 90802.

APPENDIX D:
Hydrology Report

November 8, 2005

TO: Sree Kumar
Design Division

Attention Joe Li

FROM: Rod H. Kubomoto
for Water Resources Division

RIVER AVENUE STORM DRAIN
CITY OF LONG BEACH
HYDROLOGY REPORT

In response to your request dated October 5, 2005, this memorandum provides hydrologic information for the watershed tributary to the River Avenue storm drain in the City of Long Beach. The information in this completed hydrology report will assist in developing solutions to the flooding problems along West Arlington Street.

The watershed has a tributary area of 237 acres (0.37 square miles). Approximately 42.6 percent of the watershed is in the City of Long Beach with 57.4 percent in the City of Carson.

As agreed upon in our meeting with Design Division on November 1, 2005, we have included the analyses for the 2-, 5-, 10-, 25-year frequency design storms. The hydrologic models of the watershed were developed using the Watershed Modeling System and the Modified Rational Method. The hydrologic analyses are based on the standards and procedures described in the 1991 Public Works Hydrology/Sedimentation Manual and the 2002 Hydrology Manual Addendum.

Attachments

A-1. Hydrologic map showing existing drainage area boundaries tributary to the River Avenue storm drain.

A-2. Aerial photograph showing existing drainage area boundaries tributary to the River Avenue storm drain.

B-1. Hydrologic data tables listing subarea sizes, subarea flow rates, and reach flow rates based on adequately collected runoff from a 2-year frequency design storm.

B-2. Hydrologic data tables listing subarea sizes, subarea flow rates, and reach flow rates based on adequately collected runoff from a 5-year frequency design storm.

B-3. Hydrologic data tables listing subarea sizes, subarea flow rates, and reach flow rates based on adequately collected runoff from a 10-year frequency design storm.

B-4. Hydrologic data tables listing subarea sizes, subarea flow rates, and reach flow rates based on adequately collected runoff from a 25-year frequency design storm.

C. Supporting information including design parameters and street flooding analysis.

D. Design Division's request dated October 5, 2005.

Summary of Findings

- Flow rates from subareas 10B and 18C represent runoff from a 50-year frequency design storm due to sump conditions for the 10- and 25-year frequency storm analyses only.
- The adequately collected peak flow from a 2-year frequency storm for the area tributary to the River Avenue storm drain is 65 cubic feet per second (cfs).
- The adequately collected peak flow from a 5-year frequency storm for the area tributary to the River Avenue storm drain is 111 cubic feet per second (cfs).
- The adequately collected peak flow from a 10-year frequency storm for the area tributary to the River Avenue storm drain is 150 cubic feet per second (cfs).
- The adequately collected peak flow from a 25-year frequency storm for the area tributary to the River Avenue storm drain is 191 cubic feet per second (cfs).

If you have any questions, please contact Jessica Murphy at 458-6133.

JM:ac
C:\Documents and Settings\jmurphy\Desktop\River Avenue\files\River Ave Memo.doc

Attach.

cc: Water Resources (Araiza, Files)

APPENDIX E:
Noise Data

Site Number: RI001
Recorded By: Eddie Torres
Job Number: 10-106837
Date: 6/16/09
Time: 12:53 p.m.
Location: Residential uses along River Avenue near Lincoln Street
Source of Peak Noise: Vehicles

Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
57.8	45.6	70.4	82

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Brüel & Kjær	2250	2548189	11/14/2007	
	Microphone	Brüel & Kjær	4189	2543364	11/15/2007	
	Preamp	Brüel & Kjær	ZC 0032	4265	7/18/2006	
	Calibrator	Brüel & Kjær	4231	2545667	7/31/2006	

Weather Data			
Est.	Duration: 10 minutes		Sky: ☼
	Note: dBA Offset = 0.06		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (hPa)
	0.4	76.4	1017

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		06/16/2009 12:53:30
End Time:		06/16/2009 13:03:30
Elapsed Time:		00:10:00
Bandwidth:		Broadband
Max Input Level:		140.20

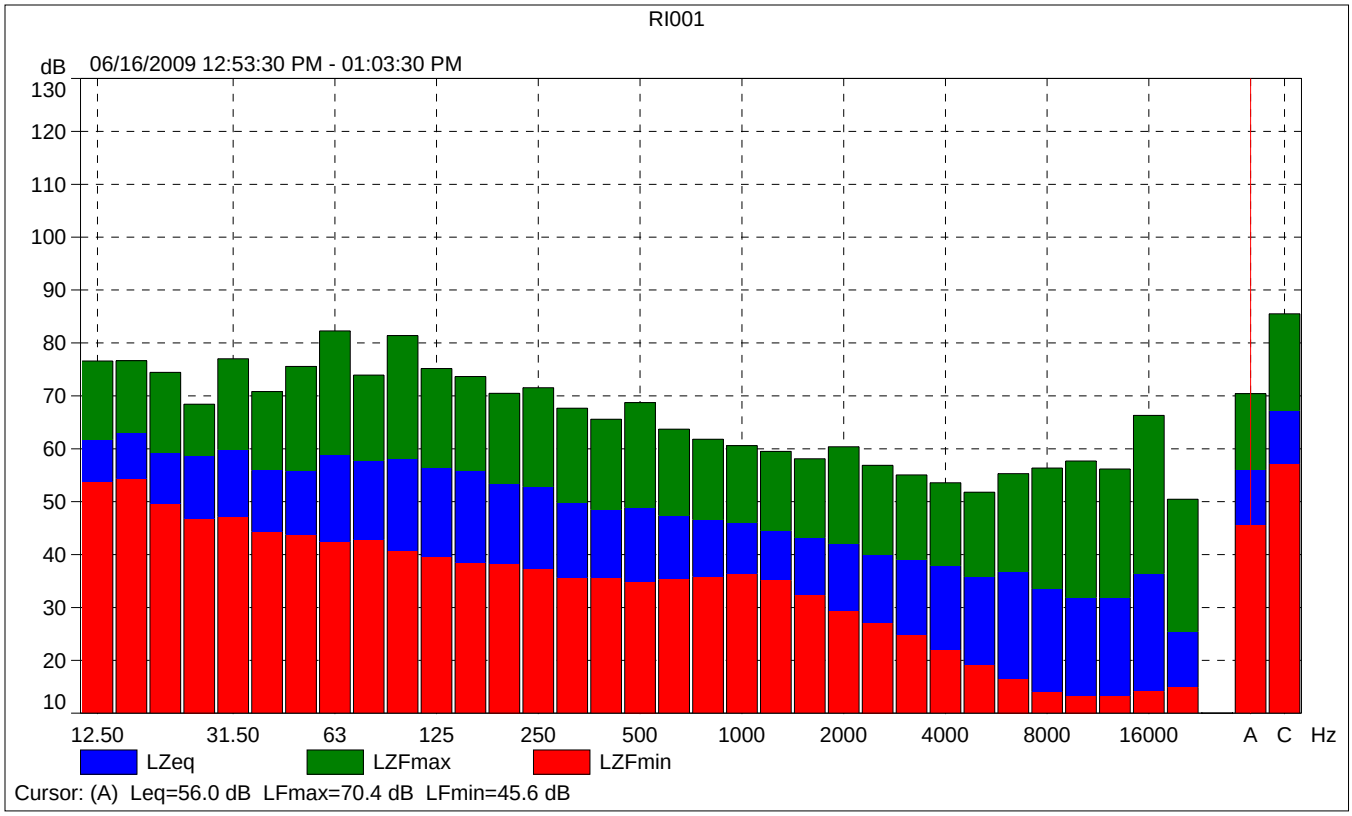
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

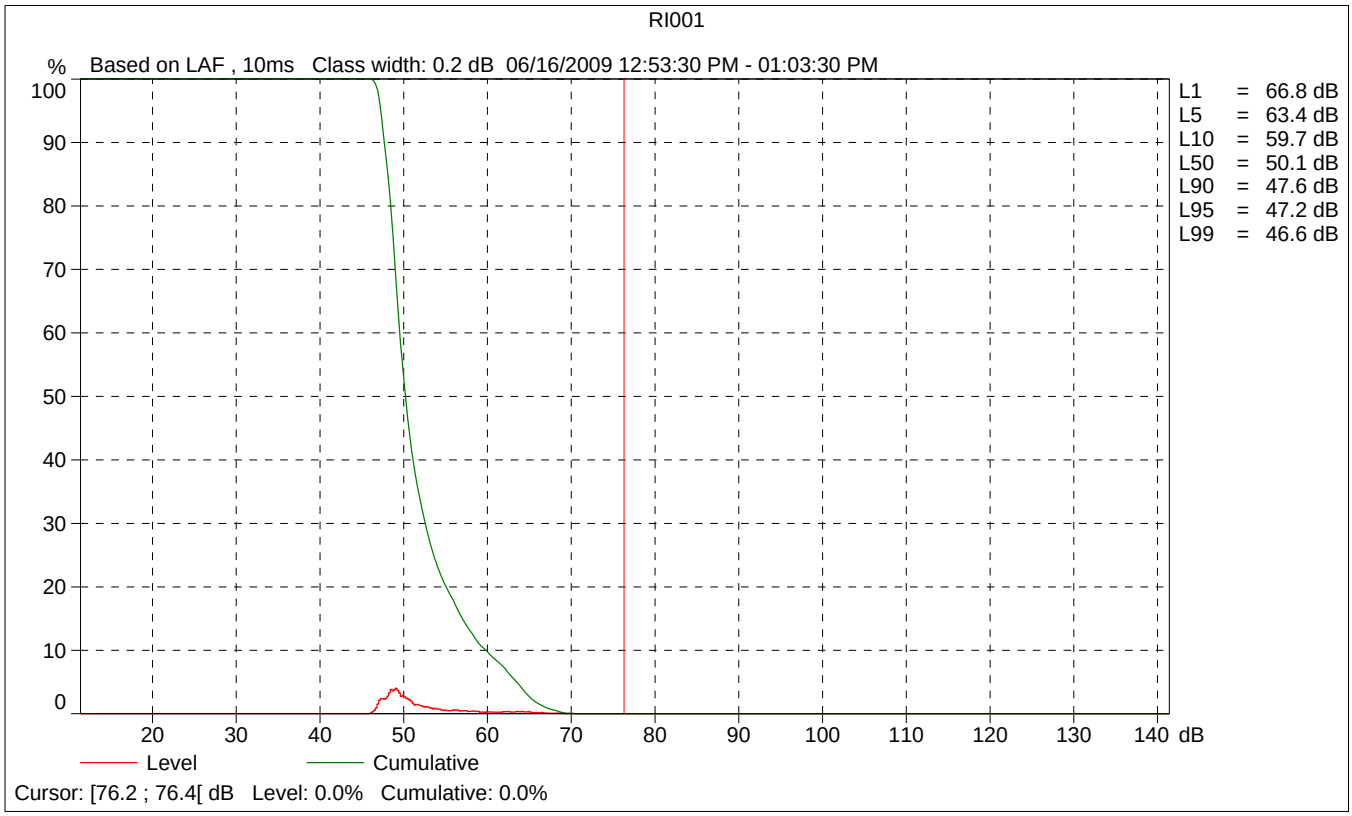
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

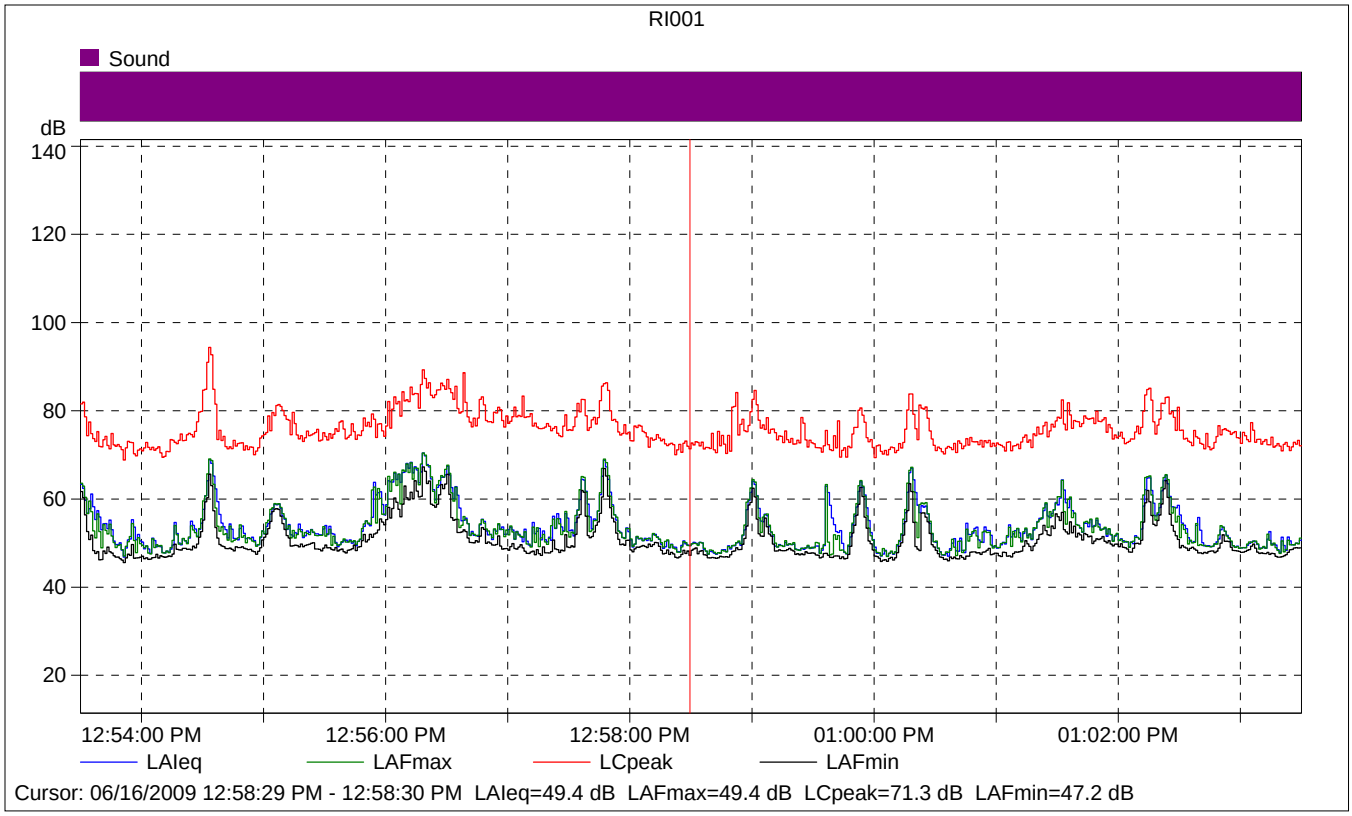
Calibration Time:		06/16/2009 11:19:17
Calibration Type:		External reference
Sensitivity:		54.51 mV/Pa

RI001

	Start time	End time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			---	57.8	70.4	45.6
Time	12:53:30 PM	01:03:30 PM				
Date	06/16/2009	06/16/2009				

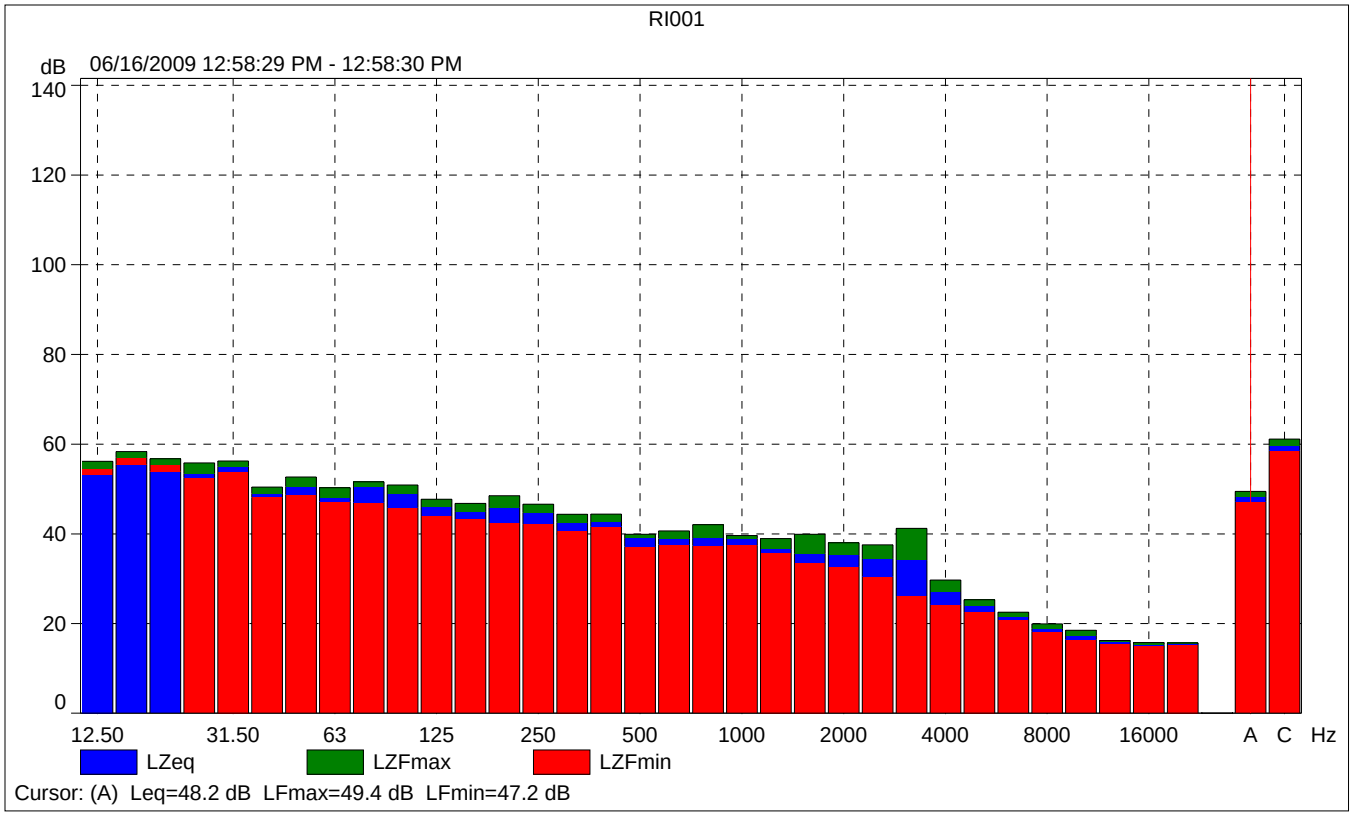

RI001
dB
06/16/2009 12:53:30 PM - 01:03:30 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=56.0 dB LFmax=70.4 dB LFmin=45.6 dB

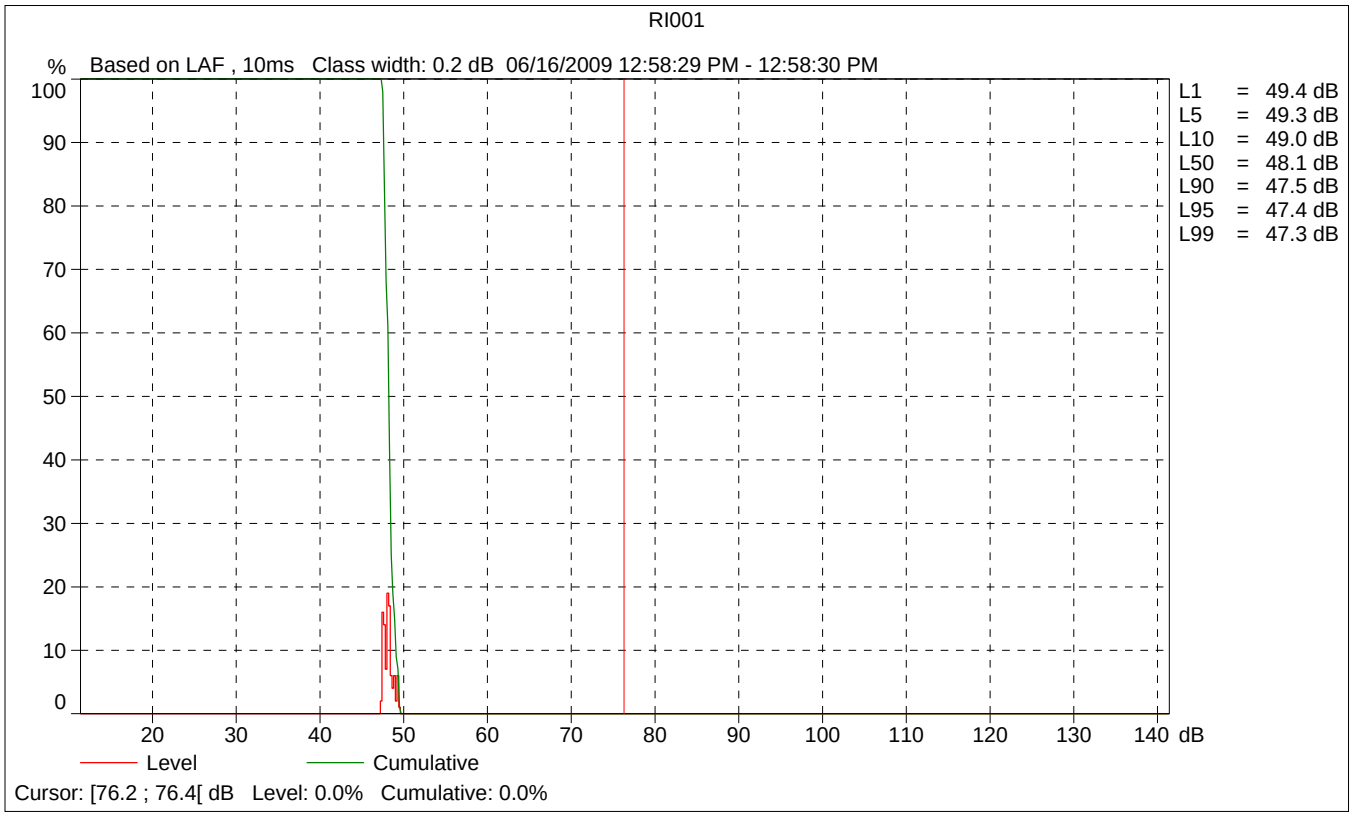

RI001
%
Based on LAF , 10ms Class width: 0.2 dB 06/16/2009 12:53:30 PM - 01:03:30 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 66.8 dB
L5 = 63.4 dB
L10 = 59.7 dB
L50 = 50.1 dB
L90 = 47.6 dB
L95 = 47.2 dB
L99 = 46.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

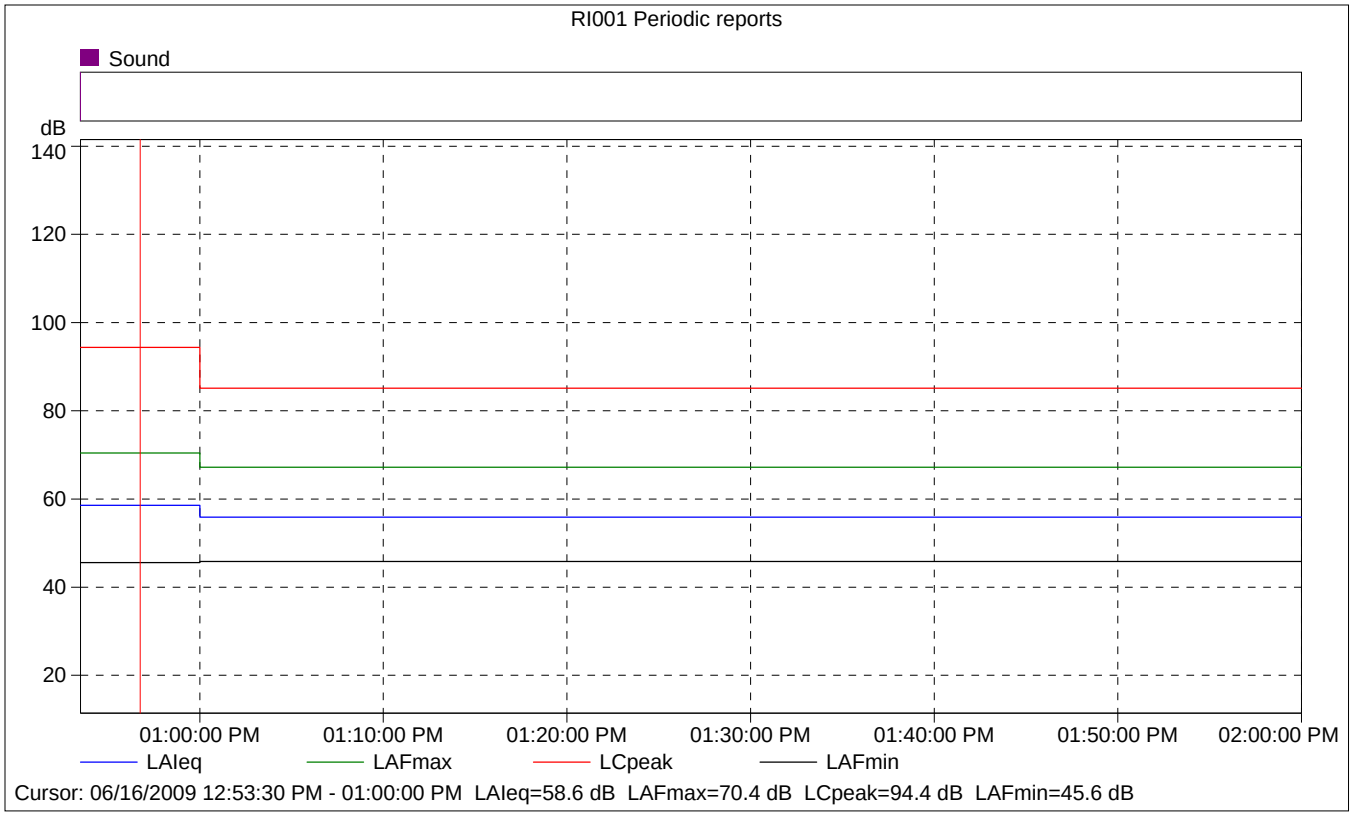


RI001

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			49.4	49.4	47.2
Time	12:58:29 PM	0:00:01			
Date	06/16/2009				

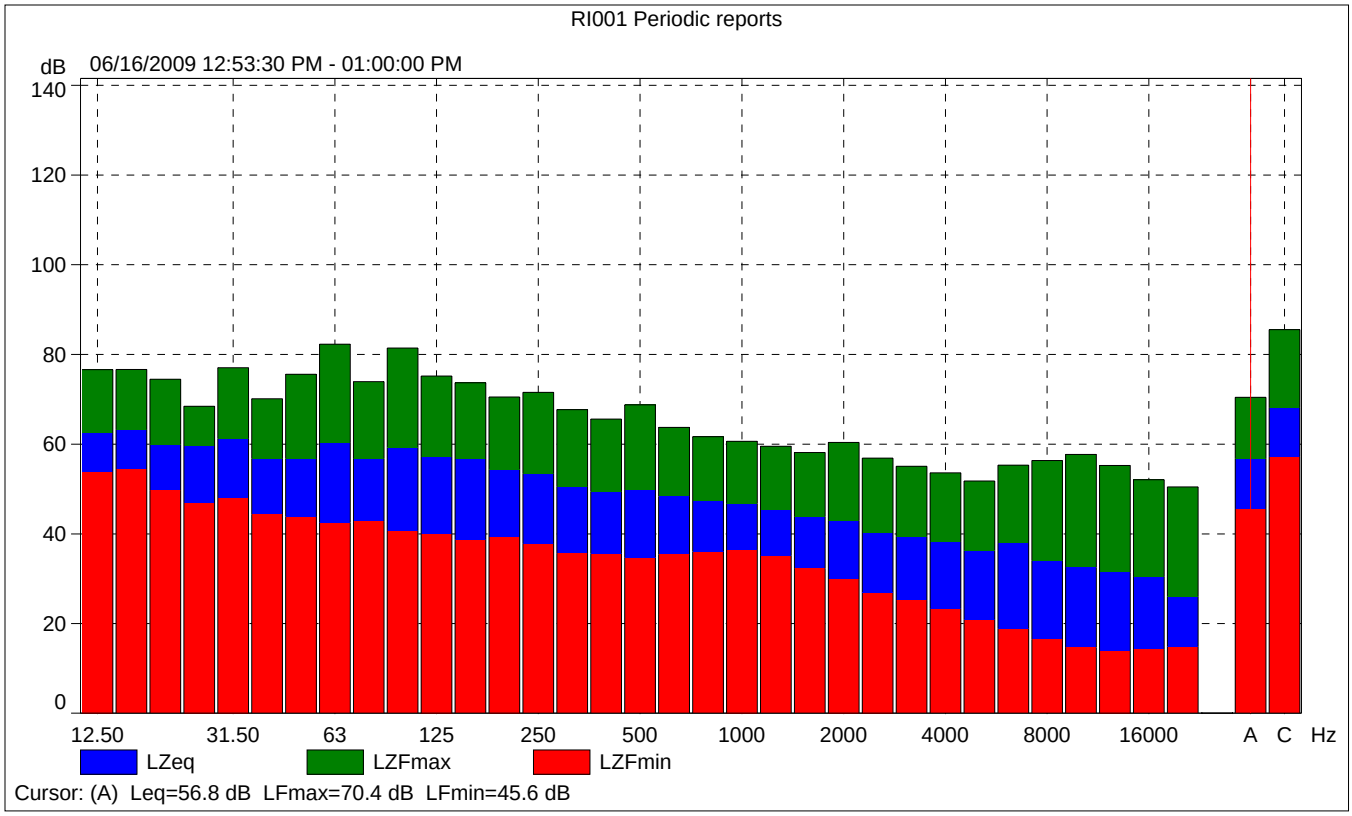

RI001
dB
06/16/2009 12:58:29 PM - 12:58:30 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=48.2 dB LFmax=49.4 dB LFmin=47.2 dB

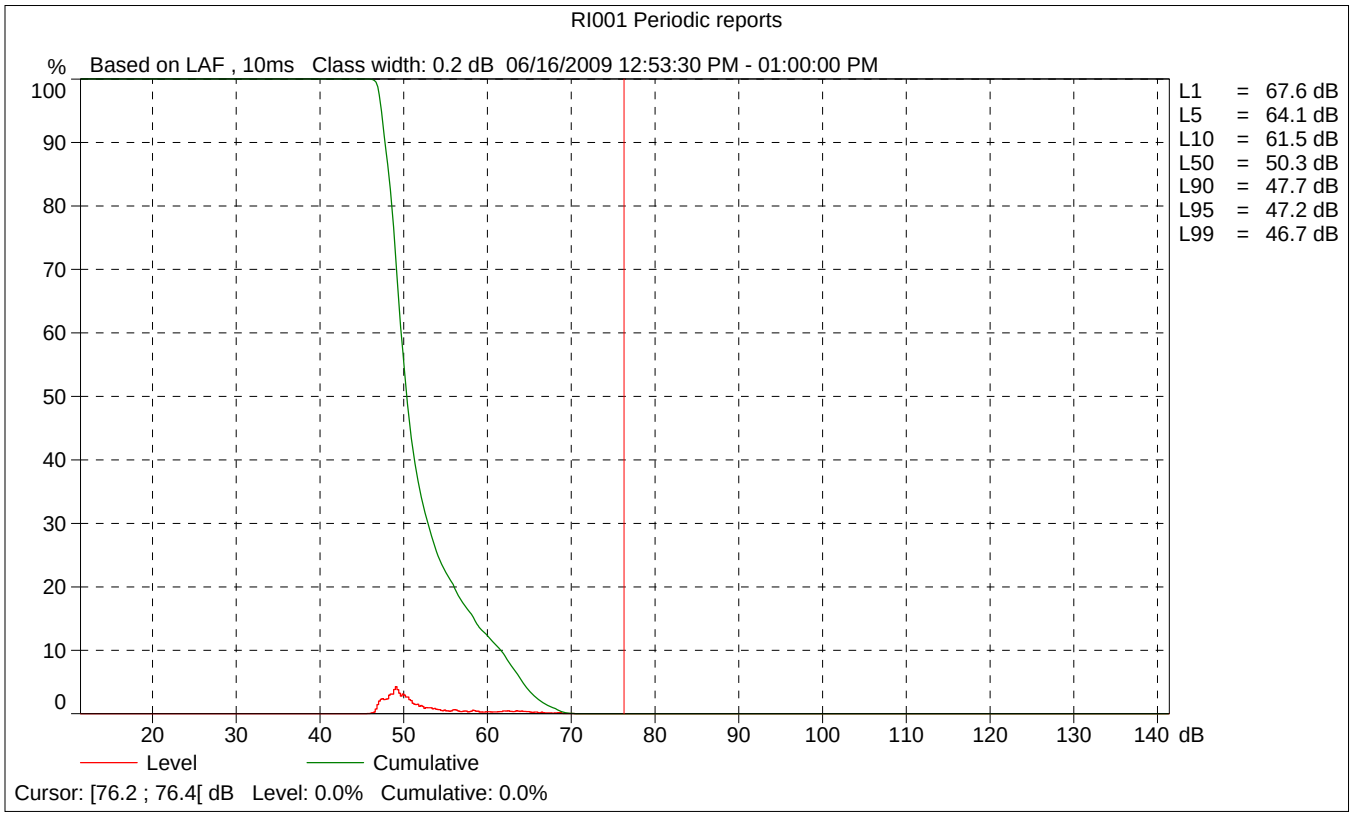

RI001
%
Based on LAF , 10ms Class width: 0.2 dB 06/16/2009 12:58:29 PM - 12:58:30 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 49.4 dB
L5 = 49.3 dB
L10 = 49.0 dB
L50 = 48.1 dB
L90 = 47.5 dB
L95 = 47.4 dB
L99 = 47.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

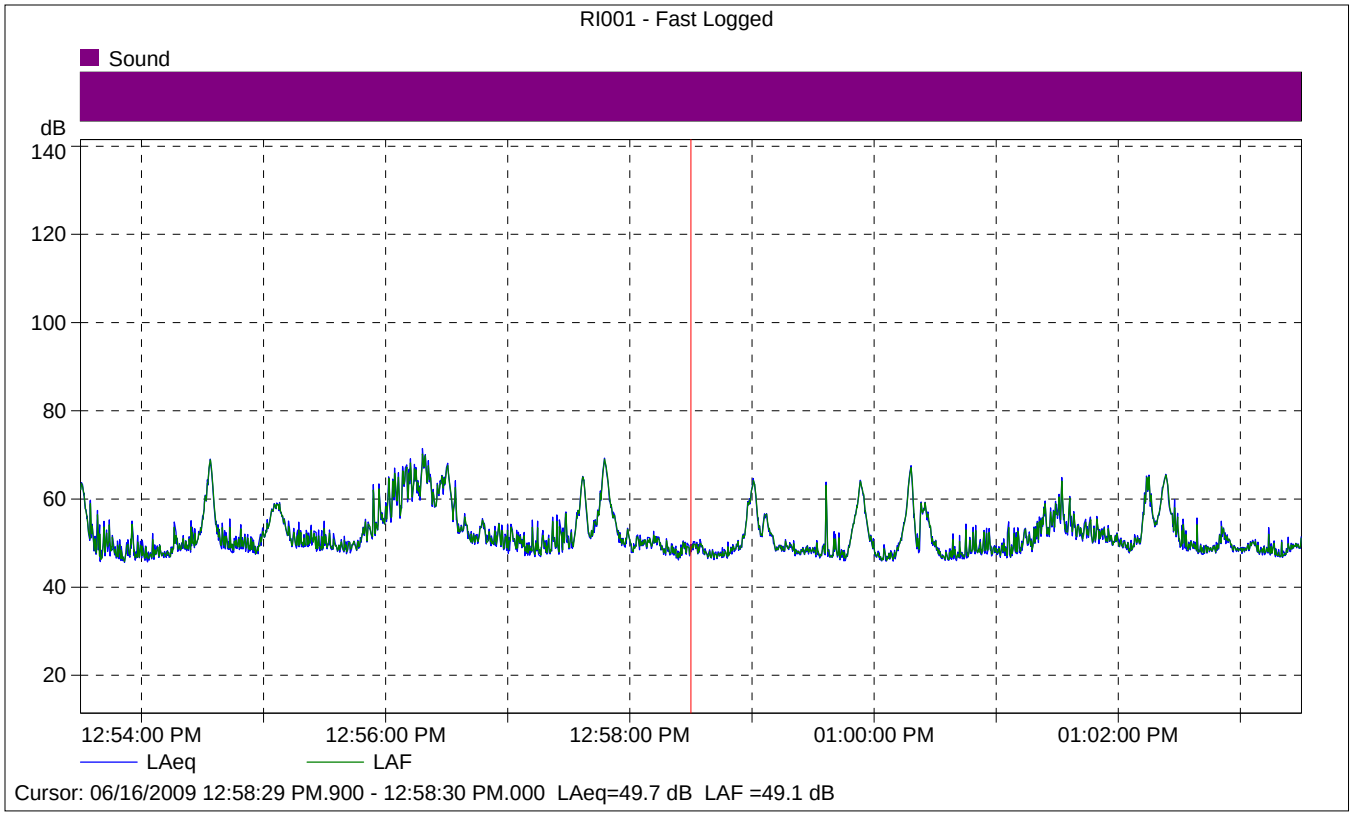


RI001 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	58.6	70.4	45.6
Time	12:53:30 PM	0:06:30				
Date	06/16/2009					


RI001 Periodic reports
dB
06/16/2009 12:53:30 PM - 01:00:00 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=56.8 dB LFmax=70.4 dB LFmin=45.6 dB


RI001 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 06/16/2009 12:53:30 PM - 01:00:00 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 67.6 dB
L5 = 64.1 dB
L10 = 61.5 dB
L50 = 50.3 dB
L90 = 47.7 dB
L95 = 47.2 dB
L99 = 46.7 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



RI001 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			49.7
Time	12:58:29 PM.900	0:00:00.100	
Date	06/16/2009		

Roadway Construction Noise Model (RCNM),Version 1.0

Report date 7/16/2009
Case Desc Demolition

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		110	0
Front End Loader	No	40		79.1	110	0
Concrete Saw	No	20		89.6	110	0
Dozer	No	40		81.7	110	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	77.2	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	72.3	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	82.7	75.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	74.8	70.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	82.7	78.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
East	Residential	1	1	1

			Equipment Spec	Actual	Receptor	Estimated

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Tractor	No	40	84		18	0
Front End Loader	No	40		79.1	18	0
Concrete Saw	No	20		89.6	18	0
Dozer	No	40		81.7	18	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	92.9	88.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	88	84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	98.5	91.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	90.5	86.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	98.5	94.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
South	Residential	1	1	1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		1000	0
Front End Loader	No	40		79.1	1000	0
Concrete Saw	No	20		89.6	1000	0
Dozer	No	40		81.7	1000	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	58	54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Front End Loader	53.1	49.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	63.6	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	55.6	51.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.6	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
West	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		18	0
Front End Loader	No	40		79.1	18	0
Concrete Saw	No	20		89.6	18	0
Dozer	No	40		81.7	18	0

	Calculated (dBA)		Results Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	92.9	88.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	88	84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	98.5	91.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	90.5	86.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	98.5	94.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date 7/16/2009
Case Desc Trenching

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	110	0
Excavator	No	40		80.7	110	0
All Other Equipment > 5	No	50	85		110	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Excavator	73.9	69.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	73.9	69.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5	78.2	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	78.2	77.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
East	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)

Excavator	No	40		80.7	18	0
Excavator	No	40		80.7	18	0
All Other Equipment > 5	No	50	85		18	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	89.6	85.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	89.6	85.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5	93.9	90.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	93.9	92.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
South	Residential	1	1	1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1000	0
Excavator	No	40		80.7	1000	0
All Other Equipment > 5	No	50	85		1000	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	54.7	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	54.7	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5	59	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
West	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	18	0
Excavator	No	40		80.7	18	0
All Other Equipment > 5	No	50	85		18	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Excavator	89.6	85.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	89.6	85.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5	93.9	90.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	93.9	92.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date 7/16/2009
Case Desc Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Drum Mixer	No	50		80	110	0
Drum Mixer	No	50		80	110	0
Drum Mixer	No	50		80	110	0
Drum Mixer	No	50		80	110	0
Paver	No	50		77.2	110	0
Roller	No	20		80	110	0
Tractor	No	40	84		110	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Drum Mixer	73.2	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	73.2	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	73.2	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	73.2	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	70.4	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	73.2	66.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	77.2	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	77.2	78.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
East	Residential	1	1	1

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Drum Mixer	No	50		80	18	0
Drum Mixer	No	50		80	18	0
Drum Mixer	No	50		80	18	0
Drum Mixer	No	50		80	18	0
Paver	No	50		77.2	18	0
Roller	No	20		80	18	0
Tractor	No	40	84		18	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	86.1	83.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	88.9	81.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	92.9	88.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	92.9	94.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
South	Residential	1	1	1

		Equipment			
		Spec	Actual	Receptor	Estimated

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Drum Mixer	No	50		80	1000	0
Drum Mixer	No	50		80	1000	0
Drum Mixer	No	50		80	1000	0
Drum Mixer	No	50		80	1000	0
Paver	No	50		77.2	1000	0
Roller	No	20		80	1000	0
Tractor	No	40	84		1000	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Drum Mixer	54	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	54	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	54	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	54	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	51.2	48.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	54	47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58	54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	58	59.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
West	Residential	1	1	1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Drum Mixer	No	50		80	18	0
Drum Mixer	No	50		80	18	0
Drum Mixer	No	50		80	18	0
Drum Mixer	No	50		80	18	0

Paver	No	50		77.2	18	0
Roller	No	20		80	18	0
Tractor	No	40	84		18	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	88.9	85.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	86.1	83.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	88.9	81.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	92.9	88.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	92.9	94.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.