

CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The potential environmental effects resulting from implementation of the Proposed Action, Project Alternative A, and the No Action Alternative are presented in this chapter. These alternatives are summarized below and discussed in detail in **Chapter 2** of this Environmental Assessment (EA).

4.1.1 THE PROPOSED ACTION

- Shift Runway 15-33 by 75 feet to the southeast;
- Implement runway-specific Runway Safety Area (RSA) Alternative 7B for Runways 9R-27L and 9L-27R in North Field; and
- **Implement runway-specific RSA Alternative 2A for Runway 11-29 in South Field.**

4.1.2 PROJECT ALTERNATIVE A

- Shift Runway 15-33 by 75 feet to the southeast;
- Implement runway-specific RSA Alternative 7B for Runways 9R-27L and 9L-27R in North Field; and
- **Implement runway-specific Alternative 2 for Runway 11-29 in South Field.**

4.1.3 NO ACTION ALTERNATIVE

- No improvements to the RSAs of Runways 15-33, 9R-27L, 9L-27R, and 11-29.

The two action alternatives differ only by the inclusion of South Field runway-specific RSA Alternative 2A in the Proposed Action, and South Field runway-specific RSA Alternative 2 (in Project Alternative A).

The analysis of potential effects on environmental resources discussed in this chapter includes an overview of impacts, methodology, thresholds of significance, and potential direct and indirect impacts. Potential cumulative impacts resulting from the incremental effects of the alternatives when added to the effects of past, present, and reasonably foreseeable future actions are also analyzed. Where necessary, mitigation measures are discussed that would reduce or eliminate anticipated environmental impacts for each of the action alternatives, or compensate for unavoidable impacts.

The discussion of impacts in this chapter focuses on the potential environmental impacts associated with the proposed improvements at Runways 9L-27R, 9R-27L, and 11-29. The impacts of the proposed improvements to Runway 15-33 were included in the analyses presented herein. Under both the Proposed Action and Project Alternative A, Runway 15-33 would be shifted by 75 feet to the southeast through repainting threshold markings on existing pavement. Repainting the threshold markings would not cause an increase or change in airport activity, runway usage or airport-noise levels over noise-sensitive land uses areas within the 65 Community Noise Equivalent Level (CNEL) noise contour.

In addition, although shifting the runway threshold would require adjustment of the runway edge lighting, there would be no significant change in light emissions during the day or night. Similarly, the proposed improvements to Runway 15-33 are on existing pavement and require no other ground-disturbing activities. Therefore, the proposed remarking of the threshold for Runway 15-33 would not affect any of the following environmental impact categories: compatible land use; socioeconomics; air quality; water resources; fish, wildlife, and plants; wetlands and other waters of the U.S.; floodplains; coastal resources; cultural resources; natural resources; or hazardous materials and solid waste.

In accordance with guidance provided in Federal Aviation Administration (FAA) Orders 1050.1E, *Environmental Impacts: Policies and Procedures*, and 5050.4B, *National Environmental Policy Act Implementing Instructions for Airport Actions* (FAA, 2006b), the following environmental resources are not present within the Detailed Study Area (DSA), and therefore would not be affected by the Proposed Action, Project Alternative A, or the No Action Alternative:

- **Farmlands.** There are no important farmlands in the vicinity of Oakland International Airport (OAK or Airport) (CDOC, 2008; USDA, 2004);
- **Wild and Scenic Rivers.** The American (Lower) River, approximately 50 miles northeast of the Airport, in Sacramento, is the closest Wild and Scenic River segment (NPS, 2011); and
- **Coastal Barriers.** There are no coastal barrier islands in the vicinity of San Francisco Bay.

4.2 NOISE

This section addresses the future (2015 and 2020) aircraft noise environment related to the No Action, Proposed Action, and Project Alternative A in the General Study Area (GSA), and the methodology used to determine future aircraft noise exposure. The terms and metrics associated with aircraft noise used in the noise analysis are described in detail in **Appendix B, Fundamentals of Aircraft Noise**.

4.2.1 OVERVIEW OF IMPACTS

Neither the Proposed Action nor Project Alternative A would change the operational conditions at the Airport. All assumptions remain the same as those defined for the 2010 existing conditions, except the location of the takeoff and landing points on Runway 11-29, Runway 9L, and Runway 15-33.

When compared to the No Action Alternative, neither the Proposed Action nor Project Alternative A would cause noise-sensitive areas located at or above 65 decibel (dB) CNEL to experience a noise increase of at least CNEL 1.5 dB. Therefore, neither the Proposed Action nor Project Alternative A would result in a significant noise impact.

4.2.2 METHODOLOGY

Noise analysis was conducted to reflect forecast conditions for the No Action Alternative, the Proposed Action, and Project Alternative A. This analysis includes maps depicting general and noise-sensitive land uses within the noise impact area and generalized flight tracks. Noise exposure tables were developed to evaluate land use information and population data, including the following:

- The number of residences or people living within each noise contour at or above 65 dB CNEL;
- The locations and numbers of noise-sensitive land uses within each contour at or above 65 dB CNEL; and
- The area (in acres) of general land use classifications within the noise contours.

In accordance with guidance contained in FAA Order 1050.1E, detailed noise analyses were performed using the latest version of the FAA's Integrated Noise Model (Version 7.0b, released on September 30, 2009). The Integrated Noise Model is FAA's standard noise modeling tool for predicting noise levels in the vicinity of airports. CNEL contours of equal noise for the 65, 70, and 75 A-weighted decibel (dBA) levels were calculated based on the FAA Terminal Area Forecast for the 2015 and 2020 time frame (FAA, 2012a).

The data and methodologies used to develop the noise contours for the future condition are provided in **Appendix B, Noise Modeling Methodology**.

Operations

The future noise environment for OAK was analyzed based on FAA Terminal Area Forecast forecasted operational conditions for 2015 and 2020. These forecasted operational conditions are summarized in **Table 4.2-1**.

**Table 4.2-1
Existing and Forecast Aircraft Operations**

Aircraft Category	Annual Operations	
	TAF 2015	TAF 2020
Air Carrier	114,321	126,838
Air Taxi	25,169	27,518
General Aviation	86,146	96,725
Military	556	556
Total Operations	226,192	251,637

Note:

TAF = Terminal Area Forecast

Source: Existing data are based on HMMH, 2011. TAF data are from FAA, 2012. Forecast military data were adjusted based on actual military operations for 2010.

A detailed description of the aircraft operations and Airport operational characteristics is provided in **Appendix B, Noise Modeling Methodology**. Fleet mix, runway use, time of day, flight tracks and flight track use, and departure procedures remain the same as under the 2010 existing conditions.

4.2.3 THRESHOLDS OF SIGNIFICANCE

The threshold of significance is defined in FAA Order 1050.1E, which states that a significant noise impact would occur if the analysis shows that the proposed action would cause noise-sensitive areas to experience an increase in noise of 1.5 dB CNEL or more at or above 65 dB CNEL, when compared to the

No Action Alternative for the same time frame. Therefore, the potential noise impact analysis involved a comparison of whether the Proposed Action and Project Alternative A caused a 1.5 dB CNEL increase in noise-sensitive areas located within the 65-dB CNEL contour.

As indicated in **Section 3.2.4.1** of this document, there are no noise level limits set by local agencies for construction activities occurring during allowed hours (typically 7:00 a.m. to 7:00 p.m.). For the purpose of this analysis, noise generated from construction activities was analyzed in comparison with the Alameda County Noise Ordinance Code, Section 6.60.

4.2.4 OPERATIONAL IMPACTS

Year 2015

No Action Alternative

The data and methodologies used to develop the noise contours are provided in **Appendix B, Noise Modeling Methodology**. The No Action Alternative CNEL contours are presented in **Figure 4.2-1** and the estimated noise exposure levels are presented in **Table 4.2-2**. A detailed discussion of land uses within the GSA is provided in **Section 4.3, Compatible Land Use**, of this EA.

Proposed Action and Project Alternative A

The data and methodologies used to develop the noise contours for the existing condition are provided in **Appendix B, Noise Modeling Methodology**. The CNEL contours for the Proposed Action and Project Alternative A are presented in **Figures 4.2-2** and **4.2-5**, and the associated estimated noise exposure levels are presented in **Table 4.2-3**. A detailed discussion of land uses within the GSA is provided in **Section 4.3, Compatible Land Use**, of this EA.

Year 2020

No Action Alternative

The data and methodologies used to develop the noise contours are provided in **Appendix B**. CNEL contours of the No Action Alternative are presented in **Figure 4.2-3**, and estimated noise exposure levels are presented in **Table 4.2-4**. A detailed discussion of land uses within the GSA is provided in **Section 4.3, Compatible Land Use**, of this EA.

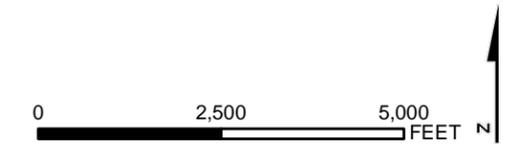
Proposed Action and Project Alternative A

The data and methodologies used to develop the noise contours are provided in **Appendix B, Noise Modeling Methodology**. The CNEL contours for the Proposed Action and Project Alternative A are presented in **Figures 4.2-4** and **4.2-6**, and the associated estimated noise exposure levels are presented in **Table 4.2-5**. A detailed discussion of land uses within the GSA is provided in **Section 4.3, Compatible Land Use**, of this EA.



- 65 CNEL Noise Contour
- 70 CNEL Noise Contour
- 75 CNEL Noise Contour
- School
- Church
- Child Care
- Elderly Care
- Park
- Golf Course
- Hotel
- City Limits
- Airport Boundary
- Generalized Study Area
- Detailed Study Area

- LAND USE DESIGNATIONS**
- Residential
 - Public Use
 - Commercial Use
 - General Industrial/Transportation
 - Recreational



Sources (Adapted from the best available data):
 - Dept. of Social Services (CA), City of Oakland, 2009
 - CAL-Atlas, 2011; INM v7.0b; URS, 2011

2015 NO ACTION NOISE EXPOSURE CONTOURS

28067867 Oakland International Airport
Oakland, California

FIGURE 4.2-1

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- 65 CNEL Noise Contour
- 70 CNEL Noise Contour
- 75 CNEL Noise Contour
- School
- Church
- Child Care
- Elderly Care
- Park
- Golf Course
- Hotel
- Proposed Threshold Relocation
- City Limits
- Airport Boundary
- Generalized Study Area
- Detailed Study Area

- LAND USE DESIGNATIONS**
- Residential
 - Public Use
 - Commercial Use
 - General Industrial/Transportation
 - Recreational

0 2,500 5,000 FEET N

Sources (Adapted from the best available data):
 - Dept. of Social Services (CA), City of Oakland, 2009
 - CAL-Atlas, 2011; INM v7.0b; URS, 2011

2020 NO ACTION NOISE EXPOSURE CONTOURS

Oakland International Airport
 Oakland, California

28067867

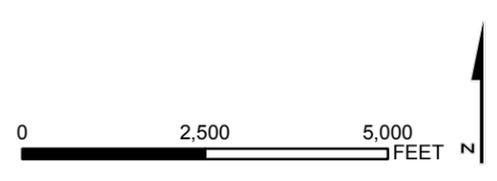
FIGURE 4.2-3

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- 65 CNEL Noise Contour
- 70 CNEL Noise Contour
- 75 CNEL Noise Contour
- School
- Church
- Child Care
- Elderly Care
- Park
- Golf Course
- Hotel
- Proposed Threshold Relocation
- City Limits
- Airport Boundary
- Generalized Study Area
- Detailed Study Area

- LAND USE DESIGNATIONS**
- Residential
 - Public Use
 - Commercial Use
 - General Industrial/Transportation
 - Recreational



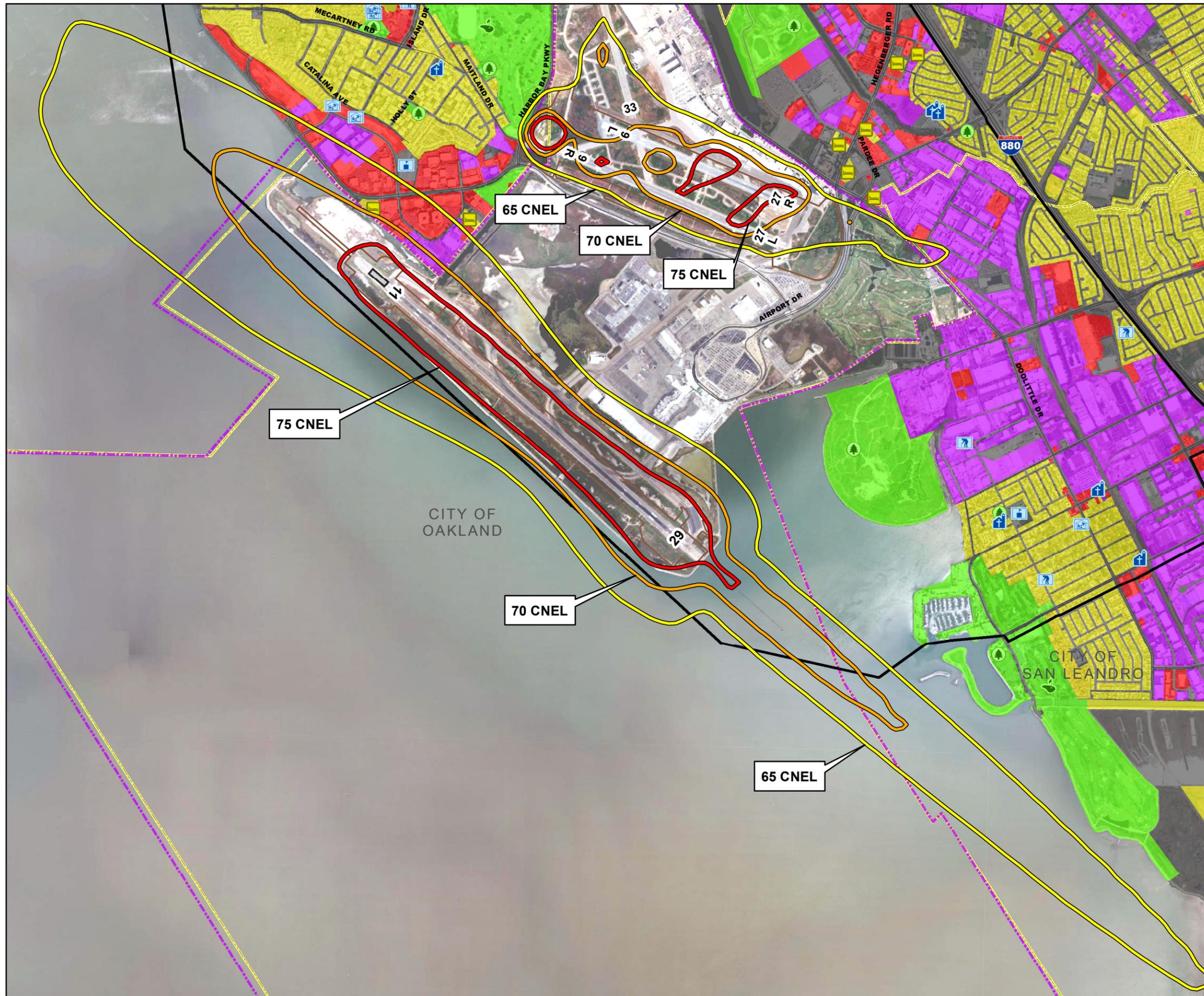
Sources (Adapted from the best available data):
 - Dept. of Social Services (CA), 2011; City of Oakland, 2009
 - CAL-Atlas, 2011; INM v7.0b; URS, 2011

**2015 PROJECT ALTERNATIVE A
 NOISE EXPOSURE CONTOURS**

Oakland International Airport
 Runway Safety Area Program EA
 Oakland, California

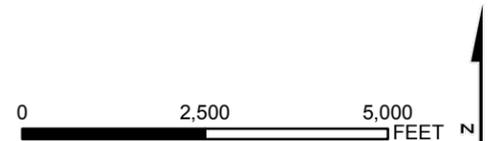
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FIGURE 4.2-5



- 65 CNEL Noise Contour
- 70 CNEL Noise Contour
- 75 CNEL Noise Contour
- School
- Church
- Child Care
- Elderly Care
- Park
- Golf Course
- Hotel
- Proposed Threshold Relocation
- City Limits
- Airport Boundary
- Generalized Study Area
- Detailed Study Area

- LAND USE DESIGNATIONS**
- Residential
 - Public Use
 - Commercial Use
 - General Industrial/Transportation
 - Recreational



Sources (Adapted from the best available data):
 - Dept. of Social Services (CA), 2011; City of Oakland, 2009
 - CAL-Atlas, 2011; INM v7.0b; URS, 2011

**2020 PROJECT ALTERNATIVE A
 NOISE EXPOSURE CONTOURS**

Oakland International Airport
 Runway Safety Area Program EA
 Oakland, California

28067867

FIGURE 4.2-6

**Table 4.2-2
2015 No Action Alternative Noise Exposure**

Number of Noise-Sensitive Land Uses and Sites	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Residential	0	0	0
	0	0	0
	0 ⁽¹⁾	0	0
Public Use	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Commercial Use	0 ⁽¹⁾	0	0
	0	0	0
	0 ⁽¹⁾	0	0
	0	0	0
	0	0	0
Manufacturing and Production	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Recreational	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Population Estimates and Housing Unit Estimates	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Number of People	0	0	0
Number of Housing Units	0	0	0

Notes:

¹ For the purposes of this study, the hotel located within the 65 to 70 CNEL noise contours complies with indoor noise reduction standards; therefore, it is not considered a noise-sensitive site. There are no other residential land uses or sites within the noise contours.

CNEL = Community Noise Level Equivalent

Source: Adapted from the best available data: California Department of Social Services, 2011; Alameda County, 2011; CAL-Atlas, 2011.

**Table 4.2-3
2015 Proposed Action and Project Alternative A Noise Exposure**

Number of Noise-Sensitive Land Uses and Sites	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Residential	0	0	0
	0	0	0
	0 ⁽¹⁾	0	0
Public Use	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Commercial Use	0 ⁽¹⁾	0	0
	0	0	0
	0 ⁽¹⁾	0	0
	0	0	0
	0	0	0
Manufacturing and Production	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Recreational	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Population Estimates and Housing Unit Estimates	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Number of People	0	0	0
Number of Housing Units	0	0	0

Notes:

¹ For the purposes of this study, the hotel located within the 65 to 70 CNEL noise contours complies with indoor noise reduction standards; therefore, it is not considered a noise-sensitive site. There are no other residential land uses or sites within the noise contours.

CNEL = Community Noise Level Equivalent

Source: Adapted from the best available data: California Department of Social Services, 2011; Alameda County, 2011; CAL-Atlas, 2011.

**Table 4.2-4
2020 No Action Alternative Noise Exposure**

Number of Noise-Sensitive Land Uses and Sites	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Residential	0	0	0
	0	0	0
	0 ⁽¹⁾	0	0
Public Use	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Commercial Use	0 ⁽¹⁾	0	0
	0	0	0
	0 ⁽¹⁾	0	0
	0	0	0
	0	0	0
Manufacturing and Production	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Recreational	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Population Estimates and Housing Unit Estimates	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Number of People	0	0	0
Number of Housing Units	0	0	0

Notes:

¹ For the purposes of this study, the hotel located within the 65 to 70 CNEL noise contours complies with indoor noise reduction standards; therefore, it is not considered a noise-sensitive site. There are no other residential land uses or sites within the noise contours.

CNEL = Community Noise Level Equivalent

Source: Adapted from the best available data: California Department of Social Services, 2011; Alameda County, 2011; CAL-Atlas, 2011.

**Table 4.2-5
2020 Proposed Action and Project Alternative A Noise Exposure**

Number of Noise-Sensitive Land Uses and Sites	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Residential	0	0	0
	0	0	0
	0 ⁽¹⁾	0	0
Public Use	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Commercial Use	0 ⁽¹⁾	0	0
	0	0	0
	0 ⁽¹⁾	0	0
	0	0	0
	0	0	0
Manufacturing and Production	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Recreational	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Population Estimates and Housing Unit Estimates	65 to 70 CNEL	70 to 75 CNEL	Over 75 CNEL
Number of People	0	0	0
Number of Housing Units	0	0	0

Notes:

¹ For the purposes of this study, the hotel located within the 65 to 70 CNEL noise contours complies with indoor noise reduction standards; therefore, it is not considered a noise-sensitive site. There are no other residential land uses or sites within the noise contours.

CNEL = Community Noise Level Equivalent

Source: Adapted from the best available data: California Department of Social Services, 2011; Alameda County, 2011; Cal-Atlas, 2011.

Comparison of the No Action Alternative, Proposed Action, and Project Alternative A

Under both future years considered in this EA, when compared to the No Action Alternative, neither the Proposed Action nor Project Alternative A cause noise-sensitive areas located at or above 65 dB CNEL to experience a noise increase of at least CNEL 1.5 dB because there would be no change in the number and type of operations as a result of the Proposed Action or Project Alternative A. Therefore, neither the Proposed Action nor Project Alternative A would result in a significant noise impact.

4.2.5 CONSTRUCTION IMPACTS

Construction activities for both the Proposed Action and Project Alternative A would temporarily increase ambient noise levels in the immediate vicinity of the construction and land-clearing activities. Grading and scraping operations are the noisiest, with such equipment generating noise levels as high as 70 dBA to 95 dBA within 50 feet of their operation. Existing noise levels from aircraft operations exceed these construction equipment noise levels, and distance rapidly attenuates noise levels. The nearest noise-sensitive receiver is approximately 550 feet from the construction activity.

As indicated in **Section 3.2.4.1** of this document, the City of Oakland has noise standards applicable to noise from construction activity. Noise generated during the construction period would be less than the City of Oakland noise standards at the nearest noise-sensitive receivers. In addition, noise generated during the construction period would be temporary and intermittent and would not be significant in view of the existing noise from aircraft operations. Construction equipment would be maintained to meet manufacturers' operating specifications. Any potential noise impacts associated with the delivery of construction materials would not be significant because contractors would use designated haul routes, including Interstate 880 and connecting arterials to minimize impacts to residential and other noise-sensitive receptors.

4.3 COMPATIBLE LAND USE

4.3.1 OVERVIEW OF IMPACTS

No incompatible land uses have been identified under the Proposed Action or Project Alternative A for 2015 and 2020. Therefore, no significant impacts would occur as a result of any of the three alternatives.

As detailed in FAA Order 1050.1E, the compatible land use section of EAs for airport actions must include documentation to support the required airport sponsor's assurance, under Section 511(a)(5) of the Airport and Airway Improvement Act of 1982 (49 United States Code [USC] 47107[a][10]), that appropriate action within the authority of OAK, including the encouragement of the adoption of zoning laws, has been or will be taken, to the extent reasonable, to promote community land use compatibility adjacent to or in the immediate vicinity of the Airport. The land use compatibility assurance letter, dated October 11, 2011, is provided in **Appendix G** of this EA.

4.3.2 METHODOLOGY

As discussed in FAA Order 1050.1E, Appendix A, Section 4, the compatibility of existing and planned land use in the vicinity of airports is associated with the extent of the airport's future noise impacts. If the

noise analysis conducted in support of a project concludes that there are no significant impacts, the same conclusion can generally be drawn regarding the compatibility of land use in the areas around the Airport. Alternately, where the noise analysis indicates that significant impacts would occur to noise-sensitive land uses in areas exposed to CNEL 65 dB or higher, then impacts on compatible land use must be addressed. To determine if projected noise levels would be incompatible with existing or planned land uses, land uses were identified and mapped in a Geographic Information System (GIS) database developed from information obtained from Alameda County and updated (as necessary) for this EA through aerial photographic interpretation and ground-truthing (i.e., windshield surveys). The noise exposure analyses conducted for this EA (see **Section 4.2**) included identifying and determining noise impacts for noise-sensitive areas that would be exposed to noise levels of yearly day-night average sound level 65 dB or higher. Noise-sensitive land uses typically include residential, educational, health, religious, certain parks and recreational, and cultural (including historical). Areas within the CNEL 65 or higher noise exposure contours were evaluated to determine their compatibility with such levels of noise. The impacts to those sites are discussed in this section of the EA, with cross-references to **Section 4.2.4 Operation Impacts**, as appropriate.

4.3.3 THRESHOLDS OF SIGNIFICANCE

As discussed in **Section 4.2.3**, a proposed action would be considered to have a significant impact on a noise-sensitive use, when compared to the No Action Alternative for the same time frame, if it would cause:

- Noise-sensitive areas exposed to CNEL 65 dB or higher to experience a noise increase of at least CNEL 1.5 dB; or
- An increase of CNEL 1.5 dB that introduces new noise-sensitive areas to exposure levels of CNEL 65 dB or more.

Table 4.3-1 shows the Federal Land Use Compatibility Guidelines included under 14 Code of Federal Regulations (CFR) Part 150, *Airport Noise Compatibility Planning*, which establish noise criteria for various types of land uses. Under the federal guidelines, residential uses and schools are incompatible with noise levels of CNEL 65 dB. Other noise-sensitive facilities, such as churches and convalescent hospitals, are considered compatible within the CNEL 65 dB contour if noise attenuation can be added to the design of the building that would result in a noise level reduction of 25 dB.

The Alameda County Airport Land Use Policy Plan, referenced in **Section 3.3.2**, includes noise compatibility criteria for a variety of land uses that may be affected by noise produced by operations at the Airport. Residential uses, as well as the types of noise-sensitive land uses identified in **Chapter 3** (i.e., schools, libraries, convalescent hospitals, and churches), are compatible with noise levels up to CNEL 65 dB. In areas exposed to noise levels between CNEL 65 dB and CNEL 70 dB, new development of these uses is considered conditionally compatible pursuant to inclusion of noise insulation features that reduce interior noise levels to CNEL 45 dB.

**Table 4.3-1
Land Use Compatibility with Yearly Day-Night Average Sound Levels**

Land Use	Yearly Day-Night Average Sound Level					
	Below 65 Decibels	65-70 Decibels	70-75 Decibels	75-80 Decibels	80-85 Decibels	Over 85 Decibels
Residential						
Residential (Other than mobile homes and transient lodges)	Y	N ¹	N ¹	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodging	Y	N ¹	N ¹	N ¹	N	N
Public Use						
Schools	Y	N ¹	N ¹	N	N	N
Hospitals, Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, Concert Halls	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y ²	Y ³	Y ⁴	Y ⁴
Parking	Y	Y	Y ²	Y ³	Y ⁴	N
Commercial Use						
Offices, Business and Professional	Y	Y	25	30	N	N
Wholesale and Retail Building Materials, Hardware and Farm Equipment	Y	Y	Y ²	Y ³	Y ⁴	N
Retail Trade – General	Y	Y	25	30	N	N
Utilities	Y	Y	Y ²	Y ³	Y ⁴	N
Communications	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, General	Y	Y	Y ²	Y ³	Y ⁴	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (Except Livestock) and Forestry	Y	Y ⁶	Y ⁷	Y ⁸	Y ⁸	Y ⁸
Livestock Farming and Breeding	Y	Y ⁶	Y ⁷	N	N	N
Mining and Fishing, Resource Production and Extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor Sports Arenas, Spectator Sports	Y	Y ⁵	Y ⁵	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits and Zoos	Y	Y	N	N	N	N
Amusement, Parks, Resorts, Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N

**Table 4.3-1
Land Use Compatibility with Yearly Day-Night Average Sound Levels (Continued)**

Notes: The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties remains with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land use for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

Key to Table:

Y (Yes)	Land Use and related structures are compatible without restrictions.
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reductions (outdoor to indoor) are to be achieved through incorporation of noise attenuation into the design and construction of structure.
25,30, or 35 dB	Land use and related structures are generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated in design and construction of structure.

¹ Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction, and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

² Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

³ Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of the buildings where the public are received, office areas, noise-sensitive areas, or where the normal noise level is low.

⁴ Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of the buildings where the public are received, office areas, noise-sensitive areas, or where the normal noise level is low.

⁵ Land use compatible provided special sound reinforcement systems are installed.

⁶ Residential buildings require an NLR of 25 dB.

⁷ Residential buildings require an NLR of 30 dB.

⁸ Residential buildings not permitted.

 Non-compatible land use.

Source: 14 CFR Part 150, Appendix A, Table 1 (January 1, 1998).

4.3.4 OPERATIONAL IMPACTS

The following sections describe impacts on compatible land use that would result from changes in aircraft operations resulting from the proposed alternatives. Impacts are discussed under both 2015 and 2020 conditions.

Year 2015

No Action Alternative

Under the No Action Alternative, the RSA Improvement Project alternatives (Proposed Action and Project Alternative A) would not occur and the noise environment within the GSA would remain unchanged.

Proposed Action and Project Alternative A

The Proposed Action and Project Alternative A are limited to Airport property and would not result in direct changes to existing land uses in the vicinity of the Airport. No incompatible land uses would be exposed to noise levels of CNEL 65 dB under the Proposed Action or Project Alternative A. Therefore, there would be no significant impacts on compatible land use as a result of the Proposed Action or Project Alternative A.

Year 2020**No Action Alternative**

Similar to conditions for 2015, under the No Action Alternative, the RSA Improvement Project alternatives would not occur and the noise environment in the GSA would remain unchanged.

Proposed Action and Project Alternative A

Similar to 2015, the Proposed Action or Project Alternative A for 2020 is limited to Airport property and would not result in direct changes to existing land uses in the vicinity of the Airport. No incompatible land uses would be exposed to noise levels of CNEL 65 dB under the Proposed Action or Project Alternative A. Therefore, no significant impacts on compatible land use would occur as a result of the Proposed Action or Project Alternative A.

4.3.5 CONSTRUCTION IMPACTS**No Action Alternative**

Under the No Action Alternative, the RSA Improvement Project alternatives would not occur and the noise environment in the GSA would remain unchanged.

Proposed Action and Project Alternative A

The temporary potential noise impacts to nearby residents associated with construction activities would not be significant, as described in **Section 4.2.5**. Construction equipment would be maintained to meet manufacturers' operating specifications. Any potential noise impacts associated with the delivery of construction materials would not be significant because contractors would use designated haul routes, including Interstate 880 and connecting arterials to minimize impacts to residential and other noise-sensitive receptors. No other construction-related impacts to compatible land use would occur as a result of the Proposed Action or Project Alternative A.

4.4 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F) AND LAND AND WATER CONSERVATION FUND ACT, SECTION 6(F) RESOURCES**4.4.1 OVERVIEW OF IMPACTS****No Action Alternative, Proposed Action, and Project Alternative A**

The No Action Alternative, Proposed Action, or Project Alternative A would not result in impacts on Section 4(f) resources due to direct or constructive use. Under the No Action Alternative, the OAK RSA Improvement Project would not be implemented and no construction would occur. Under the Proposed Action or Project Alternative A, there would be no direct use of existing park properties, other Section 4(f) resources, or Section 6(f) resources. None of the existing park facilities in the GSA have or require a quiet setting, nor would they be significantly affected by the insignificant changes in the noise environment associated with the OAK RSA Improvement Project alternatives. Therefore, no significant direct or indirect impacts on Section 4(f) or Section 6(f) resources would occur.

4.4.2 METHODOLOGY

Direct impacts were determined to occur if acquisition or physical development of Section 4(f) or Section 6(f) resources would result from the proposed RSA Improvement Project alternatives. Indirect impacts (i.e., constructive use) of Section 4(f) resources were determined by evaluating the projected noise effects that could substantially impair or diminish the activities, features, or attributes of Section 4(f) resources.

4.4.3 THRESHOLDS OF SIGNIFICANCE

FAA Order 1050.1E, Appendix A, Paragraph 6.3 states that a significant impact would occur when a proposed action either involves more than a minimal physical use of a Section 4(f) property or is deemed a “constructive use” substantially impairing the Section 4(f) property, and mitigation measures do not eliminate or reduce the effects of the use below the thresholds of significance. Substantial impairment occurs when significant impacts are sufficiently serious that the value of the site in terms of its prior significance and enjoyment are substantially reduced or lost due to a proposed project, and therefore:

- A direct impact would constitute actual use of a Section 4(f) resource, including land acquisition and/or physical development of a Section 4(f) resource as a result of a project, or
- Constructive use of a Section 4(f) resource would occur where a property identified as having a quiet setting as a recognized feature or attribute would result in a significant indirect impact (i.e., noise) as a result of the project.

4.4.4 OPERATIONAL IMPACTS

No Action Alternative

Under the No Action Alternative, the OAK RSA Improvement Project would not be implemented at OAK. Therefore, no impacts on Section 4(f) or Section 6(f) resources would occur.

Proposed Action and Project Alternative A

Implementation of the Proposed Action or Project Alternative A would not directly impact the parks and recreation areas identified in **Section 3.4**, or result in an increase in patronage of these areas. The Proposed Action would not require the acquisition or actual use of property in the surrounding parks and recreation areas; therefore, no direct impact would occur. Further, there are no parks or open spaces that would be exposed to a change in noise at or above CNEL 65 dBA in both 2015 and 2020 as a result of implementing the Proposed Action or Project Alternative A. Therefore, no Section 4(f) or Section 6(f) resources within the GSA would be impacted by the Proposed Action or Project Alternative A during the operation phase.

4.4.5 CONSTRUCTION IMPACTS

The temporary potential noise impacts to nearby residents associated with construction activities would not be significant, as described in **Section 4.2.5**. Construction-related noise would be temporary in

nature, and no long-term indirect impacts on Section 4(f) or Section 6(f) resources would occur under the Proposed Action or Project Alternative A.

4.5 SOCIOECONOMIC AND SECONDARY INDUCED IMPACTS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISK

4.5.1 OVERVIEW OF IMPACTS

Neither the Proposed Action nor Project Alternative A would result in disruption of established communities, or disruption of orderly planned development. No development would occur outside of OAK property. Therefore, no significant direct or indirect impacts are anticipated. In addition, neither the Proposed Action nor Project Alternative A would affect roadways operation of level of service within the GSA, or result in a disproportionately high adverse impact on minority and low-income populations or adverse impacts to children's environmental health and safety.

4.5.2 METHODOLOGY

Data were gathered for the GSA to evaluate potential socioeconomic impacts, potential environmental justice areas of concern, and locations where children's environmental health and safety could be compromised. Potential direct and indirect effects of the alternatives were evaluated.

Socioeconomics and Secondary Induced Impacts

Social impacts were determined through the evaluation of the areas affected by the No Action, Proposed Action, or Project Alternative A.

Surface Transportation

The surface transportation/traffic analysis considered future conditions in the GSA to determine if implementation of the RSA Improvement Project alternatives would result in direct or indirect impacts. A direct effect occurs when access to a particular site or area is altered; if additional traffic traveling to or from OAK results; or if additional transportation services are needed. An indirect effect occurs when changes in the planned development of an area result in increased traffic or transportation needs. A review of existing general plans for the area for applicable policies and regulations was also conducted to determine if implementation of the RSA Improvement Project alternatives studied would result in impacts.

Environmental Justice

U.S. Department of Transportation (DOT) Order 5610.2, Executive Order 12898 "*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*" and DOT Executive Order 5610.2 "*Environmental Justice in Minority and Low-Income Populations*" were used to undertake this analysis. Environmental justice impacts were evaluated by determining whether minority or low-income households or minority businesses would be disproportionately affected by the proposed RSA Improvement Project alternatives. A locale is a potential environmental justice area of concern when the minority or low-income population of the analysis area is "meaningfully greater" than that of the analysis area of the county. Additionally, any census tracts (CTs) with a median household income below the

U.S. Department of Housing and Urban Development, Health and Human Services Poverty Guidelines for a family of four in 1990 and 2000 are identified as potential environmental justice areas of concern. The Health and Human Services poverty guidelines for a family of four in 2000 and 2010 were \$17,050 and \$22,050, respectively (U.S. HHS, 2011).

Protection of Children from Environmental Health Risks and Safety Risks

Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks" (April 21, 1997), requires federal agencies to make it a high priority to identify and assess environmental health and safety risks resulting from policies, programs, activities, and standards that may disproportionately affect children. Impacts of the RSA Improvement Project alternatives studied in detail were assessed with regard to compliance with this Order.

4.5.3 THRESHOLDS OF SIGNIFICANCE

Potential socioeconomic and social impacts were evaluated in light of the following factors:

- Extensive relocation of residents and availability of replacement housing;
- Extensive relocation of businesses that would create economic hardship;
- Disruption of local traffic patterns that would reduce level of service on roads in the community; or
- Division or disruption of established communities.

Potential environmental justice impacts were evaluated in light of the following factor:

- Disproportionately high adverse impact on minority and low-income populations may represent a significant impact.

Potential children's environmental health and safety impacts were evaluated in light of the following factors:

- Disproportionate health and safety risks to children may represent a significant impact; and
- Construction impacts.

4.5.4 OPERATIONAL AND CONSTRUCTION IMPACTS

No Action Alternative

The No Action Alternative would not result in socioeconomic, environmental justice, or children's environmental health and safety impacts because no construction would occur.

Proposed Action and Project Alternative A

Socioeconomics and Secondary (Induced) Impacts

The actions associated with the Proposed Action or Project Alternative A would take place entirely on existing Airport property. No residences, businesses, industries, or community facilities/utilities would be acquired or relocated for the Proposed Action. Since the Proposed Action and Project Alternative A are completely on OAK property, no disruption of established communities would occur. Implementation of the Proposed Action or Project Alternative A would have no socioeconomic impacts on the GSA.

Surface Transportation

The minor increase in construction-related traffic during the temporary construction would not cause a significant decrease in the operation or level of service on roadways within the GSA. Sufficient capacity exists regarding transit service, parking, and bicycle/pedestrian facilities that serve OAK and the nearby vicinity to accommodate any increase in construction workers who could potentially use these modes of surface transportation.

The Proposed Action and Project Alternative A are confined to existing OAK property, and would not significantly affect traffic in the GSA, result in a community disruption, or create long-term impacts on local businesses. Access within the GSA would not be altered, nor would additional transportation services be required. As previously explained, the Proposed Action and Project Alternative A are a construction-related action and would not increase the airfield or roadway capacity of OAK. Because no significant influx of people would be attributed to the Proposed Action or Project Alternative A, roadway network changes are not required. Surface transportation/traffic changes are not anticipated to occur within the GSA as a result of the Proposed Action or Project Alternative A. However, roadway average daily traffic changes in the Oakland region would occur regardless of the Proposed Action or Project Alternative A. Therefore, no significant direct or indirect roadway network impacts are anticipated.

Environmental Justice

Environmental justice impacts were evaluated by determining whether minority or low-income households or minority businesses would be affected by the No Action Alternative, the Proposed Action, or Project Alternative A. No CTs within the GSA can be characterized as having a “meaningfully greater” minority or low-income population.

Analysis of noise, traffic, and air quality, as documented in **Sections 4.2, 4.5, and 4.6**, indicates that no significant impacts would occur within the GSA. Because neither the effects of the Proposed Action nor Project Alternative A would pose significant environmental impacts, and no communities where environmental justice would be an issue are within the GSA, no disproportionate impact is anticipated on any low-income or minority populations within the GSA.

The percentage of minority population within CT 4090 is 79 percent. The percentage of the population living below the poverty level within CT 4090 is 24 percent – two times greater than Alameda County’s average (11 percent). Neither the Proposed Action nor the Project Alternative A would result in significant impacts that could adversely affect the identified environmental justice population. The RSA Improvement Project would occur within the Airport property, in the immediate vicinity of the four runways at OAK, and would not result in significant impacts off-airport on the nearby communities, as discussed in the EA under resources such as noise, air quality, and hazardous materials.

Protection of Children from Environmental Health Risks and Safety Risks

Evaluations of disproportionate impacts to children in accordance with Executive Order 13045 are focused on areas where children are present. This analysis noted in particular the location of daycare centers and schools, because these locations had the highest concentrations of children. Twenty-one schools and daycare centers are located in the GSA.

As described in **Section 4.2**, there would be no significant noise impacts from the Proposed Project and therefore no potential for such noise impacts to disproportionately affect children. As described in **Section 4.6**, there would be no significant air quality impacts, and therefore no potential for such air quality impacts to disproportionately affect children. Therefore, implementation of the Proposed Project or Alternative A would not result in a significant or disproportionate health or safety risk to children.

4.6 AIR QUALITY

Two sets of federal guidelines, or requirements, determine the need for, define the type(s) of, and establish the extent of an air quality assessment required for airport-related actions and projects. These include FAA Orders 1050.1E and 5050.4B, and the federal Clean Air Act (CAA), and its implementing regulations found in 40 CFR Parts 51 and 93. Guidelines for preparing an air quality analysis under the National Environmental Policy Act (NEPA) are also contained in the FAA's *Air Quality Procedures for Civilian Airports and Air Force Bases* (FAA, 1997 and 2004b), referred to as the "FAA's Air Quality Handbook and its Addendum." The requirements in all of these documents were followed in preparing the air quality assessment for the RSA Improvement Project at OAK.

FAA Order 1050.1E states that an air quality assessment prepared under NEPA should include an analysis and conclusions of a Proposed Action's impacts on air quality; and further directs that, when a NEPA analysis is needed, the Proposed Action should be assessed by evaluating the effects on the National Ambient Air Quality Standards (NAAQS). FAA Order 5050.4B further provides that, for NEPA purposes, environmental analyses must determine if the air quality impacts of any reasonable alternative would exceed the NAAQS for the time periods analyzed. For General Conformity requirements under the Section 176 (c) of CAA, only the proposed or preferred alternative need be analyzed.

The Section 176 (c) of CAA require federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP). Conformity is defined as demonstrating that a project or action conforms to the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS, and achieving expeditious attainment of such standards. Federally funded and approved actions at airports are subject to the U.S. Environmental Protection Agency's (U.S. EPA) "General Conformity" regulations. A conformity determination of the Proposed Action is required if the total direct and indirect pollutant emissions resulting from a project are above *de minimis* emissions threshold levels specified in the conformity regulations.

4.6.1 OVERVIEW OF IMPACTS

In accordance with FAA Order 5050.4B, because the number of aircraft operations at OAK and the aircraft fleet mix serving OAK would not change as a result of the Proposed Action or Project Alternative A, an operational emissions inventory was not prepared, and is not required under NEPA.

However, a construction emissions inventory is required to address construction activities associated with the Proposed Action and Project Alternative A. Air emissions associated with construction activities consist of carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter equal to or less than 10 microns in diameter (PM₁₀) and particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}), sulfur dioxide, and volatile organic compounds (VOCs). For the Proposed Action and Project

Alternative A, the construction emissions would be below the established General Conformity *de minimis* thresholds for all applicable pollutants and construction years. Thus, the Proposed Action and Project Alternative A conform to the General Conformity requirements of the CAA.

4.6.2 METHODOLOGY

Activity levels for on-road construction vehicles were developed based on requirements and schedules developed for the Proposed Action and Project Alternative A. On-road emission factors were computed using region-specific data developed by the California Air Resources Board (CARB) EMFAC2007 emissions model (CARB, 2006a). A schedule of planned construction activities for the Proposed Action and Project Alternative A, including vehicle miles traveled and idling time estimates for on-road construction vehicles, was developed by construction activity. Criteria pollutant emissions associated with these activities were computed by factoring these data against Bay Area-specific emissions factors (in grams per mile and grams per idle hour) within EMFAC2007.

Construction equipment and fuel type, estimated horsepower, and estimated annual hours of operation required for the construction activities were also developed. The annual hours of operation were based on the material use and production rates, generally as a result of an 8-hour day and 5-day workweek. Non-road exhaust emission factors were calculated using the CARB OFFROAD2007 emissions model (CARB, 2006b). This information was applied to criteria pollutant emissions factors, in grams per horsepower-hour, primarily derived using the OFFROAD2007 model. Notably, because CARB was revisiting some information contained in the OFFROAD2007 model and had issued a draft database of updates for select diesel equipment (i.e., the Off-road Emissions Inventory Database), the OFFROAD2007 emissions information was appended with the Off-road Emissions Inventory Database information where necessary and applicable.

Based on the CARB URBEMIS2007 (Version 9.2.4) emissions model (CARB, 2007), the average commute distance for construction employees was set to 9.5 miles (19 miles round trip). Additionally, based on the URBEMIS (Urban Emissions software) model default data, 1.25 employees per piece of construction equipment are assumed to access the site daily. Accordingly, the equipment quantities in the construction schedule were factored by 1.25 to estimate the number of employees, and by 19 miles per employee per day to estimate employee vehicle miles traveled.

Fugitive dust emissions occur as the result of travel on unpaved roads, site preparation, grading activities, wind erosion, and other land disturbances. URBEMIS provides a worst-case uncontrolled PM₁₀ emissions rate of 38.2 pounds per acre-day. This emissions rate was used to calculate uncontrolled PM₁₀ emissions using construction task acreage assumptions, as well as construction task durations. Notably, the CARB specifies in the URBEMIS emissions model that a maximum of 25 percent of this acreage would be disturbed on any given construction day, and that 20 percent of the PM₁₀ emissions would occur as PM_{2.5}. Lastly, CARB recommends, in the URBEMIS, a 61 percent emissions control efficiency (i.e., 61 percent of the unmitigated emissions would be eliminated) for fugitive dust estimates, which reflect Bay Area Air Quality Management District (BAAQMD) basic mitigation measures.

Based on CARB default data in URBEMIS, an emission factor of 2.62 pounds of VOC (from asphalt curing) per acre of asphalt material was used to determine VOC emissions from asphalt paving. The

construction schedule provided the required tons of bituminous surface material. Equivalent acreage was calculated using a weight of asphalt of 2,111 tons per acre, assuming an 8-inch pavement depth, based on data available from the National Asphalt Pavement Association and FAA Advisory Circular (AC) 150/5320-6E: *Airport Pavement Design and Evaluation* (FAA, 2009a).

4.6.3 THRESHOLDS OF SIGNIFICANCE

The U.S. EPA first promulgated the General Conformity Rule in 1993 to implement the conformity provision of Title I, Section 176(c)(1) of the CAA. Section 176(c)(1) requires that the federal government not engage in, support, or provide financial assistance for licensing, permitting, or approving any activity not conforming to an approved CAA implementation plan. The approved implementation plan could be a Federal Implementation Plan, SIP, or Tribal Implementation Plan.

The General Conformity Rule is designed to ensure that air emissions associated with federal actions do not contribute to air quality degradation or prevent achievement of state and federal air quality goals. In short, General Conformity refers to the process of evaluating federal plans, programs, and projects to determine and demonstrate that they meet the requirements of the CAA and applicable SIP.

Compliance with the General Conformity Rule is based on a comparison of the changes in air emissions (Proposed Action minus the No Action Alternative) with the *de minimis* thresholds¹, in accordance with FAA Order 1050.1E. In the Bay Area, with respect to ozone, the *de minimis* thresholds are 100 tons/year of VOCs and 100 tons/year of NO_x, the two primary precursors to ozone formation. The *de minimis* threshold for CO and PM_{2.5} is also 100 tons/year. There is no applicable *de minimis* threshold for PM₁₀ because the Bay Area is considered in attainment with the NAAQS for this pollutant.

The greenhouse gas (GHG) analysis is based on the FAA's *Considering Greenhouse Gases and Climate under the NEPA* (FAA, 2012b), which provides guidance on the consideration and evaluation of GHG for airport actions, and the Draft *NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions* (CEQ, 2010), which considers qualitative and quantitative assessment for projects that result in GHG emissions in excess of 25,000 metric tons.

4.6.4 OPERATIONAL IMPACTS

In accordance with FAA Order 5050.4B, because the number of aircraft operations at OAK and the aircraft fleet mix serving OAK would not change as a result of the Proposed Action or Project Alternative A, operational emissions inventories were not prepared and are not required under NEPA.

4.6.5 CONSTRUCTION IMPACTS

No Action Alternative

Under the federal guidelines, the No Action Alternative represents the existing condition to which the Proposed Action and Project Alternative A are compared. No construction activities would be associated with the No Action Alternative. Therefore, no emissions inventory is required for the No Action Alternative.

¹ U.S. EPA, General Conformity - *De Minimis* Levels, <http://www.epa.gov/air/genconform/deminimis.html>.

Proposed Action and Project Alternative A

Air emissions occurring as the result of construction activity vary based on the project's duration and level of activity. Construction emissions occur mostly as exhaust products from the operation of construction equipment and vehicles, but can also occur as fugitive dust emissions from land disturbance during material staging, demolition, and movement. Evaporative emissions also result from asphalt paving operations. The type of construction equipment commonly used can be categorized as both off-road and on-road equipment. Off-road equipment is typically used for earthwork, paving, demolition, and other on-site activities, while on-road equipment is typically used to transport and deliver supplies, materials, and employees.

The Proposed Action and Project Alternative A involve the same construction elements, with the exception of the relocation of a small vehicle service road at the western end of Runway 11-29. The total amount of construction activity for the Proposed Action or Project Alternative A differs very little. Therefore, the emissions inventory described in this section and the discussion of GHGs are considered to be equally applicable to both alternatives.

Emissions Inventory

Construction activities are expected to occur from 2013 through 2015 in connection with the Proposed Action or Project Alternative A, and the emissions inventory for this project-related activity is summarized in **Table 4.6-1**. As shown, the worst-case construction year would be 2013, in which 4.2 tons of CO, 0.7 ton of VOC, 5.8 tons of NO_x, 13.6 tons of PM₁₀, and 3.0 tons of PM_{2.5} are estimated to be emitted. These construction-related pollutant emissions are compared against the applicable General Conformity *de minimis* thresholds established for the Bay Area to gauge conformance to the SIP.

**Table 4.6-1
Construction Emissions Inventory**

Construction Year	Estimated Annual Emissions (tons/year)				
	CO	VOC	NO _x	PM ₁₀	PM _{2.5}
2013	4.21	0.66	5.82	13.6	3.01
2014	2.34	0.36	3.10	1.49	0.40
2015	2.65	0.46	3.61	2.07	0.54
Maximum	4.21	0.66	5.82	13.6	3.01
General Conformity Threshold	100	100	100	NA	100
Significant?	No	No	No	No	No

Notes:

CO = carbon monoxide

NA = Not Applicable (The Bay Area is in attainment with the NAAQS for PM₁₀)

NO_x = oxides of nitrogen

PM₁₀ = particulate matter equal to or less than 10 microns in diameter

PM_{2.5} = particulate matter equal to or less than 2.5 microns in diameter

VOC = volatile organic compound

Source: KB Environmental, 2011

Comparison with General Conformity Standards

As shown in **Table 4.6-1**, the construction-related emissions of CO, VOC, NO_x, and PM_{2.5} would be below the established General Conformity *de minimis* thresholds of 100 tons per year for all construction years. There are no applicable General Conformity thresholds for PM₁₀ because the Bay Area is in attainment for this pollutant; thus, the Proposed Action or Project Alternative A would conform to the SIP, and neither is expected to cause or contribute to an exceedance of the NAAQS. As a result, a formal General Conformity determination is not required for either the Proposed Action or for Project Alternative A.

Greenhouse Gas Emissions and Climate Change

Based on FAA data aircraft, operations at OAK account for less than 0.7 percent of the total U.S. commercial aviation activity.² Therefore, assuming that GHGs occur in proportion to the level of activity, GHG emissions associated with existing and future aviation activity at OAK would be expected to represent less than 0.7 percent of U.S.-based GHG emissions.

Although there are no federal standards for aviation-related GHG emissions, it is well established that GHG emissions can affect climate.³ The Council on Environmental Quality has indicated that climate should be considered in NEPA analyses. As noted by the Council on Environmental Quality, however, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand" (CEQ, 2010).

As noted previously, the number of aircraft operations at, and the aircraft fleet mix serving, OAK would not change as a result of the Proposed Action or Alternative A. The RSA alternatives would not result in an increase in GHG emissions directly associated with the Proposed Action or Alternative A in excess of 25,000 metric tons, which is a factor when considering more detailed analysis under draft NEPA guidelines (CEQ, 2010). Therefore, the GHG emissions associated with the Proposed Action or Alternative A would not be significant. Construction activities associated with implementation of the RSA alternatives would result in *de minimis* air quality impacts.

The cumulative impact of this Proposed Action or Alternative A on the global climate when added to other past, present, and reasonably foreseeable future actions is not currently scientifically predictable. Aviation has been calculated to contribute approximately 3 percent of global carbon dioxide (CO₂) emissions; this contribution may grow to 5 percent by 2050. Actions are underway within the U.S. and by other nations to reduce aviation's contribution through such measures as new aircraft technologies to reduce emissions and improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market-based measures and environmental regulations including an aircraft CO₂ standard. The U.S. has ambitious goals to achieve carbon-neutral growth for aviation by 2020 compared to a 2005 baseline, and to gain absolute reductions in GHG emissions by 2050. At present, there are no calculations of the extent to which measures individually or cumulatively may affect aviation's CO₂ emissions. Moreover, there are large uncertainties regarding aviation's impact on climate.

² In 2010, the FAA Air Traffic Activity Data System reported 28,365,430 total towered aircraft operations in the United States. OAK accounted for 219,650 aircraft operations, or 0.7 percent of the total aircraft operations at towered airports in the United States.

³ See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, U.S. EPA, and the U.S. Department of Energy), has developed the Aviation Climate Change Research Initiative in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions, with quantified uncertainties for current and projected aviation scenarios under changing atmospheric conditions (Brown, et al., 2010).

4.6.6 MITIGATION

Avoidance and Minimization Measures

Air quality impacts resulting from the OAK RSA Improvement Project would be related to construction activities associated with implementation of the Proposed Action or Project Alternative A, and are expected to be short-term and minimal. Project impacts would not exceed the General Conformity thresholds. Nevertheless, construction-related emissions associated with the Proposed Action or Project Alternative A could be further reduced by implementing the following avoidance and minimization measures identified by BAAQMD to address both fugitive dust and combustion emissions:

- Contractor would demonstrate compliance with CARB's off-road regulations.
- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved vehicle service roads) would be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site would be covered.
- All visible mud or dirt track-out onto adjacent public roads would be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads would be limited to 15 miles per hour.
- Idling times would be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, Title 13, Section 2485 of the California Code of Regulations). Clear signage would be provided for construction workers at all access points.
- All construction equipment would be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment would be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A sign visible to the public would be posted with the telephone number and contact person at the Lead Agency for dust complaints. This person would respond and take corrective action within 48 hours. The BAAQMD's telephone number would also be visible to ensure compliance with applicable regulations.
- All excavation, grading, and/or demolition activities would be suspended when average wind speeds exceed 20 miles per hour.

- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities in the same area at any one time would be limited. Activities would be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, would be washed off prior to leaving the site.

4.7 WATER RESOURCES

4.7.1 OVERVIEW OF IMPACTS

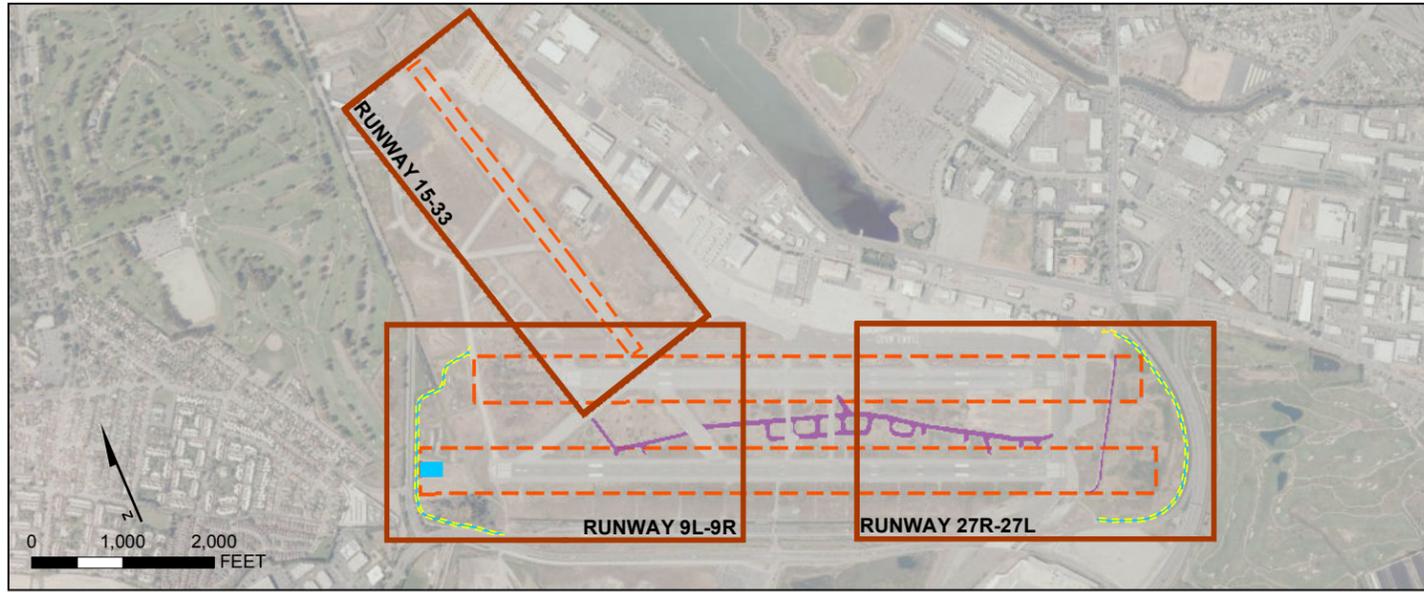
The No Action Alternative would not involve construction of the Proposed Action or Project Alternative A and would not result in impacts (direct or indirect) to water resources. Overall, there would be no substantial change in stormwater discharges associated with the Proposed Action or Project Alternative A, because existing impervious pavement would be removed to offset additional impervious surfaces, resulting in an overall net reduction in impervious surfaces of approximately 1 acre. Existing grades and drainage patterns would remain approximately the same, and no new sources of pollutants would be introduced (see **Figure 4.7-1**).

Implementation of the Proposed Action or Project Alternative A would include best management practices (BMPs) and avoidance and minimization measures that would maintain water quality throughout the construction phases. These BMPs and avoidance and minimization measures include project-specific design measures, a dewatering management plan, and a stormwater pollution prevention plan (SWPPP). With the implementation of these measures, the Proposed Action or Project Alternative A would not result in significant impact to water quality. As noted in **Section 2.5**, the Proposed Action or Project Alternative A would not require driving new piles in the San Francisco Bay. Therefore, neither the Proposed Action nor the Project Alternative A would impact waters in the San Francisco Bay.

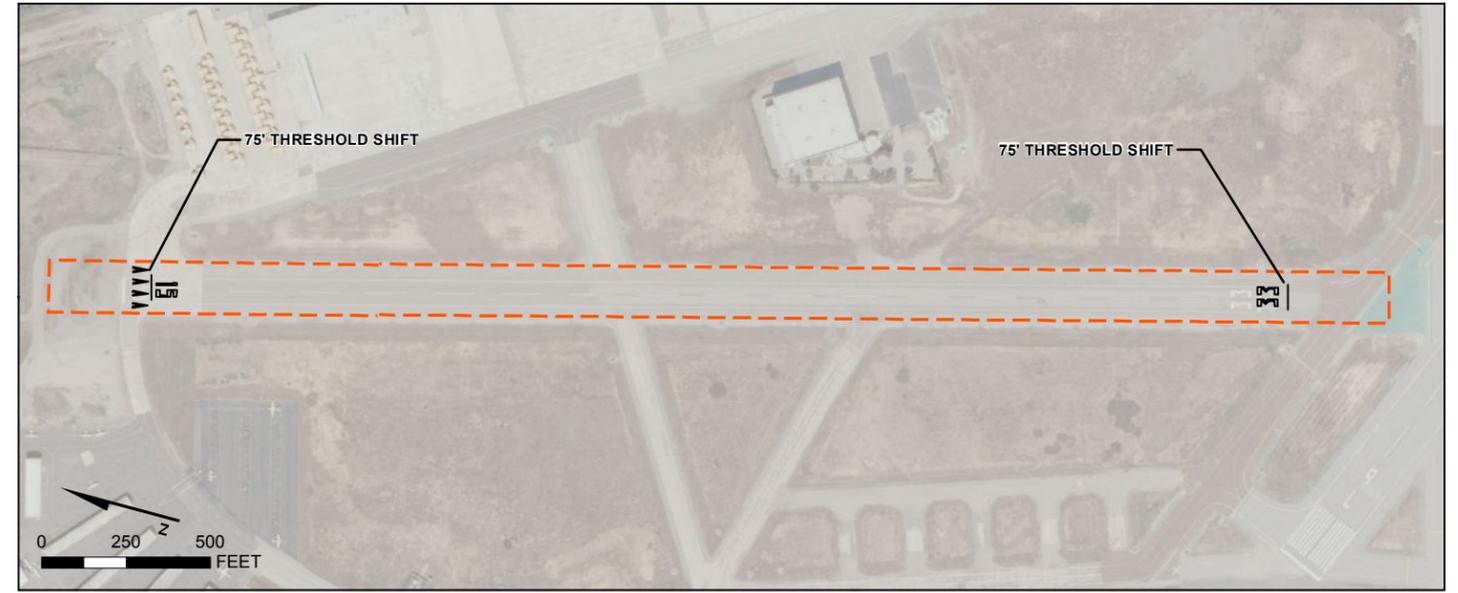
After construction, stormwater management and monitoring would continue to be performed in accordance with the Airports Group Monitoring Program under the National Pollutant Discharge Elimination System (NPDES) General Industrial Permit. Additional avoidance and minimization measures, including post construction BMPs, would be implemented to ensure that stormwater is treated to at least pre-project levels. In addition, demand for potable water or wastewater treatment would not differ from the No Action Alternative.

4.7.2 METHODOLOGY

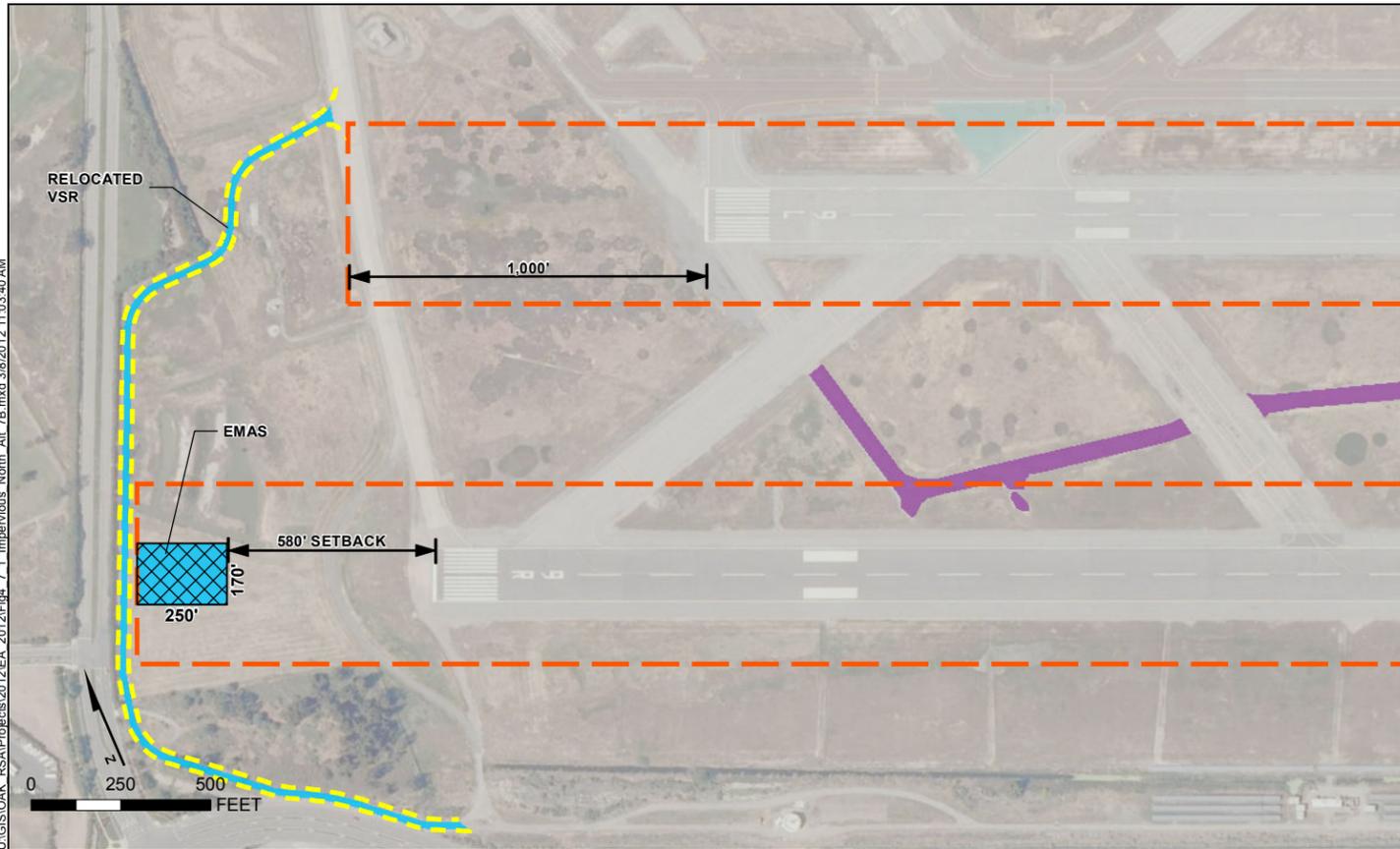
Federal and state statutes regulating water resources were reviewed for the analysis of potential water quality impacts. The federal Clean Water Act (CWA) includes Section 401 – Clean Water Quality Certification, Section 402 – NPDES Program, and Section 404 – Permit for Fill Material in Waters and Wetlands. Under the state's Porter-Cologne Water Quality Act, the Regional Water Quality Control Boards (RWQCBs) are responsible for implementing the CWA and developing basin plans (such as the San Francisco Basin Plan) that designate beneficial uses of California's major rivers and groundwater basins, and establish water quality objectives for those waters. The applicable statutes establish water quality standards, control discharges and pollution sources, protect drinking water systems, prevent/minimize the loss of wetlands, and protect aquifers and other sensitive ecological areas.



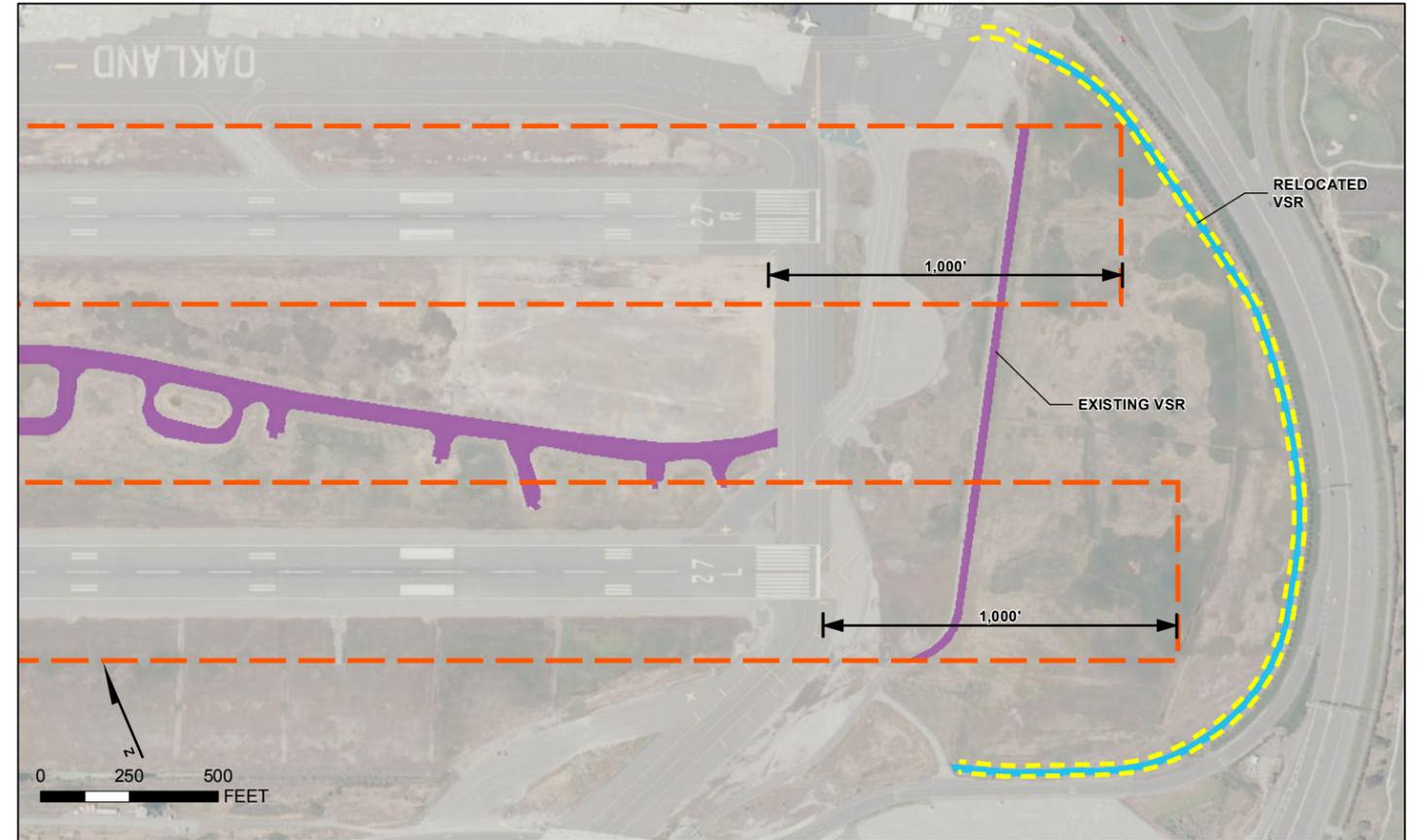
OVERVIEW



RUNWAY 15-33



RUNWAY 9L-9R



RUNWAY 27R-27L

- Roadway
- Runway Safety Area
- Impervious Surface to be Removed
- New Impervious Surface
- EMAS

**PROPOSED ACTION AND PROJECT ALTERNATIVE A-
NORTH FIELD IMPROVEMENTS
WITH CHANGES TO IMPERVIOUS SURFACES**

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Oakland International Airport
Oakland, California

Documents previously prepared for OAK, including the Proposed Airport Development Program Environmental Impact Report (Port of Oakland, 1997), Aviation Facilities Complex Storm Water Pollution Prevention Plan (Port of Oakland, 2008), Stormwater Infrastructure Management Plan Field Site Visit Technical Memorandum (Kimley Horn, 2009a), the Stormwater Management Implementation Plan (Kimley Horn, 2009b), and the Group Stormwater Monitoring Program and Annual Report (Port of Oakland, 2011a and 2011b), were used to identify existing conditions and determine whether water quality, water resources, and existing stormwater infrastructure would be impacted by the RSA Improvement Project. The existing City of Oakland General Plan (City of Oakland, 1998) was also reviewed for applicable policies and regulations to determine whether implementation of the alternatives studied would result in potential impacts to water resources. Existing impervious areas and locations where disturbance is proposed were evaluated to determine potential direct and indirect impacts to groundwater and surface water resources. Potential impacts to groundwater recharge/detention areas were reviewed using local geologic and hydrologic maps. Documentation of soil and groundwater contamination in the vicinity of OAK was also reviewed to assess areas of concern. **Section 4.15** addresses potential soil and groundwater contamination (i.e., hazardous materials) in the DSA.

The potential impacts to water quality were assessed based on the location, preliminary design plans, and intended function of the Proposed Action and Project Alternative A. For comparative purposes, the effects of the No Action Alternative were also evaluated. Additional discussion relating to impacts on water quality associated with changes to existing wetland areas on the Airport is provided in **Section 4.9**.

Increases in potable water consumption and domestic wastewater treatment production were also considered in regard to potential direct impacts or changes in operational activities.

4.7.3 THRESHOLDS OF SIGNIFICANCE

In accordance with FAA Order 1050.1E (FAA, 2006a), an action would be considered to have a significant impact if it would result in the potential to exceed water quality standards; if there are water quality problems that cannot be avoided or satisfactorily mitigated; or there would be difficulty in obtaining a permit or authorization.

4.7.4 OPERATIONAL IMPACTS

No Action Alternative

Under the No Action Alternative, construction of the RSA Improvement Project would not occur, and operational activities would not be altered; therefore, no impacts to water quality or water resources are anticipated.

Surface Water Quality

Under the No Action Alternative, the impervious area within Airport property would not change. No additional potential sources of pollution would be introduced (no new operations or facilities would introduce new pollutants to the Airport). Because the No Action Alternative would not alter operational activities, stormwater would continue to be managed in accordance with the State Water Resources Control Board's (SWRCB) Water Quality Order No. 97-03-DWQ, NPDES General Permit No. CA

S000001, and other federal, state, and local water quality regulations. The No Action Alternative would not alter operational activities at OAK, and therefore, no impacts to surface water quality impacts would occur.

Groundwater

The No Action Alternative would not change operational activities at OAK, and therefore, no impacts to groundwater resources would occur.

Potable Water

The No Action Alternative would not change activity or the number of passengers at OAK, and therefore would not increase water consumption or impact potable water demand at OAK.

Wastewater

The No Action Alternative would not change activity or the number of passengers at OAK, and therefore would not impact local wastewater collection or treatment systems.

Proposed Action

Under the Proposed Action, the RSAs for Runways 9L-27R and 9R-27L would be extended to the west, which would involve filling a portion of the existing non-tidal waters of the U.S., rerouting the vehicle service road near the approach to Runway 9R, and grading. Runway 9R-27L would have an Engineered Materials Arresting System (EMAS) bed approximately 250 feet long by 170 feet wide that would be set back from the landing threshold of Runway 9R by approximately 580 feet. The RSA between the western edge of Runway 9R and the EMAS would be graded but not paved, and would therefore remain a pervious surface. On the eastern end of North Field, the vehicle service road in the approaches to and between Runways 27L and 27R would be rerouted, and portions of the existing non-tidal wetlands would be filled, graded, and paved to bring the RSAs into compliance with FAA airport design standards. The existing runway locations and lengths on North Field would be maintained.

Runway 11-29 would be shifted 520 feet to the west when aircraft are departing to the east on Runway 11, and taxiways providing access to the new and existing ends of Runway 11-29 would be added and modified. Additionally, the new Glide Slope Critical Area would be graded, which would fill the low-lying areas that currently pond, but remain pervious.

Under the Proposed Action, utilities would be relocated and drainage improvements would be implemented. Avoidance and minimization measures would be incorporated into the design. Specifically, grading would be designed to direct drainage to new and existing infrastructure and avoid concentration of flows and increased flow velocities, and thereby minimize the potential for erosion. Drainage improvements would include new catch basins, underground pipe, and swales, and would be designed to capture stormwater runoff where minor changes to drainage patterns would occur, directing the discharge away from low-lying areas. Soil treatment would be designed to reduce erosion and settlement. Ongoing inspection and maintenance of the drainage system would be part of long-term operations.

Surface Water Quantity and Quality

As described in **Section 4.9.1**, the Proposed Action has been revised to reduce the impacts to wetlands and waters of the U.S. Revisions to the Proposed Action also apply to the Project Alternative A. Therefore, impacts associated with surface water quality and quantity and filling of wetlands and waters of the U.S. would be the same for both project alternatives. Non-tidal wetlands that are located in the Pump House No. 4 drainage area on the eastern end of Runways 9L-27R and 9R-27L would be filled. Currently, these wetlands retain stormwater runoff from the area immediately surrounding the wetlands. Stormwater runoff from the existing runways is not directed into or treated by these wetlands. The existing stormwater drainage system associated with the eastern portions of Runways 9L-27R and 9R-27L collects and conveys stormwater runoff to either Pump House No. 1 or Pump House No. 6.

As shown in **Table 4.7-1** and on **Figure 4.9-2 in Section 4.9**, approximately 4.28 acres of the non-tidal wetlands would be filled, thereby eliminating a relatively small amount of storage. The small amount of additional runoff, due to filling the wetlands, would flow directly to the detention basin at Pump House No. 4 where sediments and potential pollutants conveyed by the stormwater would be allowed to settle, similar to existing operations. In addition, there would be a small net increase in impervious surface area of approximately 1.1 acres, or approximately 0.3 percent of the total drainage area (1.1 acres, compared to 394 acres).

Table 4.7-1
Amount of Area Permanently Disturbed by Proposed Action and Project Alternative A

Pump House	Total Drainage Area (acres) ¹	Amount of Impervious Surface Area to be removed (acres)	Amount of Impervious Surface Area to be added (acres)	Net Amount of Impervious Surface Area to be added (acres)	Percent of Total Drainage Area (percent)	Non-Tidal Wetlands and Non-Tidal Waters to Be Impacted (acres)
Pump House No. 1	225	8.5	0.04	-8.5	-4	0
Pump House No. 2	466	1.1	1.3	0.2	<0.1	0.51 ²
Pump House No. 4	394	0.2	1.3	1.1	0.3	4.28 ³
Pump House No. 6	1,261	0	5.9	5.9	0.5	9.76 ^{4, 5}
Total	2,346	9.8	8.5	-1.3	<0.1	14.56 ⁶

Notes:

1. Pump house drainage areas are from Kimley-Horn, 2009b. See **Figure 3.7-1**.
2. Represents impacted non-tidal waters west of Runway 9R-27L. See **Figures 4.7-2** and **4.9-1**.
3. Represents impacted non-tidal wetlands east of Runway 9R-27L. See **Figures 4.7-2** and **4.9-2**.
4. Represents non-tidal wetlands and waters in South Field. See **Figures 4.9-3** through **4.9-6**.
5. For Project Alternative A, an additional 5 feet of runway pavement would be included at the west end of Runway 11-29. This would add approximately 0.06 acre of impervious surface area to Pump House No. 6 drainage area.
6. Total may not match details because of rounding.

In addition, a portion of the non-tidal waters of the U.S. at the northwestern end of Runway 9R-27L would be filled. Currently, these non-tidal waters, which are shown to be located in the Pump House No. 2

drainage area, connect to the adjacent property via an existing culvert. These non-tidal waters of the U.S. generally contain standing water throughout the year (Kimley Horn, 2009b). Implementation of the Proposed Action would include partial filling of the ponds and regrading to improve drainage conditions. As shown in **Table 4.7-1**, the net increase in impervious surface area added to the Pump House No. 2 drainage area would be 0.2 acre (less than 0.1 percent of the Pump House No. 2 drainage area), and the loss of storage from filling the non-tidal waters of the U.S. would be extremely small compared to the total stormwater runoff within the drainage basin of Pump House No. 2.

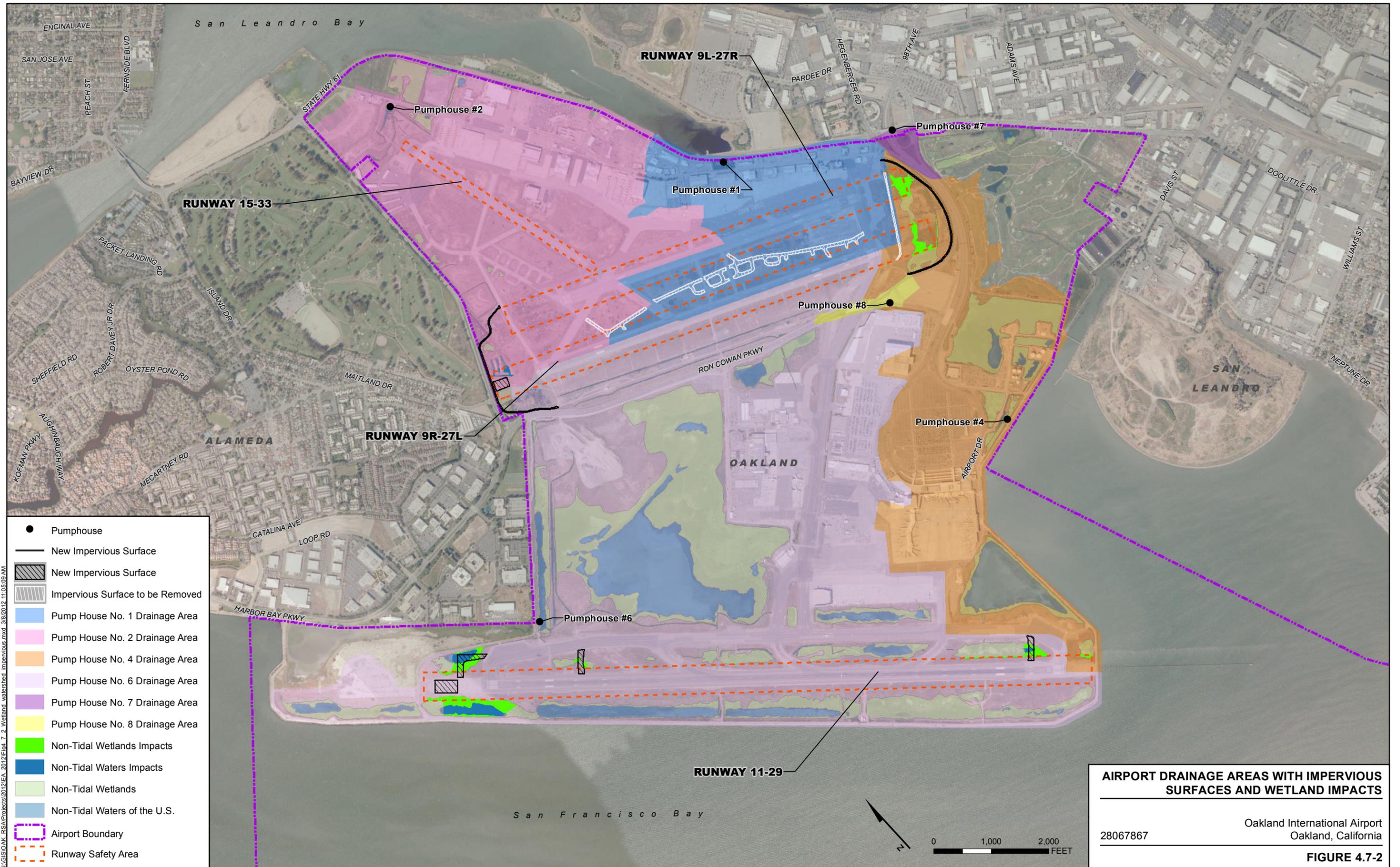
In South Field, modifications at the western end of Runway 11-29 would include grading, filling, and installing new impervious surface at Runway 11, all located in the Pump House No. 6 drainage area. The area west of Runway 11-29 would be graded to lengthen the RSA, and the area adjacent to Runway 11 to the south would be graded to be used as the Glide Slope Critical Area. The relocated Glide Slope Critical Area is currently a depressed area with standing water, and would require the placement of fill.

Additional pavement would be required at Runway 11 to comply with FAA requirements regarding RSA lengths for Runway 11-29, and to implement the new taxiways, as shown on **Figure 1-7**. As presented in **Table 4.7-1**, there would be a net increase in impervious surface area of approximately 5.9 acres (or approximately 0.5 percent of the Pump House No. 6 drainage area of 1,261 acres). In addition, 9.76 acres of non-tidal wetlands and waters would be filled, which would eliminate a relatively small amount of storage in the 1,261-acre Pump House No. 6 drainage area. These wetlands are topographic depressions and while they contain direct rainfall and runoff from the immediately surrounding area, stormwater runoff from the existing runways and taxiways is not directed into or treated by them. The existing stormwater drainage system associated with Runway 11-29 collects and conveys stormwater runoff to Pump House No. 6. **Figure 4.7-2** shows the non-tidal wetlands impacts and impervious surfaces to be added or removed with each Airport drainage area. As shown in **Figure 4.7-2**, the impacts in the drainage area for Pump House No. 6 would be minimal relative to the size of the drainage area.

Although stormwater storage would be reduced where existing non-tidal wetlands, non-tidal waters of the U.S., and depressions are filled, the amount of storage provided by these features is relatively small compared to the total stormwater runoff volume of the Airport.

Additional pavement introduced by shifting runway thresholds, relocating service roadways, and installing new taxiways would be offset by the removal of existing roadways. The overall amount of impervious surfaces associated with the Proposed Action would decrease by approximately 1 acre. Stormwater runoff would continue to be directed to the existing detention basins at the pump houses, where sediments and potential pollutants would settle, prior to discharge to San Leandro Bay or San Francisco Bay. The Proposed Action would modify portions of the existing storm drain system and may include new catch basins, pipe, and swales coincident with the grading and earthwork activities. Modifications to the existing storm drain system as a result of grading and drainage improvements would be designed to maintain general drainage patterns, and not indirectly create new wetlands and/or waters of the U.S.

The elimination of the ponded water areas would be consistent with *Hazardous Wildlife Attractants on or near Airports*, FAA AC 150/5200-33B (FAA, 2007), which requires waterfowl attractants such as wetlands



AIRPORT DRAINAGE AREAS WITH IMPERVIOUS SURFACES AND WETLAND IMPACTS

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Oakland International Airport
Oakland, California

FIGURE 4.7-2

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Source: Aerial Photo, National Agriculture Imagery Project, 2010; Watersheds, Port of Oakland - Stormwater Infrastructure Management Plan, OAK Watershed Exhibit, Kimley-Horn & Associates, March 2009.

be located a minimum of 10,000 feet away from the nearest air operations area for airports serving turbine-powered aircraft. Therefore, the filling of existing non-tidal wetlands, non-tidal waters of the U.S., and waterfowl attractants at OAK would help to avoid the potential for aircraft-wildlife collisions.

After the implementation of the Proposed Action, the Port of Oakland (Port) would continue to comply with the Airport Group Monitoring Plan under the NPDES General Permit No. CAS000001 Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities (General Industrial Stormwater Permit).

The Proposed Action would have negligible operational impacts because it would not introduce new activities or new sources of pollutants. After completion of the Proposed Action, runways and taxiways would resume their operational functions. Aircraft activity would not be altered as a result of the Proposed Action. No additional activities, such as aircraft maintenance, would be implemented as part of the Proposed Action. Stormwater runoff would continue to be conveyed to the pump house detention basins, which would continue to provide settling capability. In addition, the Port would implement the minimization and avoidance measures listed in **Section 4.7.6** to ensure that stormwater is treated at least to pre-project levels. Stormwater monitoring would continue in accordance with the General Industrial Stormwater Permit. For all of the reasons stated above, there would be no substantial change in the quantity or quality of the stormwater discharge. Therefore, operational impacts to surface water quantity and quality would not be significant.

Groundwater

Operational activities as a result of the Proposed Action are expected to remain the same as under the No Action Alternative. Therefore, operational activities during and at the completion of the Proposed Action would not impact groundwater resources.

Potable Water

Airport activity and the number of passengers would not increase as a result of the Proposed Action; therefore, potable water use after the Proposed Action would be equivalent to the No Action Alternative. Substantial impacts to the potable water system would not occur due to the RSA Improvement Project.

No wellhead protection areas are within the boundaries or in the immediate vicinity of OAK. The Proposed Action would not require relocation or disturbance of public drinking water supply pipelines or local distribution systems.

Wastewater

Because the Proposed Action would not change activity or the number of passengers at OAK, the generation of wastewater would not be different from the No Action Alternative. The Proposed Action would not impact local wastewater collection or treatment systems.

Project Alternative A

Under Project Alternative A, the Runway 11 approach threshold would be relocated 525 feet to the northwest and the Runway 29 landing threshold would be displaced 115 feet to the northwest. The

taxiways providing access to the new and existing ends of Runway 11-29 would be added and modified in the same manner as described for the Proposed Action, with the exception of Taxiway W5, which would be taken out of service in this alternative because it would lead to and from the RSA, as described in **Section 2.5.4.2 (Figure 2-13)**. Additionally, the perimeter dike vehicle service road west of Runway 11-29 would be relocated outside of the RSAs, resulting in an increase in roadway length. The modifications to Runway 11-29, which would include minor increases in impervious surface, grading, drainage improvements, and utility relocation, would be the same as those described for the Proposed Action, with an additional 5 feet of runway pavement, which would be an additional increase of 0.06 acre of impervious surface in the Pump House No. 6 drainage area.

Potential impacts to surface water quality due to the implementation of the Project Alternative A would be essentially the same as those described for the Proposed Action. Further, potential impacts to stormwater treatment and discharge, water quality during the operation phase, groundwater, potable water, and wastewater due to the implementation of the Project Alternative A would be essentially the same as those described for the Proposed Action.

4.7.5 CONSTRUCTION IMPACTS

No Action Alternative

Under the No Action Alternative, construction of the RSA improvements would not occur. Therefore, this alternative would have no construction impacts to water resources.

Proposed Action and Project Alternative A

Construction activities associated with the Proposed Action or Project Alternative A that could impact water quality and quantity include clearing, grading, paving, excavating, placement of fill, and relocating utilities. These construction activities would be required to comply with federal, state, and local regulations. Specifically, projects with construction activities involving land disturbance of one or more acres are required to comply with the SWRCB's NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities Order No. 2010-0014-DWQ NPDES No. CAS000002 (General Construction Permit). To obtain coverage under the General Construction Permit, the Port would submit Permit Registration Documents that include a Notice of Intent to Comply with the General Construction Permit, a risk assessment to address project sediment risk and receiving water risk, post-construction calculations, a site map, a project-specific SWPPP for construction activities, and the appropriate fees. BMPs that would be implemented during construction must be identified in the SWPPP.

Implementation of the Proposed Action or Project Alternative A would be in compliance with water quality standards set forth by the San Francisco Basin Plan (RWQCB, 2010), as determined through processing a 401 Water Quality Certification Application with the San Francisco Bay RWQCB. In addition, construction activities would adhere to guidelines set forth in the General Construction Permit (2010-0014-DWQ), and the BMPs outlined in a project-specific SWPPP. Further, Construction activities would comply with earthwork, mulching, and drainage standards included in FAA AC 150/5370-10E, *Standards for Specifying Construction of Airports* (FAA, 2009b), to minimize erosion and sedimentation.

Surface Water Quality

Construction activities that could affect surface water quality include site preparation, grading, excavation, and minor drainage improvements. The construction activities have the potential to cause erosion, sedimentation, and increased turbidity in water bodies. Fluids, such as fuel or oils, leaking from vehicles and equipment used during construction have the potential to decrease surface water quality.

It is anticipated that construction would be performed during late March through October when the likelihood of measurable rainfall (0.01 inch or more) is low (less than 50 percent probability) to the extent practicable, which would serve to minimize erosion effects associated with construction. In addition, specific erosion control measures and other BMPs would be described in the project-specific SWPPP, and implemented to minimize the effects of erosion, sedimentation, and leakage of vehicle and equipment fluids.

Erosion control measures that may be implemented include, but are not limited to, minimizing the limits of construction to reduce exposed land, covering soil piles, mulching, temporary seeding, wattles, and silt fencing. The project-specific SWPPP would include specific BMPs to address the storage, handling, and disposal of fuel, oils, and other wastes from project construction activities, which could include, but are not limited to, regular maintenance of construction equipment, fueling and servicing equipment in designated locations away from water bodies, regular waste disposal, and site maintenance during construction to reduce the potential for pollutants to enter water bodies. In addition, the avoidance and minimization measures related to handling and disposing of hazardous materials and wastes would be implemented as described in **Section 4.15.5**.

The contractor would comply with federal, state, and local regulations to meet water quality objectives for water discharges. Monitoring and reporting would be required in accordance with the General Construction Permit.

The implementation of erosion control measures, BMPs and pollution prevention plans, and drainage improvements and measures identified by the San Francisco Bay RWQCB in the 401 Water Quality Certification/Waste Discharge Requirements would reduce the potential for construction discharges associated with the Proposed Action or Project Alternative A to exceed water quality standards.

Groundwater

During construction, subsurface excavation, clearing, and grading activities could intercept shallow groundwater (less than 1 foot below ground surface) depending on the season and tides, or could expose soils to erosion and sedimentation in on-site drainages, both of which can affect water quality. The contractor would implement BMPs in the event that groundwater is encountered during construction; and would treat the water as needed, and discharge it in accordance with the General Construction Permit and any other applicable federal, state, and local requirements. In addition, avoidance and minimization measures related to contaminated groundwater and dewatering would be implemented as described in **Section 4.15.5**. Therefore, impacts to groundwater during construction of the Proposed Action or Proposed Alternative A would not occur.

Potable Water

Airport activity and the number of passengers would not change as a result of the construction of the Proposed Action or Project Alternative A. Construction of the Proposed Action or Project Alternative A would not require relocation or disturbance of public drinking water supply pipelines or local distribution systems. Additionally, construction activities are not anticipated to require potable water, and the number of construction workers on site requiring potable water would be minor compared to the existing needs of Airport passengers and employees. Therefore, impacts to potable water during the construction of the Proposed Action or Project Alternative A would not occur.

Wastewater

Construction of the Proposed Action or Project Alternative A would not alter the sanitary sewer system. Additionally, construction activities and workers are not anticipated to discharge wastewater into the sanitary sewer system. Therefore, impacts to the wastewater and the sanitary sewer system during the construction of the Proposed Action or Project Alternative A would not occur.

4.7.6 MITIGATION

Avoidance and Minimization Measures

The following avoidance and minimization measures would be implemented to minimize impacts to water quality. In addition, the Port would implement general avoidance and minimization measures during construction activities in the form of standard BMPs described in **Section 4.8.6**. These measures would also serve to minimize potential impacts to water resources.

Erosion control and pollution prevention measures would be implemented to minimize impacts to water quality during construction activities. Structural BMPs, nonstructural BMPs, and compliance with a project-specific construction SWPPP would minimize impacts and contribute to compliance with water quality standards.

Avoidance and minimization measures, including post-construction BMPs, would be implemented to ensure that stormwater is treated to at least pre-project levels. Avoidance and minimization measures would be incorporated into the project design for both the Proposed Action and Project Alternative A. Existing impervious surfaces would be removed to offset the addition of new impervious surfaces. Modifications to drainage patterns and filling of wetlands would be minimized.

To avoid creation of new wetlands, soil treatment would be incorporated to minimize settlement that could cause localized depressions; the use of swales and surface ditches would be incorporated only as necessary to maintain drainage, and ongoing inspection and maintenance would be performed to identify and eliminate depressions and ponding.

In addition, the types of activities at OAK would not change as a result of the Proposed Action or Project Alternative A; therefore, there would be no new activities with potential to introduce new constituents into surface waters. Erosion control and pollution prevention measures would be designed so that water quality standards would not be exceeded. By offsetting the additional impervious surfaces with removal

of existing runway pavement, maintaining drainage patterns, continuing to implement BMPs, and use of the existing pump house detention basins as settling basins, increases in runoff flow, runoff volume, and quantity of pollutants discharged are not anticipated.

4.8 FISH, WILDLIFE, AND PLANTS

4.8.1 OVERVIEW OF IMPACTS

The No Action Alternative would not result in impacts to special-status species, common wildlife, or upland or wetland habitats.

The Proposed Action would result in the permanent and temporary removal of upland and non-tidal wetland habitats that are currently located within and directly adjacent to the RSAs. Implementation of project-related activities such as grading, paving, EMAS installation, shifting runway thresholds, and relocating the glide slope antennas and vehicle service roads, may result in permanent disturbance to non-tidal wetlands, uplands, and undeveloped lands.

Project Alternative A would result in the same impacts to non-tidal wetlands, uplands, common wildlife, and special-status species as the Proposed Action, and would also include permanent disturbance to the sand area west of Runway 11-29 for relocation of a vehicle service road and extension of the RSA to meet FAA airport design standards.

Temporary disturbances associated with either alternative could occur during construction. However, the temporary construction roads and staging areas would be placed in previously disturbed, paved, and/or ruderal areas to minimize potential impacts. In addition, the relocation of the Runway 11 approach lighting system (Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights [MALSR]) would require temporary disturbance in the sand area west of Runway 11-29.

Construction of either the Proposed Action or Project Alternative A would occur over a 3-year period, starting in 2013 through 2015 (as described in **Table 1-5**), with each year of construction focusing on specifically targeted project areas. With implementation of the impact avoidance and minimization measures, BMPs, and mitigation measures identified in this section, the impact of the Proposed Project or Alternative A on fish, wildlife, and plants would not be significant.

4.8.2 METHODOLOGY

Potential impacts to vegetation and special-status plant, wildlife, and fish species, including threatened and endangered species, were evaluated based on a review of the available literature regarding the status and known distribution of special-status species, data collected from studies conducted at OAK for other projects, biological and resource surveys (FAA, 2008; GANDA, 2008; NRM Environmental, 2007; Port of Oakland, 1997; URS, 2002, 2005a, 2007, 2008), and reconnaissance surveys in 2009, 2011, and 2012.

Special-status species data and occurrences were reviewed and assessed to determine the impact associated with the proposed alternatives. Because wildlife species use a variety of habitats for a range of activities (e.g., migration, foraging, breeding, and rearing), the determination of potential effects on a particular wildlife species was determined by a thorough review of the species life history components,

with special attention focused on the species habitat requirements for breeding, foraging, and migration. The area of potential habitat impacts was estimated by comparing the proposed limits of project disturbance with the mapped extent of habitats using GIS software. The habitat requirements were then compared with the existing conditions within the DSA to determine the potential impacts and effects on species habitat from the Proposed Action or Project Alternative A. Because the No Action Alternative would not change existing site conditions, no analysis was needed for this alternative.

The following selected sources were used in the impact analysis:

- Aerial photographs of the DSAs and vicinity (Digital Globe, 2011).
- A U.S. Fish and Wildlife Service (USFWS) Sacramento field office list of endangered and threatened species for the four U.S. Geological Survey 7.5-minute quadrangles surrounding the project area: San Leandro (447B), Hayward (447A), Oakland East (465C), and Oakland West (466D) (USFWS, 2011) (see the **Biological Assessment**, included in this document in **Appendix D**).
- A letter dated March 5, 2010, from the National Marine Fisheries Service (NMFS) to the FAA, identifying the federally listed species under their jurisdiction, and essential fish habitat with potential to occur in San Francisco Bay adjacent to the Airport (**Appendix D, Biological Assessment**).
- The California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDDB) occurrences of special-status species plants and animal species that are legally protected under the federal Endangered Species Act (ESA), California ESA, or other state and local regulations within the U.S. Geological Survey 7.5-minute topographic quadrangles in the vicinity of the RSAs and within a 10-mile radius surrounding the project area, including San Leandro (447B), Hayward (447A), Oakland East (465C), and Oakland West (466D) (CDFG, 2011)
- The California Native Plant Society On-Line Inventory of Rare and Endangered Plants for plants species listed as 1B.1, 1B.2, or 2 in the four quadrangles searched and referenced above that surround the Airport (CNPS, 2011).

A table of species observed at OAK is included in **Appendix C**. A table of federally listed species with the potential to occur within the DSA was compiled from the sources listed above and **Appendix D**.

4.8.3 THRESHOLDS OF SIGNIFICANCE

FAA Order 1050.1E, Change 1, Appendix A, Section 8.3 indicates that a significant impact to federally listed threatened and endangered species would occur when the USFWS or NMFS determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of federally designated critical habitat in the affected area. The involvement of federally listed threatened or endangered species and the possibility of impacts as potentially serious as extinction or extirpation, or destruction or adverse modification of designated critical habitat, are factors weighing in favor of a finding of significance. NEPA requires that the significance of an impact be determined based on its intensity and context (40 CFR § 1508.27). Accordingly, an action need not involve a threat of extinction to federally listed species to meet the NEPA standard of significance. Through the consultation process between the Port and the regulatory agencies and organizations having jurisdiction or

special expertise for the protection and/or management of the affected species, factors such as population dynamics, reproductive success rates, mortality rates, and population levels are also taken into consideration to provide context regarding the intensity of the potential impact. In accordance with Section 7 of the ESA, the FAA submitted a Biological Assessment to initiate formal consultation with the USFWS on February 28, 2012. The USFWS issued a Biological Opinion on June 29, 2012. The FAA also provided the Biological Assessment to the NMFS as notification that the FAA had concluded the Proposed Project would have no effect on threatened or endangered fish species or on Essential Fish Habitat designated in accordance with the Magnuson-Stevens Fisheries Conservation and Management Act. The NMFS had no comment or objection to the FAA's no effect determination (**Appendix D-3**).

4.8.4 OVERVIEW OF OPERATIONAL IMPACTS

As aircraft operations and associated aircraft noise levels would not significantly change with implementation of the No Action Alternative, Proposed Project, or Alternative A, none of these three alternatives has the potential to produce aircraft operational impacts that would significantly impact wildlife, fish, plants, or special-status species.

4.8.5 OVERVIEW OF CONSTRUCTION IMPACTS

As described in **Section 4.9.1**, the Proposed Action has been revised to reduce the impacts to wetlands and waters of the U.S., which consequently reduced impacts to federally listed species habitat. Revisions to the Proposed Action also apply to the Project Alternative A. Therefore, impacts associated with federally listed threatened and endangered species would be the same for both project alternatives. The Proposed Action would impact upland and wetland habitats that may provide suitable habitat for wildlife and vegetation, including special-status species within the DSA over a portion of the 3-year construction phases:

- Year 2013: permanent removal of wetlands, temporary disturbance to uplands
- Year 2014: temporary disturbance to uplands
- Year 2015: permanent removal of wetlands and uplands, temporary disturbance to uplands.

With implementation of the mitigation described in this section and **Appendix D**, the Proposed Action or Project Alternative A would not result in a significant impact due to the permanent removal of wildlife habitat. The specific acreage impacts and proposed mitigation measures to address these impacts are described in **Section 4.8** and **Section 4.9** of this EA. Additional information regarding impacts to protected species is provided in the Biological Opinion included in **Appendix D**.

No Action Alternative

Because the No Action Alternative would not include improvements to the RSAs, impacts to vegetation, wildlife, and fish, including special-status species, would not occur.

Proposed Action and Project Alternative A

Terrestrial Wildlife Habitats

During implementation of the Proposed Action or Project Alternative A, removal of vegetation would be required (see **Figure 3.8-1** and **Table 4.8-1**). Vegetation in wetland areas would be permanently removed to construct the vehicle service roads, to construct new and modified taxiways, and to improve the soil conditions in the RSA. Upland vegetation would be permanently removed to construct the vehicle service roads and to construct new and modified taxiways. Impacts to upland vegetation in areas of soil improvements would be of a temporary nature because these areas would be hydroseeded. The Port would take precautions to identify BMPs, and to avoid or minimize impacts to vegetation in the DSA. With implementation of mitigation, there would not be a significant impact to special-status species habitats, listed in **Table 4.8-1**.

Table 4.8-1
Impacts of Proposed Action and Project Alternative A to Special-Status Species Habitats

Wildlife Habitat	Permanent Impact (acres)
Non-tidal wetlands ¹	12.25
Tidal wetlands	0.00
Non-tidal waters of the U.S.	2.31
Tidal waters of the U.S.	0.00
Sand area	0.00
Non-native annual grassland ²	124.3

Notes:

- 1 The California clapper rail and salt marsh harvest mouse habitat are a subset of the “non-tidal wetlands” category. As much as 7.03 acres of potential habitat for the California clapper rail may be permanently impacted. Permanent impacts to potential habitat for the salt marsh harvest mouse habitat amount to 4.22 acres.
- 2 Non-native annual grassland does not provide suitable habitat for federally listed species. However, it has historically provided habitat for certain migratory birds, including western burrowing owl.

Common Wildlife

Accounting for the existing site conditions, which include fragmentation of habitats and regular Airport operation disturbance, the removal of wetlands and the temporary disturbance to upland vegetative cover associated with the Proposed Action or Project Alternative A would not result in a substantial or adverse restriction of wildlife movements between wetland or upland areas in the DSA. These disturbances would not represent a significant impact, given the threshold for significant impacts. In addition, OAK would continue to implement the existing Wildlife Hazard Management Plan to minimize the potential for wildlife-aircraft strike hazards, whether or not the RSA project proceeds. To minimize effects to common wildlife species during construction, the Port would implement BMPs and avoidance and minimization measures that would lessen the extent and severity of potential impacts on such wildlife resources.

Special-Status Plant and Wildlife Species

Habitats in the DSA that would be disturbed by construction activities may provide suitable habitat for a variety of special-status plant and wildlife species. Occurrences of special-status wildlife species have been documented in and adjacent to the DSA, while other special-status wildlife species are assumed to be potentially present based on the presence of suitable habitat and background research. Since the most recent rare plant surveys at OAK were conducted in 1993, the Airport is planning to conduct additional rare plant surveys in the summer of 2012.

Special Status Species

A total of three federally listed endangered and threatened plant species, and six special-status species, were initially identified to have the potential to occur in the GSA. After further research and background review of those species, none had the potential to occur in the DSA.

Given the existing condition of the disturbed areas in the DSA, it is unlikely that habitats in the DSA provide suitable habitat for special-status plant species. Special-status plant species are not anticipated to occur because the areas have been previously graded and are regularly disturbed. In addition, no special-status plant species have been previously observed in the areas to be disturbed by the Proposed Action or Project Alternative A.

In addition, previous surveys for special-status plant species conducted in 1991, 1992, and 1993 did not detect special-status plant species within OAK, nor were any special-status plant species detected in the 2009, 2011 or 2012 site reconnaissance surveys. No impacts to special-status plant species associated with the Proposed Action or Project Alternative A are anticipated due to the high level of historic and current site disturbances. The Port intends to establish the presence or absence of special-status plants with additional floristic surveys to occur in the summer of 2012, in accordance with the known blooming periods of rare species with potential to occur in the GSA.

Special Status Species

A total of 26 species listed as federally endangered or threatened were initially identified as having the potential to occur in the vicinity of the GSA (**Table C-1, Appendix C**). However, after background review, research, and analysis only four listed wildlife species have the potential to occur and/or have potential suitable habitat within the DSA. These species include California clapper rail (*Rallus longirostris obsoletus*), western snowy plover (*Charandrius alexandrinus nivosus*), California least tern (*Sternula antillarum browni*), and salt marsh harvest mouse (*Reithrodontomys raviventris*). As described in more detail below, the potential for the salt marsh harvest mouse to occur within the DSA is extremely low, but potential habitat for this species is present within the DSA (see **Section 3.8.4**).

In addition, a total of eight special-status wildlife species (not federally listed) have the potential to occur in the vicinity of the DSA (See **Table C-1, Appendix C**). Species of special concern and other non-federally listed special-status species with the potential to occur in the DSA include: western burrowing owl (*Athene conicularia*), northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), California black rail (*Laterallus jamaicensis*

coturniculus), Alameda song sparrow (*Melospiza melodia pusillula*), double-crested cormorant (*Phalacrocorax auritus*), and salt marsh wandering shrew (*Sorex vagrans halicoetes*). While burrowing owls occurred historically in the non-native annual grasslands at OAK, recent burrowing owl surveys at OAK have provided negative findings. Therefore, it is highly unlikely that this species occurs at OAK or may be affected by the Proposed Action. Upon further analysis, impacts to these eight non-federally listed special-status wildlife species are not anticipated due to lack of suitable habitat in the impacted area itself, ongoing human disturbance from Airport operation and maintenance activities, and negative findings from recent field surveys.

Potential Impacts to Federally Listed Species

This section describes potential impacts to federally listed species and their habitats. The evaluation was based on a review of the available literature regarding the status and known distribution of federally listed species; data collected from studies conducted at OAK; biological resource surveys (species-specific) (FAA, 2008; GANDA, 2008; NRM Environmental, 2007; Port of Oakland, 1997; URS, 2002, 2005a, 2007, 2008); and reconnaissance surveys in 2009, 2011, and 2012. In accordance with Section 7 of the ESA, the FAA submitted a Biological Assessment to initiate formal consultation with the USFWS on February 28, 2012. The USFWS issued a Biological Opinion on June 29, 2012.

The Biological Opinion identified 14 different Conservation Measures stated in the Biological Assessment or subsequent submittals to reduce the impacts of the Proposed Action on listed species. As required by the Biological Opinion, the Port will implement all 14 Conservation Measures, listed below, as part of the Proposed Action.

1. Prior to the initiation of work in the South Field (Runway 11-29), a Service-approved biologist familiar with California clapper rail biology will meet with construction personnel to conduct awareness training to: (1) provide information on California clapper rail identification, potential habitat locations to avoid, and behavior; (2) review project-specific measures implemented to minimize effects on California clapper rails; and (3) summarize all required protection measures to be implemented and complied to ensure that California clapper rails and their habitat are not impacted by construction activities.
2. Construction activities will be limited to approved work areas. Additionally, potential habitat areas and other wetlands adjacent to construction and staging areas will be marked in the field and identified as locations to avoid during contractor awareness training (Port of Oakland 2012).
3. Temporary and permanent erosion control measures will be implemented as specified in the project-specific Stormwater Pollution Prevention Plan.
4. Discharge of debris into the San Francisco Bay will be prevented during the modifications to the Runway 29 approach lights on the existing pile-supported trestle.
5. Vehicle speed limits will be implemented in the Action Area.
6. Equipment staging, material storage, and stockpile areas will be located in upland areas so as to not affect existing vegetation, jurisdictional wetlands, or any other sensitive habitat.

7. A plan for the emergency cleanup of any spills of fuel or other materials will be prepared.
8. Construction vehicles and equipment will be inspected to prevent discharge and contamination of soil or water (from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease).
9. Equipment will be refueled and serviced at designated construction staging areas.
10. After construction is completed, all stakes, temporary fencing, flagging and other refuse generated by construction will be carefully and completely removed. All debris, materials, sediment, trash, vegetation, or other material removed from the disturbed areas will be disposed of at an approved disposal site.
11. The Port proposes off-site mitigation for permanent loss of up to 7.03 acres and temporary disturbance of up to 0.74 acre of potential dispersal and foraging California clapper rail habitat associated with the RSA improvements in the Runway 11 area of the South Field. The Port proposes to provide funding to the California State Coastal Conservancy's ISP project for the enhancement (re-vegetation) of tidal marsh California clapper rail refugia habitat at a 3:1 ratio for permanent impacts and 1:1 ratio for temporary impacts. Re-vegetation by the ISP will take place in winter 2012-2013 (prior to or concurrent with impacts planned for March to July 2013) in marshes currently supporting California clapper rail or contiguous to existing habitat located a sufficient distance from OAK as to not create a wildlife strike hazard.

Following guidance from the Service, the Port also proposes the following, additional, conservation measures to directly or indirectly minimize or eliminate adverse impacts to other listed animal species with the potential to occur in the Action Area: Western snowy plover; California least tern and salt marsh harvest mouse.

12. To minimize or avoid the loss of individual Western snowy plover and California least tern, and to avoid disturbance to nesting individuals that may be encountered, the Port will conduct surveys in suitable habitat in the South Field (Runway 11 end) commencing in April 2012. Prior to construction, two Service-approved biologists with experience surveying for these species will complete four surveys as follows:
 - a. Three visual breeding season surveys in 2012 (April 23, May 30, and July). The proposed survey method is parallel visual transecting at twenty foot intervals (as requested by the Service during consultation). The objective of these surveys is to determine presence or absence of breeding adults and the need for further conservation measures. (*The Port has completed these surveys.*)
 - b. One preconstruction survey in 2013, within 30 days of construction, to obtain further information regarding absence/presence.
13. To minimize or avoid the loss of individual Western snowy plover and California least tern during nesting:

- a. If Western snowy plover nests are detected during the preconstruction survey, the Port proposes to either limit construction to September 15 to February 28, or perform no construction activities within a 600-foot buffer zone of the nest until the chicks have fledged or they are no longer using the sand area (Runway 11 end).
 - b. If California least tern nests are detected during the preconstruction survey, the Port proposes to either limit construction work to August 16 to April 14, or perform no construction activities within a 300-foot buffer zone of the nest until the chicks have fledged or they are no longer using the sand area (Runway 11 end).
14. To minimize or avoid the loss of individual salt marsh harvest mouse during construction:
- a. Where vegetation removal is required in suitable salt marsh harvest mouse habitat, work will be conducted using hand-held tools in a manner to enable and encourage wildlife to escape from the construction area. Vegetation will be removed to bare ground. Vegetation shall be removed under the supervision of the Service-approved biologist. If a mouse of any species is observed within the areas being removed of vegetation, the Service shall be notified. Vegetation removal may begin when no mice are observed and shall start at the edge farthest from the salt marsh or the poorest habitat and work its way towards the salt marsh or the better salt marsh habitat.
 - b. To prevent salt marsh harvest mice from moving through the project site during construction, temporary exclusion fencing will be installed immediately after the vegetation removal and prior to the start of any other construction activities. The temporary exclusion fencing should be made of a heavy plastic sheeting material that does not allow salt marsh harvest mice to pass through or climb, and the bottom should be buried to a depth of 2 inches so that these species cannot crawl under the fence. Temporary exclusion fencing height will be at least 12 inches higher than the highest adjacent vegetation with a maximum height of 4 feet. Temporary exclusion fencing will be removed after all construction is complete.
 - c. A Service-approved biologist with previous salt marsh harvest mouse experience will be on-site during all construction activities in suitable salt marsh harvest mouse habitat, including vegetation removal and the installation of the mouse-proof fence. The Service-approved biologist will document compliance with the project permit conditions and avoidance and conservation measures. The Service-approved biologist has the authority to stop project activities if any of the requirements associated with these measures is not being fulfilled. If the Service-approved biologist has requested work stoppage due to take of any of the listed species, the Service will be notified within one working day via email or telephone.
 - d. No materials or supplies that could potentially entrap salt marsh mice will be stored in suitable salt marsh harvest mouse habitat.

- e. A Service-approved biologist will monitor all construction activities in suitable salt marsh harvest mouse habitat daily. The Service-approved biologist will look for listed species during all construction activities in suitable salt marsh harvest mouse habitat. If a salt marsh harvest mouse, or any mouse that construction personnel may believe is this species, is encountered during project construction, all work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease, the foreman and Service-approved biologist will be immediately notified. The Service-approved biologist will monitor it until he/she determines that the animal(s) is not imperiled by predators or other dangers. The Service-approved biologist will notify the Service following any personal encounters with a potential salt marsh harvest mouse during construction within one working day via email or telephone.
- f. The Service-approved biologist will be the contact for any contractor who might inadvertently injure a salt marsh harvest mouse, or find an injured or entrapped salt marsh harvest mouse. The Service-approved biologist(s) will possess a working cellular telephone, and this phone number will be provided to the Service. The Service-approved biologist will notify the Service following any encounters by others with a potential salt marsh harvest mouse during construction within one working day via email or telephone.
- g. Prior to the start of daily construction activities in suitable salt marsh harvest mouse habitat, the contractor will inspect the salt marsh harvest mouse proof boundary fence to ensure that it is neither ripped nor has holes and that the base is still buried. The fenced area will also be inspected to ensure that no mice are trapped in it. The results of these inspections will be reported to the Service-approved biologist.

The Biological Opinion also identified three Reasonable and Prudent Measures as necessary to minimize the impacts of the Proposed Action on the California clapper rail. These are:

- 1- "The FAA shall implement the Proposed Action, including the *proposed conservation measures* as described in the Description of the Proposed Action in this Biological Opinion, unless modified by the Terms and Conditions contained in the Biological Opinion.
- 2- The FAA shall minimize adverse effects to the California clapper rail.
- 3- The FAA shall ensure their compliance with this Biological Opinion."

The Biological Opinion also states that the FAA shall ensure the Port shall comply with the following Terms and Conditions, which implement the reasonable and prudent measures described above.

The following Terms and Conditions implement Reasonable and Prudent Measures 1 and 2:

- 1- "The FAA through the Port shall minimize the potential harm or harassment of California clapper rail, western snowy plover, California least tern, and/or salt harvest mouse resulting from the Proposed Action by implementing the *proposed conservation measures*, as described in the Description of the Proposed Action of this Biological Opinion, with the inclusion of or modifications

by the following Terms and Conditions Terms and Conditions of this Biological Opinion for the Proposed Action.

- 2- The FAA through the Port shall include Special Provisions that incorporate the *proposed conservation measures* and the Terms and Conditions of this Biological Opinion in the solicitations for bid information. In addition, the FAA and the Port shall inform all contractors and subcontractors involved in the Proposed Action about the requirements of this Biological Opinion.
- 3- The Service-approved biologist(s) will conduct environmental awareness training which includes all protection measures to be implemented and complied with to ensure that California clapper rail and salt marsh harvest mouse are not affected by work activities. New employees shall attend a training session prior to participating in work activities.”

The following Terms and Conditions implement Reasonable and Prudent 3:

- 1- “If requested, before, during, or upon completion of any work activities in the action area, the FAA through the Port shall allow access by Service personnel to the work areas to inspect effects to the California clapper rail and California clapper rail habitat.
- 2- The FAA through the Port shall submit a post-project compliance report prepared by a Service-approved biologist(s) to the Service’s Sacramento Fish and Wildlife Office within sixty (60) calendar days following completion of the Runway 11 work in the South Field. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the Proposed Action in meeting the *proposed conservation measures* and Terms and Conditions of this Biological Opinion; (iii) an explanation of any failure to meet such measures; (iv) known project effects on the California clapper rail, if any; including loss of habitat at Runway 11; (v) occurrences of incidental take of listed species; (vi) documentation of employee environmental awareness training; (vii) documentation of biological monitoring in suitable salt marsh harvest mouse habitat and (viii) other pertinent information.
- 3- The FAA through the Port shall comply with all reporting requirements in this Biological Opinion.”

The Reasonable and Prudent Measures, Terms and Conditions, and Conservation Measures required by the Biological Opinion (Appendix D-2) will be implemented and are summarized under individual species discussion in this EA.

Western Snowy Plover and California Least Tern. As described in **Section 3.8.4, Special Status Species**, the western snowy plover and California least tern can co-occur in the sand area found in the DSA. Accordingly, they have been addressed together for the purposes of this EA.

Relocation of the Runway 11 MALSR required as part of the Proposed Action or Project Alternative A, would result in the temporary disturbance of upland habitat during construction (see Photograph number 8 in **Appendix D, Biological Assessment**). The sand area could potentially be used for nesting activities by these two species; if nesting western snowy plovers or California least terns are present, they would be identified during preconstruction surveys and avoided during the breeding season. However, there would be no permanent habitat impacts as a result of the lighting system relocation. The existing

lighting posts in this area are being relocated from their current locations, and the work would be conducted in a 1.5-month time frame.

Indirect impacts to the western snowy plover and California least tern may result from increased human presence in the sand area during removal, installation of the new lighting system, and heavy equipment movement around the area. Indirect impacts may elicit a variety of responses, ranging from no direct response on the part of individual terns and plovers in the area, to flushing, leaving the area, increased vigilance, or simply avoiding certain areas. Through implementation of avoidance and minimization measures, including species-specific measures described in **Section 4.8.6**, the Proposed Action or Project Alternative A would avoid and minimize impacts to the western snowy plover and California least tern. The removal and installation of the lighting system would not have a permanent indirect impact on the western snowy plover and/or California least tern habitat in the DSA.

Project Alternative A would have impacts similar to those described above for the Proposed Action, and there would be no net impact to the sand area through extension of the RSA and relocation of the MALSR in that area. There would not be a permanent loss of suitable habitat associated with the relocation of the vehicle service road to the west around the extended RSA. With implementation of avoidance and minimization measures for the western snowy plover and California least tern, impacts resulting from Project Alternative A would not be significant.

Although the sand area on South Field is considered suitable habitat for the western snowy plover and the California least tern, these species have not been known to nest at this location in over a decade. As described in **Section 4.8.6**, a USFWS-approved biologist will undertake surveys prior to and during construction of the MALSR in the sand area and buffer zones, and/or seasonal restrictions would be implemented if western snowy plovers or California least terns were detected. With implementation of these measures, this project would not result in a significant impact on the western snowy plover or the California least tern. Under the ESA consultation, the FAA has determined the Proposed Action is not likely to adversely affect the western snowy plover and California least tern.

California Clapper Rail. As described in **Section 3.8.4**, based on the absence of suitable habitat and predation pressure, it is not likely that nesting California clapper rail are present in the DSA (Raabe, 2011). However, juvenile migrants have potential to occur occasionally in non-tidal wetlands of the South Field, while dispersing from nearby regional populations in the San Leandro Bay wetland complex (see Photo 1, **Appendix D, Biological Assessment**). Use of this area by dispersing juvenile or adult rails is likely rare throughout the year, with sporadic presence slightly increasing during the post-breeding dispersal period.

Construction activities in or adjacent to the non-tidal wetlands in the South Field may directly impact this species. Direct impacts to California clapper rail incidentally occurring in an active work area may include alarm response on the part of the bird, causing it to flush, run away from the source of disturbance, or wait out the disturbance. Flushing birds are more visible to predators. Direct contact between California clapper rails and construction equipment, although extremely unlikely, is possible, and could result in injury or death of individual birds. Preconstruction surveys during site preparation by a USFWS-approved

biologist would reduce potential direct effects to this species. Such measures are described in **Section 4.8.6**.

California clapper rail foraging, nesting, and breeding habitat depends on tidal channels to provide a prey base for consumption, and vegetation to provide cover. The non-tidal wetlands and waters of the U.S. impacted by the Proposed Action or Project Alternative A lack tidal channels and prey availability, but superficially resemble California clapper rail habitat in that the non-tidal brackish ponds (waters of the U.S.) consist primarily of a linear series of low-growing stands of pickleweed (*Salicornia virginica*) and saltgrass (*Distichlis spicata*) that could potentially provide cover from predators. The Runway 11 area of the South Field is host to non-tidal wetlands with these characteristics that could provide potential dispersal and marginal foraging habitat for the juvenile California clapper rail. For these reasons, in addition to the presence of higher-quality foraging habitat in the San Leandro Bay wetland complex, use of this area by dispersing juvenile or adult rails is likely rare throughout the year, with sporadic presence slightly increasing during the post-breeding dispersal period.

The Proposed Action or Project Alternative A would result in the permanent loss of up to 7.03 acres of marginal California clapper rail dispersal areas in the Runway 11 area of the South Field. The Proposed Action or Project Alternative A would reduce the area of non-tidal wetland habitat available to dispersing rails, but would only marginally degrade the overall habitat quality in the DSA, because two critical components of California clapper rail foraging habitat (vegetative cover and prey availability) are already absent. The Proposed Action or Project Alternative A would also temporarily affect 0.51 acre of wetlands in the Runway 11 area of the South Field that also provides marginal habitat for California clapper rail. Permanent and temporary impacts to this marginal habitat would be offset by proposed off-Airport compensatory mitigation.

Habitat degradation from erosion and sedimentation could occur on the inboard side of the perimeter dike, but is unlikely to impact clapper rails. Foraging habitat adjacent to the construction boundaries is non-tidal, and so is generally devoid of rail prey, such as mussels, crabs, and other common marine macro-invertebrates. For this reason, increased turbidity of the non-tidal waters that occur along the southern perimeter would not significantly alter prey availability. Sediment discharge into marginal foraging habitats (non-tidal wetlands) would be reduced to ecologically insignificant and discountable levels with the implementation of standard erosion control measures and BMPs. Under the ESA consultation, FAA has determined the Proposed Action may adversely affect the California clapper rail. However, this impact would not be significant with implementation of avoidance and minimization measures and incorporation of mitigation.

Salt Marsh Harvest Mouse. As described in **Section 3.8.4**, the potential for the salt marsh harvest mouse to occur within the DSA is extremely low, and it is probable that this species does not occur at OAK. Potential habitat for this species is, however, present at the Airport and within the DSA. The Proposed Action would permanently remove 4.22 acres and temporarily disturb 0.42 acre of non-tidal and seasonal wetlands that are potentially suitable for the salt marsh harvest mouse. Of these, only 0.23 acre of permanent impacts, and 0.13 acre of temporary impacts, occur outside impacted California clapper rail habitat. Total impacts to non-tidal and seasonal wetland habitat for the salt marsh harvest mouse and California clapper rail are up to 7.26 (permanent) and 0.64 (temporary) acres, cumulatively.

Although it is unlikely that the salt marsh harvest mouse occurs within the DSA, with Implementation of construction BMPs and species-specific mitigation measures, potential impacts would reduce impacts to the salt marsh harvest mouse to non-significant levels. BMPs and species-specific mitigation measures are described in **Section 4.8.6**. Under the ESA consultation, FAA has determined the Proposed Action is not likely to adversely affect the salt marsh harvest mouse. This impact would not be significant with implementation of avoidance and minimization measures and incorporation of mitigation.

Special-Status Fish Species. The Central California Coast steelhead evolutionarily significant unit, the green sturgeon southern distinct population segment, and the longfin smelt are all present in the San Francisco Bay. The relocation of the light system at Runway 29 would be conducted on an existing trestle structure. The work will not include in-water work or any discharge of materials into San Francisco Bay. Additionally, construction activities would occur within a 1.5-month timeframe, and the implementation of BMPs will further avoid any effects to species. Since none of the Proposed Action or Project Alternative A would include work in San Francisco Bay, there would be no effect on the Central California Coast steelhead evolutionarily significant unit, the green sturgeon southern distinct population segment, their designated critical habitat, or the longfin smelt.

4.8.6 MITIGATION

The Proposed Action and Project Alternative A would result in the direct removal of upland and wetland habitats currently located within the DSA. Although these areas provide some habitat for plants and wildlife, the land uses and habitat affected by the Proposed Action or Project Alternative A are not high quality habitat for special-status species. Accordingly, with implementation of the following avoidance and minimization measures and offsite mitigation, potential impacts to sensitive plant and wildlife species would not be significant.

Avoidance and Minimization Measures

The following general and species-specific avoidance and minimization measures would limit the potential for impacts to wildlife and plant resources and habitat, including federally and state-listed special-status species. These measures would be implemented in compliance with the Port-approved protocol for BMPs, to the maximum extent feasible.

These measures have been further revised in coordination and consultation with the USFWS, the NMFS and the CDFG. The proposed measures include actions that would reduce the potential for species to be directly affected by construction activities, by conducting preconstruction surveys to identify the presence of any special-status species; providing environmental awareness training; using species-specific avoidance and minimization measures; and providing offsite mitigation. Measures for the Proposed Action or Project Alternative A indirect impacts to vegetation and wildlife are also discussed under **Section 4.7, Water Resources; Section 4.9, Wetlands and Waters of the U.S.;** and **Section 4.15, Hazardous Materials, Pollution Prevention, and Solid Waste.**

General Avoidance and Minimization Measures

The Port would implement general avoidance and minimization measures during construction activities in the form of standard BMPs. These BMPs include, but are not limited to:

- Construction activities would be limited to areas within 20 feet of the RSA improvement areas.
- Temporary and permanent erosion control measures would be implemented as specified in the project-specific SWPPP. Additionally, all stormwater runoff in the Airport discharges to the detention basins of the pump stations and not directly into San Francisco Bay. Stormwater runoff would be managed as required by the SWRCB and the San Francisco Bay RWQCB.
- Discharge into the San Francisco Bay would be prevented during the modifications to the Runway 29 approach lights on the existing pile-supported trestle.
- Vehicle speed limits would be implemented in the DSA.
- Equipment staging, material storage, and stockpile areas would be located in upland areas so as not affect existing vegetation, jurisdictional wetlands, or any other sensitive habitat.
- A plan for the emergency cleanup of any spills of fuel or other materials would be prepared.
- Construction vehicles and equipment would be inspected to prevent discharge and contamination of soil or water (from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease).
- Equipment would be refueled and serviced at designated construction staging areas.
- All debris materials, sediment, trash, vegetation, or other material removed from the disturbed areas would be disposed of at an approved disposal site. Non-tidal wetlands and waters of the U.S. to be avoided will be marked in the field.

Environmental Awareness Training

A USFWS-approved biologist would conduct environmental awareness training for all construction crews and contractors working in sensitive habitats (e.g., habitats potentially occupied by California clapper rail, or nesting western snowy plover, California least tern, or salt marsh harvest mouse) before work on the project is initiated. The training would include a brief review of the California clapper rail, salt marsh harvest mouse, western snowy plover, California least tern, and other sensitive resources that may exist in the DSA, including the life history of each species, field identification, and the habitat requirements of each species; the locations of sensitive biological resources; the legal status and ESA protection of each species; the project's avoidance and minimization measures; environmental permits; and regulatory compliance requirements.

New workers who arrive after the start of construction would be trained as needed by a designated on-site supervisor. Additional training would be conducted as needed, including morning "tailgate" sessions, to update crews as the work progresses. A record of all personnel trained during the project will be maintained, and this record would be made available for compliance verification. In addition, training materials, written documentation, photographs, and/or interpretive signs would be provided to the work

crew with details on sensitive resources, resource avoidance, permit conditions, and possible fines for violations of state or federal environmental laws.

In addition, the Port would implement the following species-specific avoidance and minimization measures.

Species-Specific Avoidance and Minimization Measures

Western Burrowing Owl

As discussed in **Section 3.8.4**, western burrowing owls have not been identified during protocol surveys in recent years. It is therefore unlikely that this species occurs in the DSA. As such, this species was not included in the discussion in **Section 3.8**. However, given their historical occurrence in the DSA, a preconstruction survey for this species would be included in any special-status species survey conducted 30 days prior to the start of construction activities. If burrowing owls are observed within the DSA, the Port would implement the existing CDFG protocols identified in the Burrowing Owl Management Plan (The California Burrowing Owl Consortium, 1993).

Migratory Birds

A pre-construction survey for nesting migratory birds will be conducted 30 days prior to the start of construction activities. In the unlikely event that a migratory bird is observed nesting within the project area, the Port will contact CDFG immediately and implement measures (such as a construction buffer, and agency approved biologist onsite, or time avoidance) to avoid any impact to the nest and the nesting bird.

Western Snowy Plover and California Least Tern

Surveys

Although the sand area at the South Field is potentially suitable habitat for the western snowy plover and California least tern, these species have not been known to nest at this location in more than a decade. The Port would conduct surveys commencing in April 2012, as described in **Appendix D**. Four surveys are proposed prior to construction: three in the 2012 breeding season (mid-April, May, and July), and one preconstruction survey in 2013.

The breeding seasons are as follows (Raabe, 2011):

- Western snowy plover: March 1 through September 14.
- California least tern: April 15 through August 15.

The seasonal restrictions or buffer zones described below would be implemented if nests are detected during the 2013 preconstruction surveys.

Seasonal Work Restrictions and Buffer Zones Until the Chicks Have Fledged

Western snowy plover. If nests are detected during the preconstruction survey, then either the construction work would be limited to September 15 through February 28, or no activities would be performed within a 600-foot buffer zone of the nest until the chicks have fledged or they are no longer using the sand area.

California least tern. If nests are detected, then either the construction work would be limited to August 16 through April 14, or no activities would be performed within a 300-foot buffer zone of the nest until the chicks have fledged or they are no longer using the sand area.

Salt Marsh Harvest Mouse

The Port proposes to implement the following species-specific conservation measures to avoid and/or minimize potential impacts to the salt marsh harvest mouse. These measures, along with other species-specific measures described in the Biological Opinion (**Appendix D**), would be implemented in addition to the proposed general construction BMPs and environmental awareness training described above.

Habitat Exclusion Fencing

Prior to vegetation removal, plastic fencing would be installed around the margins of work areas within dense stands of pickleweed that are potential habitat for the salt marsh harvest mouse. Plastic fencing would meet USFWS and CDFG design standards for exclusion of potential salt marsh harvest mice in the work area. The exclusion fencing would be installed with an opening to the adjacent habitat with the highest cover of pickleweed. Vegetation removal within the fenced area would proceed toward the opening in the fence to allow any mice within the fenced area to passively relocate through the opening into adjacent habitat. The opening would be closed after the vegetation has been cleared.

Use of Hand-Operated Equipment

The contractor would use hand-operated equipment to remove vegetation within the marked areas.

Offsite Mitigation

Offsite habitat enhancement or creation proposed for the California clapper rail, as described below, may provide benefits for the salt marsh harvest mouse. No additional offsite mitigation is considered necessary for the salt marsh harvest mouse.

California Clapper Rails***Offsite Mitigation***

This section of this EA discusses the offsite program proposed by the Port to mitigate unavoidable impacts to both wetland resources and protected species habitat.

Requirements for Mitigation for Impacts to Federally Listed Species

Under Section 7 of the Endangered Species Act, a federal agency is required to consult with the USFWS and/or NMFS regarding the potential impacts to federally listed species and designated critical habitat (16 USC 1536). Under Section 7 of the ESA, FAA submitted a Biological Assessment to initiate formal consultation with USFWS on February 28, 2012. The USFWS issued its Biological Opinion on June 29, 2012 and identified compensation measures for impacts to potential California clapper rail habitat. FAA also submitted the Biological Assessment to NMFS as a notification of no effects to fish species under their jurisdiction. The NMFS had no comment or objection to the FAA's no effect determination on threatened or endangered fish species or on Essential Fish Habitat (**Appendix D-3**).

Compensatory Mitigation Limitations

The unavoidable permanent impact to as much as 7.03 acres of non-tidal wetlands, which could be potential dispersal and marginal foraging habitat for the California clapper rail, resulting from the Proposed Action would be addressed through implementation of offsite mitigation. Offsite mitigation would also be provided for 0.51 acre of temporary effects to potential California clapper rail habitat. Offsite mitigation would be required because placing habitat or aquatic mitigation areas on site at OAK to compensate for endangered species or wetland impacts would be inconsistent with the following federal regulations and guidelines:

- Memorandum of Agreement between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, U.S. EPA, the USFWS, and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes (2003), which established procedures to address existing and future environmental conditions contributing to aircraft-wildlife strikes.
- FAA AC 150/5200-33B *Hazardous Wildlife Attractants on or near Airports* recommends a minimum separation distance of 10,000 feet between aircraft operations areas of airports serving turbine jet aircraft, and hazardous wildlife attractants, and recommends a distance of 5 statute miles between the airport operations area and hazardous wildlife attractants if the attractant could cause hazardous wildlife movement into or across the airport's approach or departure airspace.
- FAA regulations regarding certification of commercial service airports at 14 CFR § 139.337, which requires that OAK, as a commercial service airport, alleviate wildlife-aircraft collision strike hazards.
- U.S. Army Corps of Engineers (USACE) regulations for compensatory mitigation for losses of aquatic resources at 33 CFR § 332.3 (b) (1), which states that compensatory mitigation projects should not be located where they will increase risks to aviation by attracting wildlife to areas where aircraft-wildlife strikes may occur.

As part of the consultation process, the FAA and the Port have met with the USFWS (February 2010, January 2011, May 2011, September 2011, and December 2011) and NMFS (February 2011) and CDFG (February 2011 and December 2011) to obtain guidance on key issues that need to be addressed.

During these meetings, the USFWS noted the need for mitigation for adverse effects to federally listed species.

As described in **Section 4.9**, the Port has revised the Proposed Action, and the impacts to wetlands and waters of the U.S. have been reduced. Based on this consultation, the Port proposes to complete the offsite mitigation described below that would improve existing California clapper rail habitats.

The selected offsite mitigation would provide an overall increase in tidal wetlands and high ecological value California clapper rail habitat, with functional linkages to existing populations. The offsite mitigation would offset the loss of marginal habitat in the Runway 11 area at OAK with an overall increase of high-quality and ecologically contiguous wetland habitat. In addition to the specific measures for California clapper rail, the Port will implement additional wetland mitigation that may provide incidental benefits for this species.

Proposed Compensatory Mitigation for California Clapper Rail Habitat

The Port proposes offsite mitigation for habitat to offset the loss of potential dispersal and marginal California clapper rail habitat.

Vegetation Management. Vegetation management activities would create or enhance high-tide refugia and increase foraging and nesting habitat for the California clapper rail. The proposed activities would focus on two objectives:

- Enhance and accelerate marsh succession and complexity with plantings of gumplant (*Grindelia stricta*), which have a tall shrubby structure and provide California clapper rail nesting substrate, cover and high-tide refugia.
- Enhance and accelerate re-establishment of native cord grass (*Spartina foliosa*) at selected marshes using plugs or propagated seedlings to support California clapper rail foraging and nesting habitat.

As noted above, these activities would be coordinated with the Invasive *Spartina* Project consistent with the 2012 California Clapper Rail Habitat Enhancement, Restoration and Monitoring Plan (ISP, 2012). For more details regarding the vegetation plan, please refer to the Biological Opinion (**Appendix D**).

Funding. Concurrent with the start of construction of the Runway 11 RSA improvements, the Port would fund vegetation management activities for enhancement of tidal marsh habitat. The Port will provide funding through a contract with the California State Coastal Conservancy for the Invasive *Spartina* Project.

4.9 WETLANDS AND WATERS OF THE U.S.

4.9.1 OVERVIEW OF IMPACTS

The No Action Alternative would not result in loss of wetlands or waters within the DSA at OAK.

Following the release of the Draft EA, the project team worked to refine the design of the project to see if any additional reductions in wetland fill for the Proposed Action were available. The following modifications were found to further reduce impacts to wetlands and other waters of the U.S.

Revised Fill Estimates for Runway 11-29: One of the project components with the greatest impact to wetlands is the relocation of the glide slope antennae from the northeast side to the southwest side of Runway 11-29. Accordingly, the project team reviewed options to further reduce wetland fill for Runway 11-29 after the release of the Draft EA.

The technical basis for the glide slope antenna relocation is provided in **Section 1.2.2**. In addition to the relocation of the antenna hardware and infrastructure, the land area adjacent to the antenna (the so-called critical area) must be drained and graded to meet FAA standards.

For the development of runway-specific RSA Alternative 2A, the dimensions of the critical area used in the Draft EA were taken from FAA AC 150/–13, *Airport Design*. These standard design dimensions may be larger than actually needed in the field for the antenna to function properly based on local topography. For Runway 11, the use of standard design dimensions resulted in a large critical area, the draining and grading of which would have a significant impact to wetlands and waters of the U.S. Following the release of the Draft EA, FAA's Operations Engineering Support Group issued a study report, *Oakland Runway 11 AAZ Glideslope Feasibility Study, May 18, 2012*, which analyzed the performance of the proposed Runway 11 glide slope antenna, relocated to the southeast side of the runway. This study considered the radar signal propagation characteristics of the antenna, and the site-specific topography surrounding Runway 11. The objective was to determine what the size of the relocated critical area must be to provide a suitable vertical guidance signal to approaching aircraft. The study found that a relocated antenna would function properly with a graded and drained critical area that is significantly smaller than the standard dimensions considered in the Draft EA for runway-specific RSA Alternative 2A. The FAA study established the basis for the design engineers to significantly reduce the Runway 11 glide slope critical area from the standard dimensions, and still provide sufficient area for the glide slope to function properly. This significantly reduced (by approximately 3.87 acres) the impacts to wetlands and waters of the U.S. associated with the refined Proposed action design.

In addition, a small reduction in impacts to wetlands and waters of the U.S. was achieved by revising the grading boundary (i.e., the toe of slope) for Taxiway W at both the Runway 11 end (0.34 acre) and the Runway 29 end (0.03 acre). A further refinement of the RSA design resulted in an additional reduction of 0.59 acre to wetlands and waters of the U.S. Consequently, permanent impacts initially identified in the Draft EA of 14.59 acres for Runway 11-29 RSA improvements were reduced to 9.76 acres, a decrease of 4.83 acres.

The other reduced fill concept for Runway 11-29 was a change in the construction buffer zone for temporary impacts based on further engineering design. A conservative 25-foot impact zone beyond the boundary of the permanent impact zone was used in the Draft EA to calculate the temporary impacts. After additional engineering refinement, the project team has determined that this construction buffer zone can be held to 20 feet typically throughout the project area, and to 10 feet in the area surrounding the Runway 11 glide slope antenna critical area. This reduction is based on consultation with URS Corporation design engineers

and construction managers, who advise that a 20-foot construction buffer zone is adequate to construct runway-specific RSA Alternative 2A, and that the construction specifications and processes can be developed and enforced to implement these requirements. The project construction documents will include provisions to limit the construction buffer zone between permanent and temporary construction to 20 feet typically and 10 feet surrounding the Runway 11 glide slope antenna critical area.

For Runway 11-29 runway-specific RSA Alternative 2A, the change in the construction buffer zone described above resulted in a change in impacts to temporary wetlands and waters of the U.S. from 2.37 acres, initially identified in the Draft EA, to 1.24 acres—a reduction of 1.13 acre.

Revised Fill Estimates for Runways 9R-27L and 9L-27R: As described above for Runway 11-29, for Runways 9R-27L and 9L-27R runway-specific RSA Alternative 7B, the Port was able to design the project to work within a smaller temporary impact construction buffer zone. In the Draft EA, a construction buffer zone of 25 feet was used to calculate the temporary impacts. The wetland calculations upon which the Draft EA was based assumed that the zone of temporary wetland impact would necessarily extend 25 feet from the boundary of any permanent impact zone. As described above, this reduction is based on consultation with URS Corporation design engineers and construction managers, who advised that the 20-foot construction buffer zone is adequate to construct RSA Alternative 7B, and that construction specifications and processes can be developed and enforced to ensure that the zone of temporary impacts does not extend more than 20 feet from the boundary of any permanent impact zone. The project construction documents will include appropriate construction design specifications that ensure the 20-foot construction buffer zone. For Runways 9R-27L and 9L-27R runway-specific RSA Alternative 7B, the reduction in the temporary impact area from 25 feet to 20 feet resulted in a reduction in temporary impacts to wetlands and waters of the U.S. from 0.7 acre, initially identified in the Draft EA, to 0.56 acre—a reduction of 0.13 acre.

Revisions to the Proposed Action apply to the Project Alternative A. Therefore, impacts to wetlands and waters of the U.S. would be the same for both project alternatives.

Construction of the Proposed Action and Project Alternative A would occur over a 3-year period, from 2013 through 2015, with each year of construction focusing on specifically targeted project areas. Impacts would occur to non-tidal wetlands and other waters within the DSA. No impacts to tidal wetlands would occur at OAK.

The Proposed Action and Project Alternative A would result in direct and indirect impacts to non-tidal wetlands and other waters within the DSA through direct removal of wetlands and waters of the U.S. (i.e., placing fill material, grading, etc.) located in the RSA, in both North Field and South Field. The impacts cannot be avoided due to the landscape position of the features as they relate to the existing runways alignments, and the FAA-RSA design standards. The terms “wetlands” and “waters of the U.S.” used in this discussion refer to wetlands and waters within Clean Water Act jurisdiction.

The wetland functions currently provided by these areas would be directly affected through the conversion of these areas to uplands. The loss of functions associated with habitat for plants and wildlife are described in **Section 4.8, Fish, Wildlife, and Plants**, and detailed in **Table 4.9-1**.

**Table 4.9-1
Functions of Wetlands and Waters of the U.S. Impacted by
OAK RSA Improvement Project**

Function	Applicability to Area
Groundwater Recharge/Discharge	All of the impacted non-tidal wetlands and waters of the U.S. are seasonal resources. The affected non-tidal wetlands provide limited groundwater recharge on a seasonal basis.
Flood Storage/Desynchronization	The existing non-tidal wetlands and waters of the U.S. provide a small amount of flood storage capacity. They also function to slow and hold sheet flow and allow sediment to settle out of the water column.
Nutrient Retention/Transformation	There is likely some nutrient input to the affected wetlands and waters of the U.S. The non-tidal wetlands and waters of the U.S. could perform a limited role in nutrient retention/transformation in the limited vegetated wetland areas.
Nutrient Production/Export	Nutrients such as phosphorus and nitrogen undergo transformation within wetland systems, often as inorganic nutrients, and are incorporated into plant and animal matter which is exported in organic form. The affected non-tidal wetlands, given their generally limited vegetation growth, may therefore play a small role in nutrient production and export.
Aquatic Diversity/Abundance	Aquatic inhabitants within the project's non-tidal wetlands and waters of the U.S. may include aquatic invertebrates and amphibians.
Fish/Shellfish Habitat	The non-tidal waters of the U.S. do not provide habitat for these species given the isolation from tidal flow and lack of connectivity to other aquatic habitat areas.
Wildlife Habitat	The non-tidal wetlands and waters of the U.S. may provide suitable low quality habitat (i.e., foraging, resting, breeding, and/or nesting) for common wildlife, including small mammals and birds, that have the potential to occur in the area. The non-tidal wetlands and waters of the U.S. in South Field provide a better quality habitat than in North Field, but overall the habitat values are low.
Endangered Species	The non-tidal wetlands in the DSA may provide potential dispersal and marginal foraging habitat for the California clapper rail. However, as discussed in Section 4.8.5 , this habitat has degraded characteristics that make the potential for listed species to occur low. The non-tidal wetlands do not provide high quality suitable habitat (i.e., pickleweed marsh) for salt marsh harvest mouse.
Values	
Consumptive Recreation	Not applicable
Non-consumptive Recreation	Not applicable
Uniqueness/Heritage	No historical structures or other historical or unique features exist with the Area of Potential Effects (defined in Section 3.12).
Ecological Integrity/Fragmentation	The affected non-tidal wetlands and waters of the U.S. total approximately 14.56 acres of fragmented habitat. The ecological integrity of the non-impacted wetlands and waters of the U.S. would not be compromised as a result of the project improvements due to the low quality habitat and fragmented nature of the wetlands and waters of the U.S. that are impacted by the RSA Improvement Project. Loss of aquatic functions and values would be minimal.

Notes:

OAK = Oakland International Airport

RSA = Runway Safety Area

DSA = Detailed Study Area

Source: Huffman-Chow, 2006.

The majority of direct impacts to non-tidal wetlands and waters of the U.S. would be permanent, to ensure the RSA meets FAA design standards for safety and emergency vehicles (see **Sections 4.9.4** and **4.9.5**).

With the reductions in impacts to wetlands and waters of the U.S. described above, the Proposed Action would result in the permanent conversion to uplands of approximately 12.25 acres of wetlands and 2.31 acres of waters of the U.S. for a combined total of 14.56 acres of permanent impacts. Further, the Proposed Action would result in the temporary loss of approximately 1.47 acres of wetlands and approximately 0.34 acre of waters of the U.S. for a combined total of 1.81 acres of temporary impacts. Consequently, the total permanent impacts to wetlands and waters of the U.S. of 19.39 acres, as identified in the Draft EA, were reduced to 14.56 acres in this Final EA – a decrease of 4.83 acres. The total temporary impacts to wetlands and waters of the U.S. of 3.08 acres, as identified in the Draft EA, were reduced to 1.81 acres in this Final EA – a decrease of 1.27 acres. Table 1-1 of Appendix I-3 shows complete details of reductions in impacts to wetlands and waters of the U.S. achieved between publication of the Draft EA and this Final EA.

Indirect impacts are those impacts that would occur in areas within the DSA, but outside of the areas directly impacted during project implementation, and/or would result at a later point in time. Indirect impacts may occur as a result of erosion, sedimentation, and change to hydrology. Habitat for plants and wildlife currently occurring within these areas is expected to have minor temporary changes, and the existing wetland functions and values would not be altered.

As described in **Chapter 1**, the basic project purpose is to enhance aviation safety, which will be accomplished by improving runway safety areas to meet FAA RSA design standards. As discussed in **Chapter 2**, alternative designs that might reduce impacts to wetlands were found to be impracticable. Accordingly, impacts to non-tidal wetlands and waters of the U.S. associated with the Proposed Action would be unavoidable. The two alternatives carried forward (Proposed Action and Project Alternative A) minimize impacts to wetlands to the greatest extent practicable. Accordingly, this EA includes mitigation to reduce impacts of the Proposed Action and Project Alternative A to wetlands and waters of the U.S.

4.9.2 METHODOLOGY

Potential impacts to wetlands, as a result of the Proposed Action and Project Alternative A, have been determined through review of the USACE's approved jurisdictional delineation dated March 15, 2011 (USACE, 2011). This evaluation also used the approved re-verification (USACE File No. 252600S) of wetlands and waters of the U.S. located at OAK. All references to wetlands and waters of the U.S. in this document refer to those identified in the 2011 USACE Jurisdictional Delineation. Documentation associated with Port and FAA coordination with the USACE in regard to the Proposed Action is provided in **Appendix E**. The Port submitted a permit application to the USACE to comply with Section 404 of the Clean Water Act on March 1, 2012.

Potential impacts to non-tidal wetlands and waters of the U.S. were determined by overlaying the project footprint over the 2011 verified wetland delineation map (see **Section 3.9, Figure 3.9-1**). Impacts to non-tidal wetland and waters of the U.S. by construction year or project phase were then calculated by acreage using GIS.

Because the No Action Alternative would not change the existing site conditions, no analysis was needed for this alternative.

4.9.3 THRESHOLDS OF SIGNIFICANCE

In accordance with FAA Order 1050.1E (FAA, 2006a), a Proposed Action is considered to result in significant impacts to wetlands and waters of the U.S. if it would:

- Adversely affect a wetland's function to protect the quality or quantity of a municipal water supply, including sole source aquifers and a potable water aquifer;
- Substantially alter the hydrology needed to sustain the affected wetland's values and functions or those of a wetland to which it is connected;
- Substantially reduce the affected wetlands' ability to retain floodwaters or storm runoff, thereby threatening public health, safety, or welfare. The last term includes cultural, recreational, and scientific public resources or property;
- Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;
- Promote development that causes any of the above impacts; or
- Be inconsistent with applicable state wetland strategies.

4.9.4 OPERATIONAL IMPACTS

The operational activities related to the No Action Alternative, the Proposed Action, and Project Alternative A were reviewed for the potential impacts to wetlands and waters of the U.S. The Proposed Action and Project Alternative A would not result in any change in the number and types of aviation operations at OAK. As aircraft operations would not significantly change with implementation of the No Action Alternative, Proposed Project, or Alternative A, none of these three alternatives has the potential to produce aircraft operational impacts that would significantly impact wetlands or other waters.

4.9.5 CONSTRUCTION IMPACTS

No Action Alternative

Under the No Action Alternative, the RSA Improvement Project would not modify or require filling of the wetlands or waters. Existing functions of the wetlands and waters of the U.S. would be retained, and functions provided to wildlife, plants, and hydrology would not be affected. No ground disturbance would occur under the No Action Alternative. Therefore, no impacts to wetlands or waters of the U.S. would occur.

Proposed Action

As a result of the Proposed Action, approximately 14.56 acres of non-tidal wetlands and waters of the U.S. would be impacted through the placement of fill material. **Table 4.9-2** presents the acreages of potential permanent and temporary impacts, respectively, the Proposed Action would have on wetlands

Table 4.9-2
Impacts of Proposed Action and Project Alternative A to Wetlands and Waters of the U.S.

Feature	Permanent Impacts (acres)	Temporary Impacts (acres)
Non-tidal wetland	12.251	1.467
Non-tidal waters of the U.S.	2.307	0.340
Total	14.558	1.807

Source: Areas calculated by URS Corporation using GIS

and waters of the U.S. that would result from construction. These impacts are depicted graphically on **Figures 4.9-1, 4.9-2, 4.9-3, 4.9-4, 4.9-5, and 4.9-6**. In summary, construction of the Proposed Action would have a significant permanent impact on 12.25 acres of non-tidal wetlands, and 2.31 acres of non-tidal waters of the U.S. Also, construction of the Proposed Action would have a temporary impact on 1.47 acres of non-tidal wetlands, and 0.34 acre of waters of the U.S. However, with implementation of mitigation, impacts resulting from the Proposed Action to wetlands and waters of the U.S. would be reduced to less than significant levels.

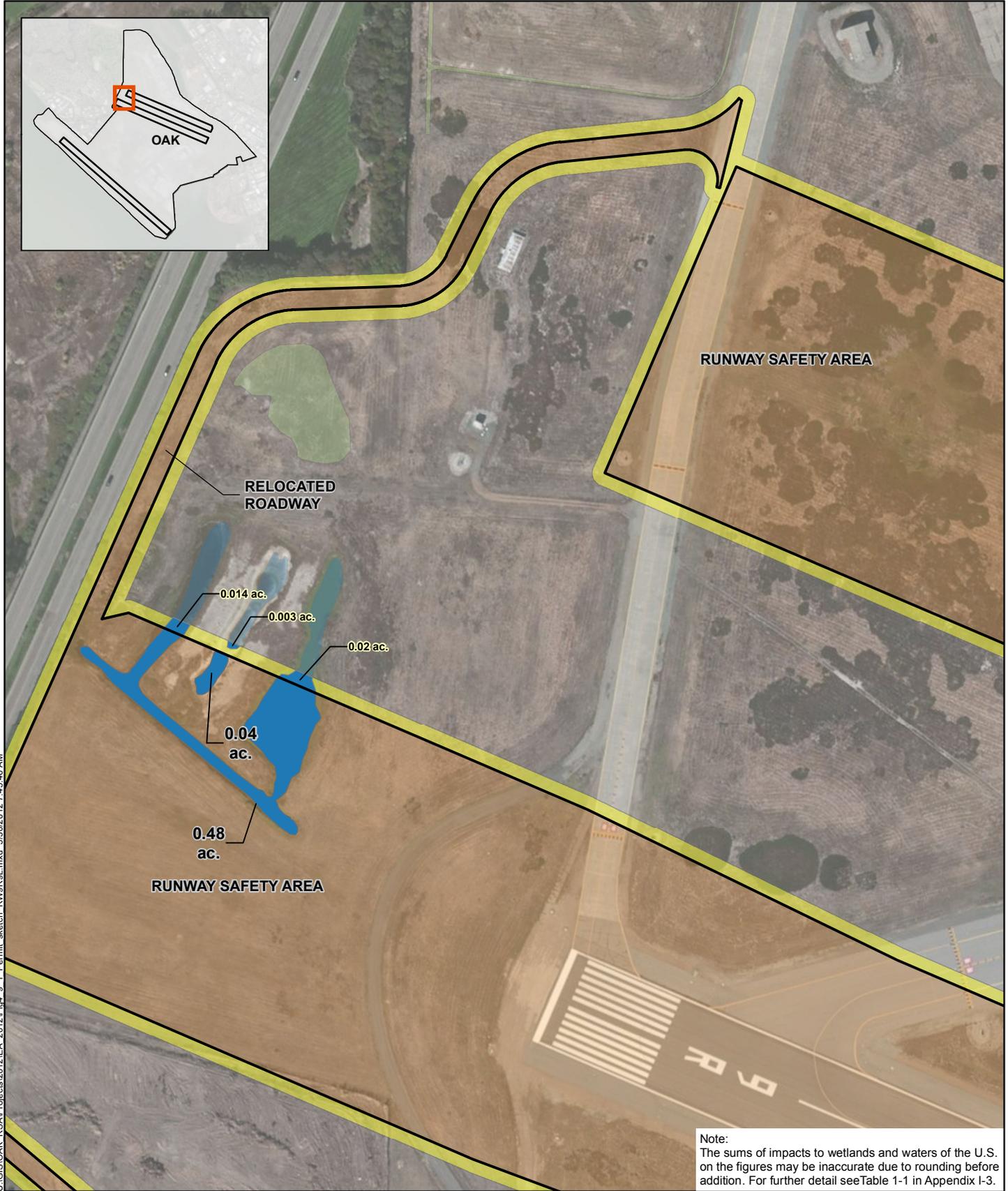
Project Alternative A

Wetlands impacts during construction under Project Alternative A would be the same as those described under the Proposed Action. Construction of the Project Alternative A would have a significant permanent impact on 12.25 acres of non-tidal wetlands, and 2.31 acres of non-tidal waters of the U.S. Also, construction of the Project Alternative A would have a temporary impact on 1.47 acres of non-tidal wetlands, and 0.34 acre of waters of the U.S. However, with implementation of mitigation, impacts resulting from Project Alternative A to wetlands and waters of the U.S. would be reduced to less than significant levels.

4.9.6 AVOIDANCE AND MINIMIZATION MEASURES

Consideration of alternatives to avoid and minimize impacts was undertaken as part of the RSA Improvement Project process; see **Chapter 2, Alternatives**, for a detailed discussion of alternatives considered. The analysis resulted in the three alternatives considered in this EA—the No Action Alternative, the Proposed Action, and Project Alternative A—for their ability to achieve the purpose and need, considering environmental impacts, constructability, and operational issues. As described in **Chapter 2**, there is no practicable alternative available to avoid filling non-tidal wetlands and waters of the U.S. that would fulfill the project purpose of meeting FAA safety design standards.

Project-related non-tidal wetland and waters of the U.S. impacts have been minimized to the extent practicable during the project planning and preliminary design phases and through implementation of BMPs during construction (see **Section 4.8.6**).



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Source: Aerial image, Bing, 2010.

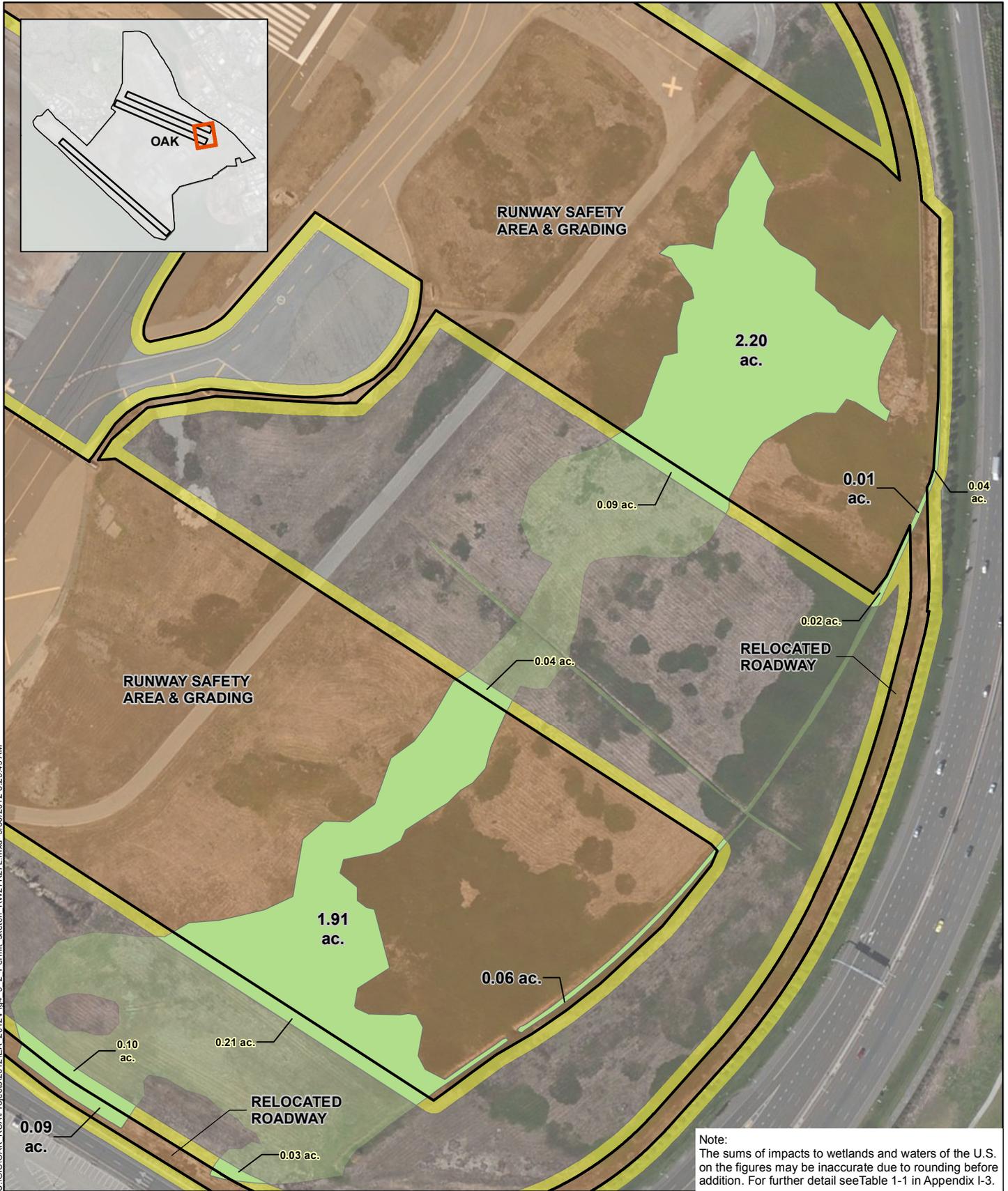
- Extent of Permanent Impacts
- Extent of Temporary Impacts
- Non-Tidal Wetlands
- Non-Tidal Waters of the U.S.



WETLAND IMPACTS - RUNWAY 9R

28067867 Oakland International Airport
Oakland, California

FIGURE 4.9-1

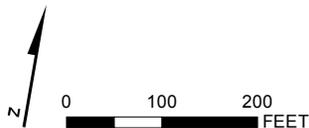


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Source: Aerial image, Bing, 2010.

WETLAND IMPACTS - RUNWAY 27R-27L

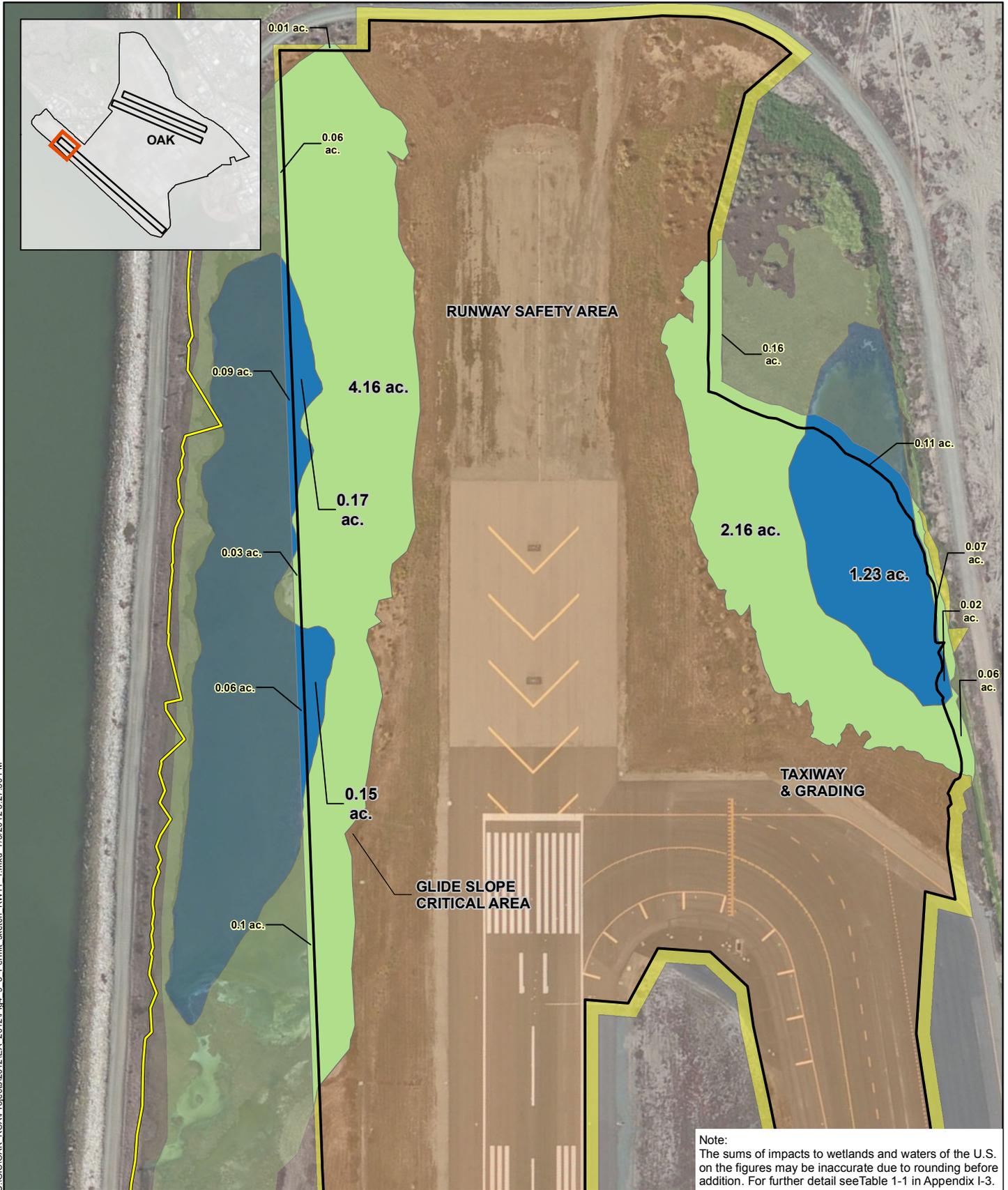
- Extent of Permanent Impacts
- Extent of Temporary Impacts
- Non-Tidal Wetlands



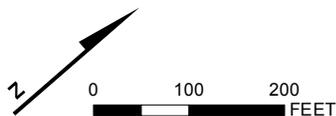
28067867

Oakland International Airport
Oakland, California

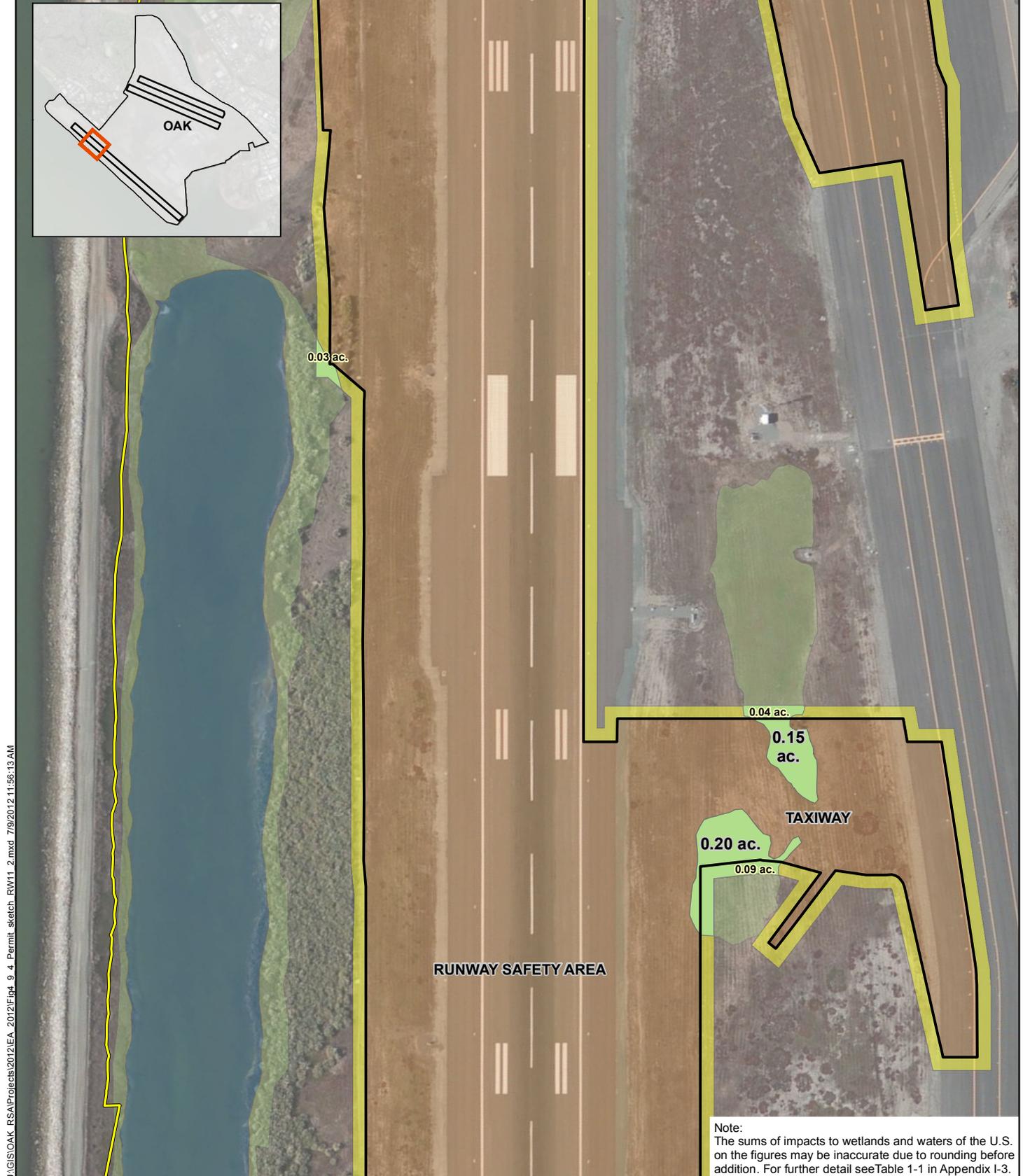
FIGURE 4.9-2



- BCDC Jurisdiction
- Extent of Permanent Impacts
- Extent of Temporary Impacts
- Non-tidal Wetlands
- Non-tidal Other Waters



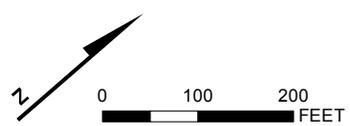
Note:
The sums of impacts to wetlands and waters of the U.S. on the figures may be inaccurate due to rounding before addition. For further detail see Table 1-1 in Appendix I-3.



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Source: Aerial image, Bing, 2010.

- BCDC Jurisdiction
- Extent of Permanent Impacts
- Extent of Temporary Impacts
- Non-tidal Wetlands
- Non-tidal Waters of the U.S.

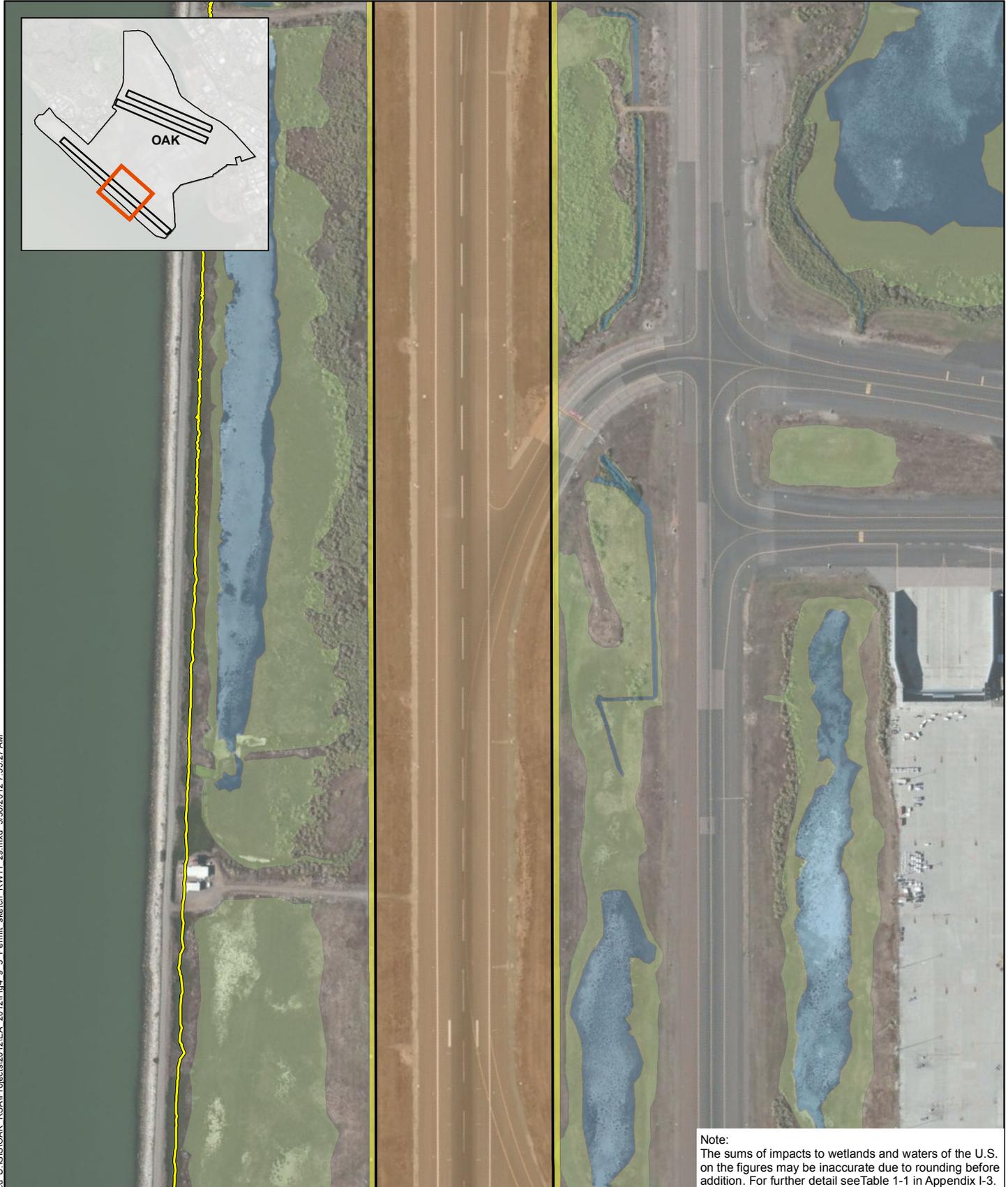


**WETLAND IMPACTS -
RUNWAY 11 (NEW TAXIWAY)**

28067867 Oakland International Airport
Oakland, California

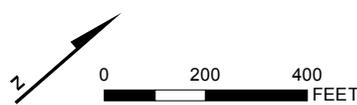
FIGURE 4.9-4

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Source: Aerial image, Bing, 2010.

-  BCDC Jurisdiction
-  Extent of Permanent Impacts
-  Extent of Temporary Impacts
-  Non-tidal Wetlands
-  Non-tidal Other Waters

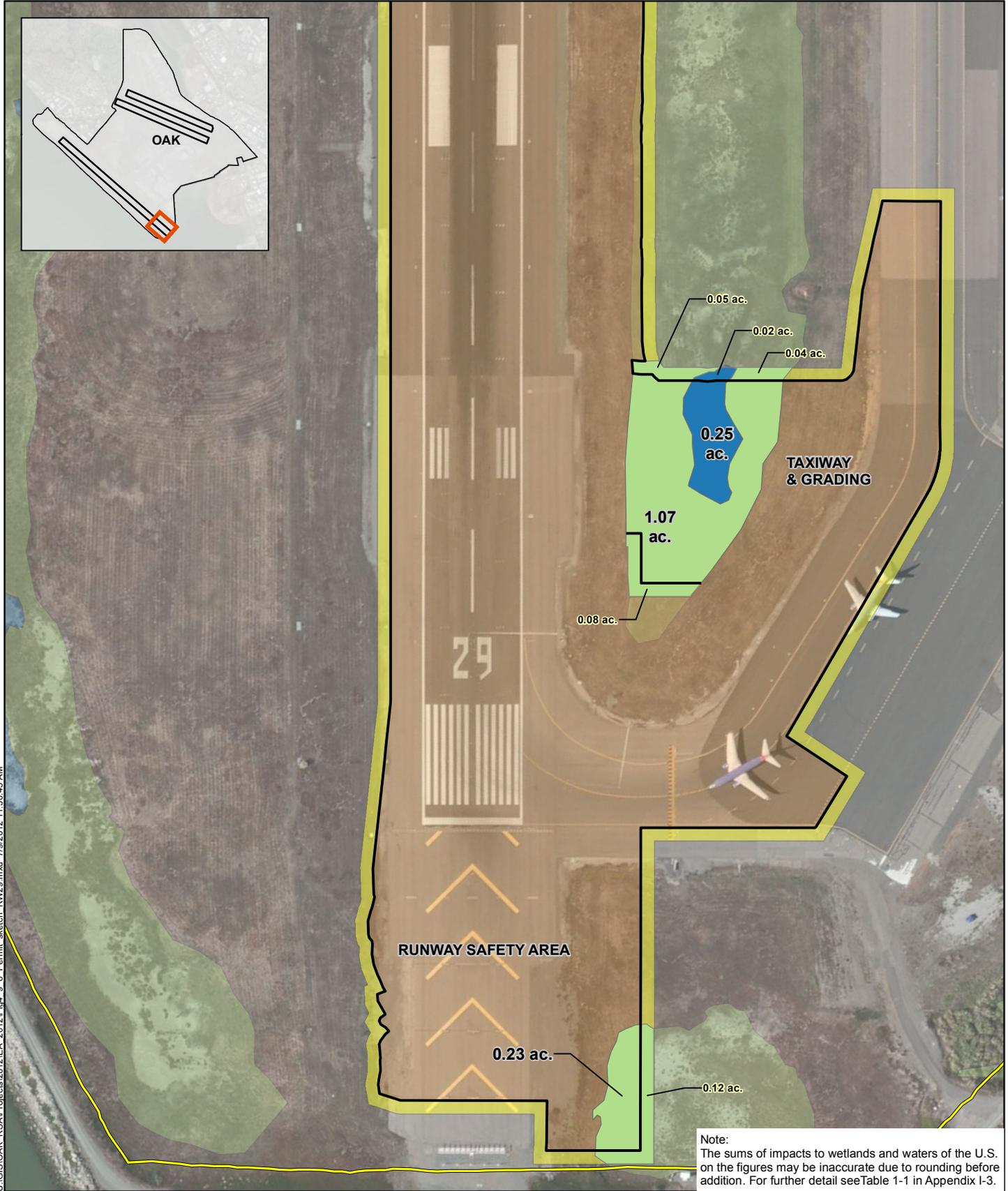


Note:
 The sums of impacts to wetlands and waters of the U.S. on the figures may be inaccurate due to rounding before addition. For further detail see Table 1-1 in Appendix I-3.

WETLAND IMPACTS - RUNWAY 11-29

28067867 Oakland International Airport
Oakland, California

FIGURE 4.9-5

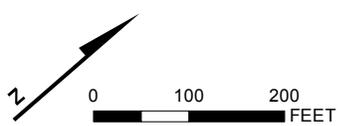


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Source: Aerial image, Bing, 2010.

Note:
The sums of impacts to wetlands and waters of the U.S. on the figures may be inaccurate due to rounding before addition. For further detail see Table 1-1 in Appendix I-3.

- BCDC Jurisdiction
- Extent of Permanent Impacts
- Extent of Temporary Impacts
- Non-tidal Wetlands
- Non-tidal Other Waters



WETLAND IMPACTS - RUNWAY 29

28067867 Oakland International Airport
Oakland, California

FIGURE 4.9-6

Offsite Mitigation

The U.S. EPA and USACE's Wetlands Mitigation Rule (Mitigation Rule)⁴ requires replacement of the loss of wetland acreage and functions from fill of wetlands through compensatory mitigation, but does not allow compensatory mitigation in locations that may create a wildlife-aircraft strike hazard. The Port considered the viability of creating on-site mitigation projects at the Airport; however, FAA regulations prohibit development of compensatory mitigation projects within approximately 2 miles of airport operations (see FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*) (see **Section 4.8.6**).

Accordingly, the Port has developed a proposed offsite compensatory mitigation program to reduce impacts to a non-significant level. This mitigation package will be reviewed and further refined by the regulating resource agencies; in particular, USACE and the San Francisco Bay RWQCB, as part of the respective Section 404 and 401 permitting processes under the Clean Water Act. The Port submitted a permit application to the USACE to comply with Section 404 of the Clean Water Act on March 1, 2012. When the USACE issues the Section 404 permit, the permit conditions will be incorporated into the Final Environmental Assessment. A description of the previous coordination with the USACE and other federal and state agencies, along with associated documentation, is provided in **Appendix E**.

Requirements for Mitigation for Loss to Aquatic Resources

The CWA prohibits the discharge of dredged or fill material into wetlands, streams, and waters of the U.S. unless a Section 404 permit is issued by the USACE, and a Section 401 Water Quality Certification is issued from the state in which the discharge originates (33 USC 1344). Therefore, implementation of the Proposed Action or Project Alternative A would require an individual Section 404 Permit by the USACE San Francisco Bay District, and a Section 401 Water Quality Certification by the San Francisco Bay RWQCB.

Under the guidance of the U.S. EPA and USACE's Wetlands Mitigation Rule⁴ (Mitigation Rule), proposed dischargers are required to replace the loss of wetland acreage and functions by providing compensatory mitigation through aquatic resource restoration, establishment, enhancement, and, in certain circumstances, preservation. The Mitigation Rule encourages the use of mitigation banks to reduce many risks and uncertainties associated with compensatory mitigation. Other options include in-lieu fee programs or permittee-responsible mitigation.

In addition, the proposed mitigation will conform to the RWQCB's San Francisco Bay Region (Region 2) *Water Quality Control Plan (Basin Plan)*, and Fact Sheet for *Reviewing Wetland and Riparian Projects* by the San Francisco Bay Water Board.

Proposed Compensatory Wetland Mitigation

The Port worked with the USACE to identify potential offsite mitigation options to compensate for the permanent loss of 14.56 acres and temporary loss of 1.81 acres of wetlands and waters of the U.S. Potential mitigation sites were evaluated based on the following selection criteria:

⁴ Federal Register, Part II, Department of Defense, Department of the Army, Corps of Engineers, 33 CFR Parts 325 and 332, U.S. EPA 40 CFR Part 230, Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, dated April 10, 2008.

- Schedule Risks (i.e., ability to create wetlands in conjunction with the RSA Improvement Project construction schedule);
- Location (i.e., proximity to the Airport and if the proposed mitigation site is located in the same drainage area as OAK);
- Capacity (i.e., available acreage of wetlands and potential California clapper rail habitat); and
- Ecological functions of the wetlands at the mitigation site.

Before the impact to wetlands and waters of the U.S. would occur, the Port will purchase wetlands and waters of the U.S. mitigation credits from the San Francisco Bay Wetland Mitigation Bank (Bank) at a ratio of 1:1 for in-kind permanent impacts to wetlands and waters of the U.S., at a ratio of 0.1:1 for in-kind temporary impacts to wetlands and waters of the U.S., and at a ratio of 3:1 for waters of the U.S. mitigation credits that are used as out-of-kind mitigation for impacts to wetlands. As described in detail in Table 1-2 of Appendix I-3, the total project impacts will require purchase of 15.134 mitigation bank credits including purchase of 12.200 mitigation bank credits for in-kind impacts to wetlands, purchase of 2.341 mitigation bank credits for in-kind impacts to waters of the U.S., and purchase of 0.593 mitigation bank credits as out-of-kind mitigation for 0.198 acre of wetlands impacts (3:1 ratio). As specified in the USACE communications of January 17, 2012 and Port/USACE/FAA meeting of June 28, 2012, the USACE indicated that these were appropriate mitigation ratios for this project if credits were purchased from this Bank. Use of a wetland mitigation bank to compensate for losses of wetlands habitat is the most highly preferred method of mitigation identified in the USEPA and USACE 2008 Compensatory Mitigation Rule.

The USACE issued an Individual Permit for the Bank on July 30, 2008, which included authorization to restore the Bank property to full tidal action. The framework and language for the establishment, use, operation, maintenance, and long-term management of the Bank is contained in the *San Francisco Bay Wetland Mitigation Bank Enabling Instrument* and associated *Resource Management Plan*, both finalized in March 2011. The Bank Enabling Instrument agreement was entered into by Keech Properties, LLC (Sponsor and Land Manager), USACE, Region 9 of the U.S. EPA, and the Wildlife Heritage Foundation, and fully executed on June 24, 2011.

The Bank property comprises approximately 82.8 acres in northeastern Redwood City, San Mateo County. It is on the edge of San Francisco Bay, bounded by Belmont Slough on the west, Bay Slough on the northeast, Shearwater Parkway on the south, and residential development on the east and south.

Similar to the Port property, the Bank property is within the historic bay margin; it was separated from San Francisco Bay during the early part of the twentieth century by dikes, and drained. The Bank property supported the same jurisdictional features the Port property currently supports, including non-tidal seasonal wetlands and non-tidal open water features.

For several years after the Bank property was diked it was used for production and farming. During the early 1960s, the Bank property was incorporated into Redwood City's General Plan for a marina, residential, and commercial development as part of the Redwood Shores Master Plan. In 2006, Keech Properties, LLC, acquired the Bank property, removed it from development uses, and obtained

entitlements to restore the Bank property to full tidal action in perpetuity as valuable wetlands and waters of the U.S.

Restoration construction activities began in 2009 and continued through 2010. In January 2011, the dike surrounding the property was breached and the Bank property was restored to full tidal action. Since the dike was breached, habitat and aquatic resource functions associated with tidal marsh development have progressed quickly. Historic slough channels have become active, new slough channels are forming, and sedimentation accretion has been observed throughout the Bank.

The Bank Sponsor is responsible for initial design and construction, managing and maintenance, achievement of performance standards, and submitting annual reports for the Bank property, in accordance with the March 2011 *Bank Development Plan: Wetlands Restoration and Success Monitoring* approved by the USACE and U.S. EPA.

The selected mitigation site will achieve the federal and state goal of “no net loss of wetlands.” In addition, the selected mitigation site will enhance the wetland complex in the Bay Area by providing a contiguous area of at least 15.134 acres including 12.200 acres of wetlands and 2.934 acres of waters of the U.S. versus many small, fragmented wetland areas impacted by the OAK RSA Improvement Project. The contiguous area will ensure greater wetland success by allowing vegetation to establish in a larger area, which subsequently enhances and supports wildlife habitat and minimizes predators associated with urban development. Implementation of the mitigation measures would be eligible for funding by a cost share between the FAA (through an Airport Improvement Program grant) and the Port, as part of the overall RSA Improvement Project.

4.10 FLOODPLAINS

4.10.1 OVERVIEW OF IMPACTS

The No Action Alternative would not result in impacts to floodplains. Neither the Proposed Action nor Project Alternative A are located within a 100-year floodplain. Potential impacts are not expected to result in notable adverse impacts on natural and beneficial floodplain values.

4.10.2 METHODOLOGY

Executive Order 11988, Floodplain Management, and the DOT Order 5650.2, “Floodplain 8 Management and Protection,” April 23, 1979, were reviewed to analyze the Proposed Action and Project Alternative A.

Under these orders, the analysis considered any risk to, or resulting from, the action, the impacts on natural and beneficial floodplain values, the degree to which the action provides direct or indirect support for development in the floodplain, and measures to minimize harm or to restore or preserve the natural and beneficial floodplain values affected by the project.

To evaluate potential impacts, the Proposed Action and Project Alternative A were reviewed and compared with floodplain information obtained from the available Flood Insurance Rate Map and other available documents (e.g., Port of Oakland, 1997). In addition, available studies and documents related to sea-level rise predictions were reviewed.

4.10.3 THRESHOLDS OF SIGNIFICANCE

FAA Order 1050.1E, Change 1 (FAA, 2006a), Appendix A, Section 9, describes that floodplain impacts would be significant if the proposed project results in “notable adverse impacts on natural and beneficial floodplain values.” The order identifies a “significant encroachment” of floodplains as one that causes:

- A high probability of loss of human life;
- Substantial encroachment-associated costs or damage (including interrupting aircraft service or loss of a vital transportation facility); or
- Adverse impacts on natural and beneficial floodplain values.

4.10.4 OPERATIONAL IMPACTS

No Action Alternative

The RSA Improvement Project would not occur under the No Action Alternative; therefore, this alternative would not result in impacts to floodplains.

Proposed Action and Project Alternative A

OAK is surrounded by a perimeter dike, and the DSA is not located in Federal Emergency Management Agency-designated 100-year floodplains. All of the RSA improvements would be constructed at or below the existing runway elevation and would involve the placement of fill in approximately 14.56 acres of wetlands and waters of the U.S. No aboveground structures would be constructed within a 100-year floodplain.

None of these construction activities would occur within a designated floodplain. There would be no increase in the base flood elevation in San Francisco Bay, because the flood elevation is based on tides and coastal storm surges. There would be no adverse indirect impacts to beneficial floodplain values.

OAK is surrounded by a perimeter dike that provides flood protection from the surrounding San Francisco Bay and San Leandro Creek. The Proposed Action would not change the level of OAK’s exposure to a potential perimeter dike failure.

4.10.5 CONSTRUCTION IMPACTS

Construction of either the Proposed Action or Project Alternative A would not occur within the 100-year floodplain. Furthermore, construction activities would be temporary and would not impact the base flood elevation for the same reasons as described in **Section 4.10.4, Operational Impacts**.

4.11 COASTAL RESOURCES

4.11.1 OVERVIEW OF IMPACTS

The No Action Alternative would not result in changes to existing conditions at the Airport, and therefore would not result in direct or indirect impacts on coastal resources. The majority of the OAK RSA

Improvement Project improvements associated with the Proposed Action or Project Alternative A are located outside the 100-foot San Francisco Bay Conservation and Development Commission (BCDC) shoreline jurisdictional area. Portions of project-related improvements would fall within the BCDC jurisdictional boundary, and are expected to require the modification of existing Port of Oakland BCDC Permit No. M1989.075 (see **Figure 3.11-1**). These improvements are expected to be consistent with applicable San Francisco Bay Plan (BCDC, 2008) policies, and would not result in significant impacts on coastal resources.

4.11.2 THRESHOLDS OF SIGNIFICANCE

The FAA has not established thresholds of significance for impacts to coastal resources. However, for the purposes of this analysis, a proposed project would have potential for significant coastal zone impacts if it would have an adverse effect on coastal zone resources, or would be inconsistent with an approved coastal zone management program. The applicable approved coastal zone management program for the OAK is the Bay Plan (BCDC, 2008).

4.11.3 OPERATIONAL IMPACTS

No Action Alternative

Under the No Action Alternative, the use of the coastal zone would not change as a result of the OAK RSA Improvement Project, and no impacts to coastal resource would occur.

Proposed Action and Project Alternative A

Public access in the GSA would not change as a result of implementation of the Proposed Action or Project Alternative A. The San Francisco Bay Trail extends along Airport Drive, Doolittle Drive, and Harbor Bay Parkway as an off-street trail, on-street bike lane, and on-street unimproved route, but would not be affected by the Proposed Action or Project Alternative A. Public access is not currently permitted through the BCDC shoreline jurisdictional area on Airport property for safety and security reasons; therefore, there is no public access within the DSA.

Implementation of the Proposed Action would not change aircraft operations or existing activities at the Airport. No significant adverse water quality impacts would result from the Proposed Action because it would not introduce new activities or new pollutants, as described in **Section 4.7, Water Resources**.

4.11.4 CONSTRUCTION IMPACTS

No Action Alternative

Under the No Action Alternative, the use of the coastal zone would not change as a result of the OAK RSA Improvement Project, and no impacts to coastal resource would occur.

Proposed Action and Project Alternative A

The Proposed Action would be constructed outside of BCDC jurisdictional areas, except for the following elements on Runway 11-29:⁵

- A portion of the relocated glide slope antenna, including filling and grading the glide slope antenna critical area;
- Removal of noncompliant wetlands and water bodies in the lateral and runway end;
- Modified surface grades, soil conditions, and signs and navigational aids, including relocation of approach lights at the end of Runway 29 on the existing trestle structure.

The Bay Plan designates OAK as an Airport Priority Use Area, and as such, allows for BCDC approval of shoreline development and filling permits in accordance with standards for the use of the shoreline. As described in **Chapter 2, Alternatives**, the Proposed Action, compared to other alternatives considered, would eliminate the need for San Francisco Bay fill through the use of declared distances. This is consistent with Bay Plan policies related to fill, because it would provide for the minimum filling necessary to achieve the project purpose. As described in **Section 4.9**, the Port would implement offsite mitigation to offset the permanent impacts of non-tidal wetlands and non-tidal waters of the U.S. The Proposed Action would be constructed in compliance with applicable water quality requirements and a SWPPP, which would identify construction BMPs to minimize water quality impacts on San Francisco Bay as described in **Section 4.7, Water Resources**. Implementation of the RSA Improvement Project would be in compliance with the Bay Plan.

As described in **Section 4.13, Light Emissions and Visual Character**, the OAK RSA Improvement Project would be constructed at approximately the same elevation as the existing runway elevation, and would not significantly alter existing views of the Airport.

Because potential construction-related environmental impacts from the Proposed Action would not be significant and are expected to be consistent with the policies in the Bay Plan, no significant impacts on coastal resources would occur.

4.11.5 MITIGATION

With implementation of the mitigation measures for impacts to wetlands and other waters of the U.S. summarized above and described in detail in **Section 4.9**, neither the Proposed Project nor Project Alternative A would result in significant impacts to coastal resources and no additional mitigation measures beyond those described in **Section 4.9** are required.

⁵ For detailed illustrations of impacted BCDC jurisdiction areas see the following figures: **3.11-1, 4.9-3, 4.9-4, 4.9-5** and **4.9-6**.

4.12 HISTORIC ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

4.12.1 OVERVIEW OF IMPACTS

During the development of this EA, the FAA consulted with the State Historic Preservation Officer (SHPO) as part of the concurrent NEPA and Section 106 processes. In a letter dated December 29, 2011, the FAA determined the Area of Potential Effects (APE) (see **Appendix F, Cultural Resource Consultation**) and provided its finding of no effect of the Proposed Action on historic properties. The California State Historic Preservation Office concurred with the FAA's determination of no effect by letter of February 6, 2012, which completes the FAA's consultation requirements under the National Historic Preservation Act, Section 106, and 36 CFR Part 800.

The FAA has determined there are no historic properties listed or eligible for listing on the National Register of Historic Places within the APE. The FAA has found the Proposed Action, Project Alternative A and the No Action Alternative would not affect any historic properties listed or eligible for listing on the National Register of Historic Places within the APE.

4.12.2 THRESHOLDS OF SIGNIFICANCE

The four evaluation criteria to determine a resource's eligibility to the National Register of Historic Place (NRHP), in accordance with the regulations outlined in 36 CFR Part 800, are identified at 36 CFR § 60.4. These evaluation criteria, listed below, are used to help determine what properties should be considered for protection from destruction or impairment resulting from project-related activities (36 CFR § 60.2).

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- (a) Resources that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) Resources that are associated with the lives of persons significant in our past; or
- (c) Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) Resources that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR § 60.4).

4.12.3 OPERATIONAL AND CONSTRUCTION IMPACTS

No Action Alternative

Under the No Action Alternative, the proposed OAK RSA Improvement Project would not be constructed. As such, no impacts on known historic properties would occur under the No Action Alternative.

Proposed Action and Project Alternative A

As discussed above, no historic properties that are listed on, or eligible for, the NRHP have been identified in the OAK RSA APE. Therefore, there would be no effect on historic properties on or eligible for the NRHP as a result of the impacts of the Proposed Project or Alternative A. Because the Proposed Project or Project Alternative A would not affect the number or type of aircraft using the Airport, there would be no change in the indirect effects of aircraft noise resulting from the Proposed Project or Project Alternative A. Additionally, neither the Proposed Project nor Project Alternative A would cause a noticeable change in the visual appearance or context of the area. The California SHPO has concurred with FAA's determination of eligibility and findings of effect by letter dated February 6, 2012 (see **Appendix F**).

In the event an unanticipated discovery of previously unidentified archaeological resources is made during construction of the proposed undertaking, the FAA and the Port will require the construction activities in the vicinity of the discovery to stop and take all reasonable measures to avoid or minimize harm to the property until the FAA and the Port conclude consultation with the California SHPO. The inadvertent exposure of intact archaeological deposits is not anticipated, given the history of artificial fill and soil deposition at OAK.

In the event that an artifact is discovered during earthmoving activities, work will be temporarily suspended in the immediate vicinity of the artifact in order for the archaeological monitor to determine if further investigation is necessary. In the event any human remains are discovered the following procedures will be used:

- A. In the event that suspected human remains are discovered, the archaeological field director or the Lead Environmental Inspector (LEI) will stop excavation immediately and notify their supervisors immediately. No bones or associated artifacts will be removed until further notice from these supervisors. A reasonable effort will be made to protect human remains from further damage or intrusion.
- B. The supervisor(s) will direct that all ground disturbing activity within 100 feet of the find be stopped until notified in writing that work can recommence. The area of the remains will be clearly marked with flagging or safety fencing and guarded as needed.
- C. The field supervisor(s) will immediately notify the FAA Project Manager and Port (during construction, restoration, and remediation). The LEI during construction also will be notified to oversee stop-work actions in the find area. The appropriate Project Manager/or Port designated Contractor in Charge (CIC) will direct the Archaeological Monitor to evaluate the find. The Archaeological Monitor will complete on-ground evaluation of the find within 24 hours of notification.
- D. If the human remains are not obviously prehistoric in nature (e.g., in direct association with prehistoric artifacts), the Archaeological Monitor or LEI will report the burial to the Alameda County Sheriff's Department Dispatch office so the Alameda County coroner or other officer can inspect the site and determine if a criminal investigation is necessary.

- E. The Archaeological Monitor or LEI will report the discovery to the FAA, and Port's CIC. The Port will report to the discovery to the California SHPO (Mr. Tristan Tozer, Telephone 916.445.7027) concurrently with notification of law enforcement officials. If the Archaeological Monitor cannot make a reasonable assessment of the discovery, then a physical anthropologist or bio-archaeologist will be called in to identify whether the remains could be of Native American or other ancestry. This may involve uncovering the skeleton if the necessary measurements cannot be taken in the field. It also may be necessary to expand the excavation to facilitate viewing the skeleton in situ and determine the context. Full excavation and/or removal of the remains will not occur until the appropriate Native American representatives are notified and have had an opportunity to comment. Removal and reburial or other appropriate treatment options will be discussed with the appropriate Native American representatives. Any field methodology proposed will be conducted in consultation the California SHPO. Tables of skeletal attributes, and/or computer programs such as FORDISC, should be consulted to compare the skeletal measurements with existing human populations. If the measurements match those for Native American populations, or if there is doubt as to ancestry, they will be assumed to be Native American. Human remains found within prehistoric contexts will be assumed to be Native American, unless skeletal or site information strongly suggests otherwise.
- F. For Native American remains, the FAA, in consultation with the California SHPO, will notify the designated Tribal monitor(s) as soon as a determination is made.

The FAA will require the Port implement the measures identified in consultation with the SHPO through Airport Improvement Program grant assurances or similar requirements to ensure that these measures are implemented. The FAA and the Port will be responsible for restricting all construction activity from the immediate vicinity of the human remains until a burial treatment plan is implemented. The Port's Emergency Plan of Action for Discoveries of Unknown Historic or Archaeological Resources (URS, 2000) will also be implemented. With implementation of these measures, the proposed action's impacts on historic properties would be less than significant.

Tribal Coordination

The FAA has communicated with all the Native American individuals and organizations identified by the California Native American Heritage Commission as potentially having knowledge of cultural resources in the area. The FAA, by letter of June 13, 2011, requested that the tribal organizations provide any comments or concerns regarding the proposed project. No comments were received.

4.13 LIGHT EMISSIONS AND VISUAL CHARACTER

4.13.1 OVERVIEW OF IMPACTS

The No Action Alternative would not result in light emission or visual impacts. The Proposed Action would involve minor modifications to existing airfield lighting, and is likely to involve nighttime construction. However, no significant light emission impacts on light-sensitive areas (e.g., residential areas) are expected. The potential effect on the visual landscape would be minimal with the implementation of the Proposed Action or Project Alternative A because the RSA Improvement Project would be at-grade and within existing Airport property.

4.13.2 METHODOLOGY

Light emission impacts associated with the No Action Alternative, the Proposed Action, and Project Alternative A were determined by evaluating the extent to which airfield lighting would change, and the potential for the change to create a nuisance to light-sensitive areas in the vicinity of the Airport.

Evaluation of visual impacts considered the potential changes in landscape and views in the vicinity of the Airport.

4.13.3 THRESHOLDS OF SIGNIFICANCE

Due to the subjective nature of these impacts, thresholds to determine the significance of lighting and visual impacts have not been established by the FAA. For this EA, and pursuant to the FAA Order 5050.4B, a light emission impact would occur when an action's light emissions create annoyance to or interfere with normal activities. A visual impact would occur if consultation with federal, state, local agencies, tribes, or the public shows that visual effects contrast with existing environment, and the effect is determined to be objectionable.

4.13.4 OPERATIONAL IMPACTS

No Action Alternative

Because the No Action Alternative does not involve changes to lighting or the appearance of existing facilities at the Airport, no light emissions or visual impacts would occur.

Proposed Action and Project Alternative A

The Proposed Action and Project Alternative A would require the relocation of runway and taxiway lights and signage, and modification to existing navigation aids. However, these modifications to the existing lighting system are all at-grade, and would not result in additional glare-inducing features. Replaced and shifted MALSR approach lights and relocated Approach Lighting System with Sequenced Flashing Configuration 2 would not add to the Airport lighting, and therefore would not create a nuisance in the vicinity or interfere with activities during the day or night.

The RSA Improvement Project would be located within the existing airfield and would not alter existing views of the Airport. No significant contrast between the No Action Alternative, the Proposed Action, or Project Alternative A would be visible from surrounding areas, and therefore, no visual impacts would occur.

4.13.5 CONSTRUCTION IMPACTS

Construction activities are anticipated to occur between 2013 and 2015, and may require nighttime lighting. Construction lighting would be located within the vicinity of existing runways and would be directed so that it would not introduce significant additional glare or create a nuisance to light-sensitive areas in the vicinity of OAK. Existing views of the Airport would not change significantly during construction as a result of the equipment used or temporary construction facilities or structures erected on the airfield. Therefore, no significant light or visual emission construction impacts would occur.

4.14 NATURAL RESOURCES AND ENERGY SUPPLY AND SUSTAINABLE DESIGN

4.14.1 OVERVIEW OF IMPACTS

Neither the No Action Alternative, the Proposed Action, nor Project Alternative A would significantly impact natural resources that are unusual in nature or are in short supply. Neither the Proposed Action or Project Alternative A would increase aircraft operations or alter the use of the Airport when compared to the No Action Alternative. Therefore, the energy, fuel, and natural gas demands at OAK are not expected to change significantly with the implementation of the Proposed Action or Project Alternative A. OAK has implemented a number of plans and programs to promote sustainable design in the areas of air quality, waste reduction and recycling, energy conservation and renewable energy, and climate change. These programs would continue under the No Action Alternative, Proposed Action, or Project Alternative A.

4.14.2 METHODOLOGY

Natural resources, energy supply, and sustainable design impacts associated with the No Action Alternative, the Proposed Action, and Project Alternative A were determined by evaluating the extent to which airfield electrical, fuel, and water demands would change, and assessing the change in consumption of natural resources.

4.14.3 THRESHOLDS OF SIGNIFICANCE

FAA Order 1050.1E (FAA, 2006a), Appendix A, does not identify specific impact thresholds for energy and natural resources.

4.14.4 OPERATIONAL IMPACTS

No Action Alternative

Natural Resources

The No Action Alternative would not use or impact natural resources and minerals that are unusual in nature or are in short supply in the GSA. Under the No Action Alternative, changes in the RSA Improvement Project would not occur and no stormwater drainage facilities would be constructed or expanded, and water demand would not change.

Energy Supply

Under the No Action Alternative, no changes would occur to increase or decrease the existing aviation activity at the Airport. The Airport would continue operations, and therefore no additional fuel or energy consumption would occur. Fuel consumption is not anticipated to increase significantly, because its use would be equal with forecasted changes in growth at OAK.

Proposed Action and Project Alternative A

Natural Resources

Implementation of the Proposed Action or Project Alternative A would not use or impact natural resources and minerals that are unusual in nature or are in short supply. The OAK RSA Improvement Project is not a capacity-enhancing project, and would not result in any associated increase or decrease in aviation activity at the Airport. Implementation of the Proposed Action or Project Alternative A is not anticipated to increase water consumption and wastewater generation at OAK.

Energy Supply

Because the Proposed Action or Project Alternative A would not change aviation activity or number of aircraft operations, or alter the use of the Airport when compared to the No Action Alternative, energy demands at OAK are not expected to result in increases in use of electricity, gas, or fuel during operations.

4.14.5 CONSTRUCTION IMPACTS

No Action Alternative

Under the No Action Alternative, there would be no change to natural resources and energy supply and sustainable design. Therefore, there would be no impacts related to construction.

Proposed Action and Project Alternative A

Natural Resources

Construction of the Proposed Action or Project Alternative A would use common building materials such as asphalt and concrete for runways, taxiways, service roads, and EMAS installations, and soil for grading portions of the RSAs. These materials are considered widely available in the Bay Area.

Construction activities could result in temporary increases in water demand. However, construction-related uses of water would be minor compared to the overall Airport water demand, and the temporary increase in demand could be served through existing entitlements and resources.

The Proposed Action or Project Alternative A would modify portions of the existing storm drain system and may include new catch basins, pipe, and swales coincident with the grading and earthwork activities. As described in **Section 4.7**, neither the Proposed Action nor Project Alternative A would result in significant impact to water resources.

Energy Supply

Fuel and energy would be used by construction workers' vehicles and equipment during construction of the Proposed Action or Project Alternative A. However, it is not anticipated that the amount of energy and fuel needed to implement the Proposed Action or Project Alternative A would substantially impact supply, and BMPs would be implemented to ensure these resources are not used in a wasteful manner.

4.15 HAZARDOUS MATERIALS, POLLUTION PREVENTION AND SOLID WASTE

4.15.1 OVERVIEW OF IMPACTS

The Proposed Action and Project Alternative A include grading and drainage improvements, relocation of existing airfield service roadways, and construction of EMAS. The majority of the construction is likely to involve relatively shallow grading and removal of existing surface material (i.e., concrete and asphalt) to prepare for the new surface. Contaminated soil and groundwater may be encountered during some of these construction activities; however, construction plans and specifications would include provisions for the handling, storage, treatment and/or testing and disposal of any contaminated materials. During construction, fuel, oil, and other petroleum-based products would also be used and stored; however, construction plans would include provisions for appropriate handling of these materials. The use of fuel, oil, and other petroleum-based products necessary for the routine operation of OAK would continue, and is not anticipated to increase as a result of implementation of the Proposed Action or Project Alternative A because aircraft operations would not increase. Implementation of BMPs in the form of avoidance and minimization measures would further reduce potential impacts.

Construction contractors and workers would generate what can be characterized as traditional municipal solid wastes during construction. These wastes may include paper and other wastes usually associated with office and administrative activities. The waste stream may also include wastes from individual workers at the job site (i.e., newspapers, food wrappers, disposable cups). The volume of this municipal solid waste (MSW) is expected to vary during the course of the construction phase of either the Proposed Action or Project Alternative A, and would produce a relatively small volume of waste. The landfills that service OAK and Alameda County would be capable of accommodating the volume of MSW generated by passenger enplanements; therefore, mitigation for MSW would not be required.

There are no landfills within 10,000 feet of any runway or within a 5-mile radius of OAK. The Proposed Action and Project Alternative A are consistent with the recommended guidance provided in FAA AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*.

4.15.2 METHODOLOGY

Hazardous Materials. For the purpose of this analysis, locations of facilities that involve hazardous materials and sites of known or potential environmental contamination, located within the OAK boundary or within 0.25 mile of the DSA, were identified (see **Figure 3.15-1**). This information was then compared to the areas of the Airport that would be disturbed by construction and demolition activities associated with the No Action Alternative, the Proposed Action, and Project Alternative A, as shown in **Figure 3.15-1**.

In addition, the intended function and operation of the Proposed Action and Project Alternative A were considered from the standpoint of hazardous materials involvement. This information enables a better understanding of the use, storage, and disposal of these substances. Sampling and testing of environmental media (e.g., soils, surface/groundwater, building materials) was not conducted.

Relevant safeguards, or precautions, undertaken to help avoid or minimize the potential environmental impacts associated with hazardous materials and/or environmental contamination during both the

construction and operational phases of the project were also evaluated. Finally, the project's overall compliance with current federal, state, and local criteria for evaluating the effects of hazardous materials under the NEPA process was addressed (see **Appendix I, Table 2**).

Solid Waste. The No Action Alternative, Proposed Action, and Project Alternative A were evaluated for the potential to result in impacts associated with the generation and/or disposal of MSW. Specifically, the evaluation included MSW impacts from:

- Demolition and construction activities;
- Future enplanements at OAK; and
- Compliance with the guidelines contained in the FAA's AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*.

The potential for temporary generation of solid wastes due to demolition and construction activities was based on the type of construction activities associated with the RSA Improvement Project. According to FAA AC 150/5200-33B, waste disposal sites having the potential to attract birds are considered incompatible if located within 10,000 feet (1.9 statute miles) of any runway used or planned to be used by turbine-powered aircraft, or located within a 5-mile radius of a runway that attracts or sustains hazardous bird movements into or across the runways and/or approach and departure patterns of aircraft.

4.15.3 THRESHOLDS OF SIGNIFICANCE

FAA Order 1050.1E, Appendix A, Section 10 provides guidance on the federal framework required for potentially impacting hazardous materials. If an action involves acquiring property on an National Priorities List site, by definition, it normally is considered a major action with significant impacts. The cost and feasibility of any necessary remediation of hazardous waste contamination should also be considered.

The EA considered whether an alternative under consideration would cause any of the following conditions:

- Project-generated solid waste would exceed available landfill or incineration capacities, or require extraordinary effort to meet applicable solid waste permit conditions or regulations;
- Local, state, or federal agencies determine that substantial unresolved waste disposal issues exist and may require more analyses.

4.15.4 OPERATIONAL IMPACTS

Operation activities as a result of implementing the Proposed Action or Project Alternative A would be the same as the future (2015 and 2020) No Action Alternative at OAK. The Airport would continue to implement existing BMPs to reduce and comply with applicable regulatory measures to avoid incidental release of hazardous materials and to appropriately dispose of hazardous wastes. Therefore, neither the Proposed Action nor Project Alternative A (in 2015 or 2020) would result in significant impacts related to hazardous materials or hazardous waste when compared to the No Action Alternative.

Also, based on future aircraft operations at OAK being equal to the No Action Alternative, the volume of solid waste generated due to passenger enplanements would be the same for the Proposed Action and Project Alternative A. The landfills that service OAK and Alameda County would be capable of accommodating the volume of MSW generated by future passenger enplanements; therefore, mitigation for MSW would not be required.

There are no landfills within 10,000 feet of any runway or within a 5-mile radius of OAK. The Proposed Action and Project Alternative A are consistent with the recommended guidance provided in FAA AC 150/5200-33B.

4.15.5 CONSTRUCTION IMPACTS

No Action Alternative

The No Action Alternative was analyzed in this EA for comparative purposes with existing conditions and to disclose any potential environmental impacts without implementation of the Proposed Action or Project Alternative A. No ground disturbance or alteration/demolition activities would occur with the No Action Alternative. As such, the No Action Alternative would not disturb known or potential hazardous materials or waste sites. Therefore, no hazardous material or solid waste (e.g., construction waste) impacts would occur.

Proposed Action and Project Alternative A

Hazardous Materials

The Proposed Action and Project Alternative A include grading and drainage improvements, relocation of existing airfield service roadways, and construction of EMAS. The majority of the construction is likely to involve relatively shallow grading and removal of existing surface material (i.e., concrete and asphalt) to prepare for the new surface.

During the construction period of either the Proposed Action or Project Alternative A (2013 to 2015), construction contractor staging areas would be located in various locations on the Airport. The number and size of the staging areas would vary widely depending on the requirements and timing of the individual construction of RSA improvements. These sites would likely include portable aboveground storage tanks and other temporary facilities for the storage of fuel and petroleum-based products for the various construction equipment: excavators, haul trucks, graders, pavers, forklifts, compactors, and bulldozers. As described in **Section 4.7**, the contractor(s) would be required to prepare a project-specific SWPPP documenting the measures that would be taken to prevent accidental release to the environment and, should they occur, the corrective actions that would be in place to minimize the environmental impacts.

The servicing of heavy construction equipment would require the storage and dispensing of oil, gasoline, greases, and solvents. Therefore, maintenance and repair of such equipment would be confined to areas specifically designed for that purpose, such as the construction contractor's staging area. When equipment servicing is not conducted in these designated areas, special care would be taken to ensure that these potential pollutants do not wash into surface water drainage channels. All construction would

be in compliance with the project-specific SWPPP developed by the contractor prior to the initiation of construction.

Construction activity associated with the Proposed Project would mostly involve removal of existing surface material (i.e., concrete and asphalt) to prepare the new surface, and relatively shallow excavations. Typical excavation depths would be up to approximately 4 feet. Previous studies have indicated that groundwater occurs within 1 foot of the ground surface. As shown on **Figure 3.15-1** and summarized in **Section 3.15.3**, hazardous materials sites could result in hazardous subsurface conditions that are generally located within, or in proximity of, the RSA Improvement Project at OAK. Potential construction impacts associated with the Proposed Action or Project Alternative A may include the possibility of encountering soil and/or groundwater contamination in select areas, and the handling of hazardous materials typically associated with construction.

The Port would implement the avoidance and minimization measures described below and would ensure that the contractor follows the Port of Oakland Contract Project Manual – Section 01340 that requires the submittal of a soil and groundwater management plan for the handling, storage, treatment, and/or testing of contaminated soil and/or groundwater. Additionally, the Port would ensure that the contractor pre-arranges for dewatering, water testing, storage, and treatment in compliance with applicable permits, depending on the discharge point and the nature of any contamination encountered, and create a plan for emergency cleanup of any spills of fuel or other materials.

With the compliance with relevant guidelines and regulations and implementation of the minimization and avoidance measures, the potential for impacts related to hazardous materials handling and potentially contaminated soil and/or groundwater would not be significant.

In the event that existing cleanup sites or previously unknown contaminants are discovered during construction, or a spill occurs during construction, construction contract provisions would specify that work would stop until the National Response Center is notified. Depending on the parameters of potential soil contamination, the soil could be reused on site. If the soil could not be used on site, the soil would be manifested and transported off site to an authorized disposal facility.

Solid Waste

Although specific quantities of construction wastes have not been estimated (because final project design plans have not been prepared), waste generated may include excavated material such as concrete, asphalt, and soil. Construction waste and excess soil would be marginal compared to the daily disposal volumes for the landfills that serve OAK and Alameda County. Clean soil and other suitable waste could be reused as fill material, buried, or taken to the Port's material management site located in North Field off Ron Cowan Parkway. All other material would be disposed of at permitted solid waste landfills, construction/debris landfills, and vegetative waste facilities.

Construction contractors and workers would generate what can be characterized as traditional municipal solid wastes during construction. These wastes may include paper and other wastes usually associated with office and administrative activities. The waste stream may also include wastes from individual workers at the job site (i.e., newspapers, food wrappers, disposable cups). The volume of this waste stream is

expected to vary during the course of the construction phase and would produce a relatively small volume of wastes. The Port would encourage contractors to implement a recycling program that could substantially reduce the amount of the construction-related municipal solid wastes to be placed in a landfill.

Construction waste not diverted, recycled, or reused would be transported to and disposed in local, permitted construction/demolition facilities or in local waste-to-energy plants, in accordance with applicable state and local requirements. No substantial construction-related solid waste impacts are anticipated.

4.15.6 MITIGATION

Avoidance and Minimization Measures

The following avoidance and minimization measures would be implemented to reduce the potential temporary construction impacts associated with hazardous materials and/or environmental contamination:

- **Documentation.** During the construction phases, hazardous materials (i.e., fuel, waste oil, solvents, paint, and other hydrocarbon-based products) would be used in quantities that are typical of the construction industry. The construction contract documents should require that these materials be stored, labeled, and disposed of in accordance with federal, state, and local regulations. The contractors would be held responsible for immediately reporting any discharges of hazardous materials or other similar substances (in amounts above their reportable quantities) to the Port. If threshold limits are exceeded for fuel storage, a spill prevention control and countermeasures plan may be required for the storage of flammable fuel hydrocarbons at the site.
- **Contaminated Soil and Groundwater.** For any locations where environmental contamination could be encountered during the construction phase, the contractor's construction plans and specifications would include provisions for the handling, storage, treatment, and/or testing and disposal of petroleum-contaminated soil and water. These provisions may include the excavation and offsite disposal or potential testing and reuse of impacted soil on site beneath sealed surfaces.
- **Dewatering.** For locations requiring dewatering where environmental contamination could be encountered during the construction phase, or where accumulated stormwater or groundwater is impacting construction activities, the contractor would coordinate with the Port for dewatering water testing, storage, and treatment.
- **Asbestos Material.** If demolition of any existing structures other than concrete and asphalt are proposed that are known, or suspected, to have asbestos-containing materials, the contractor's demolition plans and specifications would include requirements for the testing, handling, removal, and disposal of these materials in accordance with federal, state, and local regulations.
- **Waste Disposal Schedule.** The generation of demolition and construction debris would be closely phased with construction activities, and therefore would not occur all at once. This would allow the waste product to be disposed of in an orderly, planned fashion that would reduce the overall impact to the local and regional landfills. Recycled materials (concrete and asphalt) could be reused on Airport projects associated with the RSA Improvement Project.

4.16 CUMULATIVE IMPACTS

A cumulative impact is the environmental effect resulting from the incremental effects of a project when added to the effects of past, other present, and reasonably foreseeable future actions, regardless of the entity (i.e., federal or non-federal) or person that would carry out those actions. In some cases, individually minor but collectively significant actions occurring over a defined period of time can cause cumulative impacts. The projects considered in the assessment of potential cumulative impacts for this EA in addition to the Proposed Action are identified in **Section 3.16**.

4.16.1 METHODOLOGY

The actions that meet the criteria described in **Section 3.16**, and which were considered in the assessment of potential cumulative impacts for this EA, are identified in **Section 3.16**. The GSA was used to define the spatial boundary. Projects in the planning phase cannot provide enough data to ensure complete analysis. As such, a qualitative evaluation of the potential environmental impacts associated with these projects has been conducted. The analysis incorporates information and lessons learned from other studies and projects nationwide. Based on these other studies, the severity of potential impacts resulting from the cumulative projects was given a subjective ranking between 1 and 4. These rankings are as follows:

Ranking	Description
1	Environmental impacts would not occur to this resource category as a result of <u>either</u> the Proposed Action <u>or</u> the cumulative project.
2	Potential minor environmental impacts could occur to this resource category as a result of <u>either</u> the Proposed Action <u>or</u> the cumulative project. These projects would not result in a cumulative impact when added together.
3	Potential minor environmental impacts could occur as a result of <u>both</u> the Proposed Action and the cumulative project; the cumulative impact could be significant when these projects are added together.
4	Potential significant impacts could occur as a result of the Proposed Action <u>and</u> the cumulative projects, and the cumulative impact would be potentially significant.

Table 4.16-1 provides a summary of the impact analysis for the cumulative projects. When interpreting the ranking information in this table, consideration should be given to the fact that projects listed are primarily in the early development phase. As such, planners developing these projects have the opportunity and would likely incorporate design features to minimize and mitigate many of the potential impacts that have been identified.

4.16.2 OPERATIONAL AND CONSTRUCTION IMPACTS

As indicated in **Table 4.16-1**, past, present, and reasonably foreseeable development projects in the GSA have had impacts on, and have the potential to independently impact, a number of the resource categories evaluated in this EA, such as water quality, biotic communities, air quality, wetlands, and noise. The limited impacts of the Proposed Action would be mitigated to the fullest extent practicable

through the implementation of on-site avoidance and minimization measures and offsite mitigation measures discussed in this EA. Therefore, the Proposed Action is not projected to have any significant cumulative impacts on any of the resource categories. The projected impacts of Project Alternative A are very similar to those of the Proposed Action. Thus, when considered in addition to other development projects⁶, neither the Proposed Action nor Project Alternative A is expected to lead to significant cumulative impacts.

⁶ Offsite projects listed in Section 3.16.2 were considered in this analysis but did not have any cumulative impacts.

**Table 4.16-1
Potential Cumulative Impacts**

	Project Name	Air Quality	Coastal Resources	Compatible Land Use	DOT Section 4(f)	Fish, Wildlife, and Plants	Floodplains	Hazardous Materials, Pollution Prevention, and Solid Waste	Historic Architectural, Archaeological, and Cultural	Light Emission and Visual Character	Natural Resources/Energy	Noise	Socioeconomics, Environmental Justice, and Children's Health	Water Resources	Wetlands
PAST (2005-2010)	North Field Airfield Improvements	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	Terminal Improvements	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	South Field Airfield Improvements	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	Remain Overnight Parking	2	1	1	1	2	2	2	2	2	2	2	1	2	2
PRESENT (2011)	Replacement of Airport Traffic Control Tower	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	Terminal Improvements	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	North Field Airfield Improvements	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	FedEx														
	Stormwater System Rehabilitation	2	1	1	1	3	2	2	2	2	2	2	1	3	3
Oakland Fuel Farm Facilities															
FUTURE (2012-2016)	North Field Airfield Improvements	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	South Field Taxiway and Runway Reconstruction	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	Curbside Improvements	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	Utility Program Upgrade	2	1	1	1	2	2	2	2	2	2	2	1	2	2
	Pump House No. 6	2	1	1	1	2	2	2	2	2	2	2	1	3	2
	South Field Perimeter Dike Improvement Project	2	2	1	1	3	2	3	2	2	2	2	1	2	3
	Bike Path Improvements	2	1	1	1	2	2	2	2	2	2	2	2	1	2

Key to Table:

- 1 = No impacts would occur to this resource category as a result of **either** the Proposed Action **or** the cumulative project.
- 2 = Potential minor environmental impacts could occur to this resource category as a result of either the Proposed Action or the cumulative project; these projects would not result in a cumulative impact when added together.
- 3 = Potential minor environmental impacts could occur as a result of both the Proposed Action and the cumulative project; the cumulative impact could be significant when these projects are added together.
- 4 = Potential significant impacts could occur as a result of the Proposed Action and the cumulative projects, and the cumulative impact would be potentially significant.

Note:

DOT = U.S Department of Transportation