
FINAL ENVIRONMENTAL ASSESSMENT

Proposed Runway Safety Enhancement Project

Hayward Executive Airport
City of Hayward, Alameda County, California

Prepared for

City of Hayward

And

U.S. Department of Transportation
Federal Aviation Administration

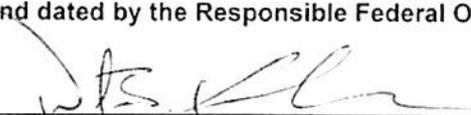
As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

RS&H

February 2016

This Environmental Assessment becomes a Federal document when evaluated, signed and dated by the Responsible Federal Official.



Responsible Federal Official

Date

3/22/2016

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WESTERN-PACIFIC REGION

***FINDING OF NO SIGNIFICANT IMPACT
AND
RECORD OF DECISION***

Proposed Runway Safety Enhancement Project

Hayward Executive Airport
City of Hayward, Alameda County, California



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GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document is the Federal Aviation Administration's (FAA) Finding of No Significant Impact (FONSI) and Record of Decision (ROD) for the City of Hayward's Runway Safety Enhancement Project at the Hayward Executive Airport located in Alameda County, California. This document includes the agency determinations and approvals for those proposed federal actions described in the Final Environmental Assessment (EA) dated February 2016. This document, and the attached Final EA, discuss all alternatives considered by FAA in reaching its decision; summarizes the analysis used to evaluate the alternatives; and briefly summarizes the potential environmental consequences of the Proposed Action and the No Action alternative, which are evaluated in detail in the Final EA, and this FONSI and ROD. This document identifies the environmentally preferred alternative and the agency preferred alternative. This document provides notice of an action occurring in a floodplain in accordance with Executive Order 11988, *Floodplain Management*, and an action occurring in a wetland in accordance with Executive Order 11990, *Protection of Wetlands*. This document identifies applicable and required mitigation.

BACKGROUND. The City of Hayward released a Draft EA for public comment in January 2015 and received comments between January 16, 2015 and February 16, 2015. The City of Hayward released a Final EA and a Proposed FONSI and ROD for public comment in June 2015 and received public comments between June 26, 2015 and July 27, 2015. The EA addressed the potential environmental effects of the proposed Runway Safety Enhancement Project including various alternatives to that proposal. The EA was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) [Public Law 91-190, 42 United States Code (U.S.C.) 4321-4347], the implementing regulations of the Council on Environmental Quality (CEQ) [Title 40, Code of Federal Regulations (CFR) Parts 1500-1508], and FAA Orders 1050.1E, *Environmental Impacts: Policies and Procedures* and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. The FAA approved the Final EA on March 22, 2016.

WHAT SHOULD YOU DO? Read the Final EA and Proposed FONSI and ROD to understand the actions that FAA intends to take relative to the proposed Runway Safety Enhancement Project at Hayward Executive Airport.

WHAT HAPPENS AFTER THIS? The City of Hayward may begin to implement the Proposed Action.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT
AND
RECORD OF DECISION

PROPOSED RUNWAY SAFETY ENHANCEMENT PROJECT

HAYWARD EXECUTIVE AIRPORT
CITY OF HAYWARD
ALAMEDA COUNTY, CALIFORNIA

1. Introduction

This document is a Finding of No Significant Impact (FONSI) on the environment and Record of Decision (ROD) as a result of the proposed Runway Safety Enhancement Project at Hayward Executive Airport (HWD), City of Hayward, Alameda County, California. The City of Hayward (City) is the sponsor for the Hayward Executive Airport. The Federal Aviation Administration (FAA) must comply with the National Environmental Policy Act of 1969 (NEPA) before being able to take the federal action of approval of an application for federal assistance for construction of the proposed project, or approval of those portions of the Airport Layout Plan (ALP) that depict the proposed project. Approval of the ALP is authorized by the Airport and Airway Improvement Act of 1982, as amended (Public Laws 97-248 and 100-223).

- 2. Project Purpose and Need.** As discussed in Sections 1.3 and 1.4 of the Final Environmental Assessment (EA), the City's purpose and need for the Proposed Action is to enhance the safe operation of HWD by making physical modifications to the Air Operations Area (AOA) in the areas between the Runway Safety Areas. The purpose of the Proposed Action includes reducing the potential damage to aircraft that veer off the runways at HWD, improving drainage, and reducing habitat for wildlife hazardous to air operations. The City proposes to do this by implementing the recommendations of the FAA Runway Safety Action Team to take immediate steps to eliminate the hazard posed by the drainage ditches currently located adjacent to the Runway Safety Areas for Runway 10L-28R and 10R-28L.

The FAA's statutory mission is to ensure the safe and efficient use of navigable airspace in the United States. The FAA must ensure that the proposed action does not derogate the safety of aircraft and airport operations at the HWD.

3. Proposed Action and Federal Actions

As discussed in Section 1.5 of the Final EA, the Proposed Action would provide improvements that would enhance Airport safety and efficiency. The City is proposing the following on-Airport projects:

- Construct box culverts for three segments of Sulphur Creek to enhance airport safety;
- Improve drainage, eliminate topographic inconsistencies, and enhance airport safety by grading existing infield areas.

The Proposed Action would specifically involve placing three separate, hydrologically connected, linear segments of Sulphur Creek into box culverts. These include

- Install a 170-foot-long box culvert in Sulphur Creek to convey water between Runway 10L-28R and Taxiway A.
- Install a 180-foot-long box culvert in Sulphur Creek between Runway 10L-28R and Runway 10R-28L.
- Install a 90 foot long box culvert between Taxiway Z and Runway 10R-28L.
- Grade approximately 426,000 square feet (approximately 10 acres) of infield area between runways and taxiways of HWD, to convey surface waters from the AOA to Sulphur Creek, where it is subsequently discharged into San Francisco Bay.

Collectively, those projects comprise the Proposed Action and would bring infield areas of HWD into conformance with FAA airport design standards and implement the recommendation of the FAA Runway Safety Action Team. The construction of box culverts to enclose Sulphur Creek in the areas adjacent to Runways 10L-28R and 10R-28L would protect aircraft from damage and aircraft passengers from injuries that could otherwise occur if an aircraft veered off the runway and subsequently plunged into Sulphur Creek. Installing culverts in Sulphur Creek adjacent to Runways 10L-28R and 10R-28L would also eliminate habitat between the runways for wildlife hazardous to aircraft operations. Re-grading the infield areas would reduce the potential for the accumulation of standing water in those areas. This would also make HWD less attractive to hazardous wildlife.

The proposed Federal actions are:

- Unconditional approval of the ALP to depict installation of additional culverts, pursuant to 49 United States Code (U.S.C.) §§ 40103(b) and 47107(a)(16);
- Determinations under 49 U.S.C. §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the Airport Improvement Program (AIP) to assist with construction of potentially eligible development items shown on the ALP;
- Determination under 49 U.S.C. § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense;
- Approval of further processing of an application for federal assistance for near-term eligible projects using federal funds from the AIP, as shown on the ALP; and
- Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150/5370-2F, *Operational Safety on Airports During Construction*.

4. Reasonable Alternatives Considered

As described in Chapter 2 of the Final EA, the alternatives evaluated include:

- **No Action Alternative:** The No Action Alternative involves no improvements at the HWD. Under the No Action Alternative Sulphur Creek would remain an open channel within the AOA, and no grading of the infield would occur.
- **Alternative 1. Proposed Action.** Construction of Alternative 1 would enclose three segments of Sulphur Creek in box culverts within the AOA and result in grading approximately 426,000 square feet of infield area between runways and taxiways of HWD to improve drainage.
- **Alternative 2. Load bearing grates.** Construction of Alternative 2 would consist of the construction of load-bearing grates over the existing open segments of Sulphur Creek within the AOA. Construction of Alternative 2 would also require the construction of support walls along the sides of each wetland segment of Sulphur Creek. Infield grading of the AOA would be the same as under Alternative 1.

- **Alternative 3. Combination of box culverts and load bearing grates.** Alternative 3 includes a combination of box culverts and load bearing grates. Alternative 3 includes the construction of box culverts for the three segments of Sulphur Creek within the Object Free Zone of Runways (OFZ) 10R-28L and 10L-28R. However the segment of the creek between Runway 10L-28R and Taxiway A, outside of the OFZ, would include support walls along the edge of the wetland and be covered with at-grade load-bearing grates. Infield grading of the AOA would be the same as under Alternative 1.

As described in Section 2.2 of the Final EA, the alternatives were evaluated as to whether the alternatives met the project purpose and need, and whether the alternatives would affect the operational efficiency of HWD.

The results of the Alternatives evaluation are described in Section 2.4 of the Final EA and summarized on Table 2-2 of the Final EA. Alternatives 2 and 3 were not carried forward for detailed evaluation in the Final EA because they did not fully meet the purpose and need of the project, and did not reduce the potential attractiveness of the HWD to wildlife hazardous to aircraft operations as effectively as Alternative 1, the Proposed Action. The No Action alternative has fewer environmental effects than the Proposed Action alternative. However the No Action alternative does not meet the purpose and need for the proposed project but was retained for analysis as required by 40 CFR § 1502.14(d).. The environmental impacts of the Proposed Action and the No Action alternative were evaluated in detail in the Final EA.

5. Assessment

The potential environmental impacts and possible adverse effects created by the Proposed Action and the No Action Alternatives were identified and evaluated in a Final EA prepared in February 2016. The Final EA has been reviewed by the FAA and found to be adequate for the purpose of the proposed Federal action. The FAA determined that the Final EA for the proposed project adequately describes the potential impacts of the Proposed Action and No Action Alternatives. No new issues surfaced as a result of the public review process. Implementation of the No Action Alternative would not involve any construction activities or changes to the existing environment. Therefore, the No Action Alternative has no environmental impacts and the No Action Alternative is not discussed further in this FONSI/ROD.

Chapter 3 of the Final EA identified an Airport Study Area (ASA) (Final EA, Figure 3-1) and environmental resources within that study area that have no potential to be affected by the Proposed Action. These environmental resources include Coastal Resources; Compatible Land Use; Department of Transportation

Section 4(f); Farmlands; Light Emissions and Visual Impacts; Natural Resources and Energy Supply; Noise; Secondary (Induced) Impacts; and Wild and Scenic Rivers. Brief explanations as to why these environmental resources would not be affected as a result of implementation of the Proposed Action are provided in Sections 3.2.1 to 3.2.9 of the Final EA. Section 4.4.1 of the Final EA also identifies these resource categories and specifically states the Proposed Action would not affect them.

Chapter 4 of the Final EA evaluated in detail the potential effect of the Proposed Action on the following environmental impact categories: Air Quality; Fish, Wildlife and Plants; Floodplains; Hazardous Materials, Pollution Prevention, and Solid Waste; Historical, Architectural, Archaeological and Cultural Resources; Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety; Water Quality; Wetlands; Construction Impacts; and Cumulative Impacts.

A. Air Quality. The effects of the Proposed Action on air quality are described in Section 4.2 of the Final EA. Implementation of the Proposed Action would not result in any increase in air emissions associated with aircraft operations at HWD. Section 4.2.2.2, Table 4-1 of the Final EA and Section 4.3, *Construction Impacts*, of the Final EA discuss air emissions associated with construction of the Proposed Action. Construction of the Proposed Action would not result in air emissions that exceeded de minimis levels for any criteria air pollutant emission threshold identified by the National Ambient Air Quality Standards or the California Ambient Air Quality Standards. Therefore, implementation of the Proposed Action would not result in a significant impact on Air Quality.

B. Construction Impacts. Environmental impacts associated with the construction activities needed to implement the Proposed Action are discussed in Section 4.3 of the Final EA. Construction activities, although short-term in duration, have the potential to cause substantial environmental effects. Construction activities associated with the Proposed Action include cement mixing, parking, equipment storage, vehicle staging, and temporary infrastructure designed to accommodate construction crews.

The amount of airborne suspended particulates would temporarily increase in the vicinity of HWD during certain construction activities. Heavy construction equipment used at the site would emit exhaust containing criteria air pollutants regulated by the National Ambient Air Quality Standards and California Ambient Air Quality Standards. Temporary air quality impacts associated with these sources would vary depending on the local weather conditions, level of construction activity, and the nature of the construction operation; however, these temporary impacts would not be significant since the construction would be

of limited duration and the selected contractor would be required to implement Best Management Practices (BMP) noted below.

Criteria pollutant emissions associated with construction of the Proposed Action would not exceed applicable *de minimis* thresholds as described in Section 4.2 of the Final EA, and the Air Quality section of this FONSI/ROD. Therefore, construction activities needed to implement the Proposed Action would not result in a significant air quality impact. To minimize temporary air quality impacts, the contractor would be required to implement BMPs, such as treating excavated areas with water during dry and windy conditions, covering haul trucks, maintaining construction vehicles appropriately, using reduced speeds, suspending certain construction activities during high wind conditions, and covering graded areas with stabilizing materials.

No federally or state listed threatened or endangered species occur within the construction area so construction activities associated with implementation of the Proposed Action would not affect any of these species. As discussed in Section 4.4 of the Final EA, ground nesting birds protected by the Migratory Bird Treaty Act could occur in the Area of Potential Ground Disturbance for the Proposed Action. Therefore, a field survey for migratory birds will be undertaken before construction is initiated and, if ground nesting birds protected by the Migratory Bird Treaty Act are present, a buffer of 50 feet between construction areas and the nesting birds would be established with construction fencing and maintained until the birds have completed nesting. The FAA will condition any AIP grant for construction of this project with the requirement that HWD complete this mitigation measure to minimize environmental effects of the Proposed Action and ensure compliance with the Migratory Bird Treaty Act.

Temporary noise impacts associated with the use of construction vehicles and machinery would be limited to the immediate vicinity of the Proposed Action. Earthwork and site preparation would result in temporary noise generation while these activities are taking place. Noise levels would vary dependent on the nature of construction activities, the type, and model of equipment used. Given the distance to the nearest noise-sensitive land use and the presence of vegetated buffers surrounding HWD, temporary noise impacts from construction equipment would not be significant.

HWD operates two runways and annual operations of propeller aircraft are less than 90,000 operations and less than 700 jet operations. As discussed in Section 4.3 of the Final EA, aviation noise levels associated with those numbers of annual aviation operations is limited. Therefore, any temporary runway closures during project construction that shift all aircraft operations onto Runway 10R-28L or 10L-28R, would not result in significant noise impacts on noise-sensitive land uses.

Short-term construction-related employment of local contractors would occur as a result of the Proposed Action. This is considered to be a positive impact. With respect to changes in traffic volumes in the vicinity of HWD during construction activities, the increase in construction-related traffic would be considered minor. Since these roads around HWD operate at acceptable levels of service, the Proposed Action would not result in significant secondary induced impacts.

BMPs to protect water quality will be implemented to prevent the possibility that contaminants could be discharged into groundwater resources during construction activities. As discussed in Section 4.9 of the Final EA, HWD will be required to implement BMPs to maintain water quality during construction. Construction activities also would be subject to coverage under the General Permit for Discharge of Storm Water Associated with Construction Activity, Construction General Permit Order 2009-0009-DWQ. Given the guidelines of water-related BMPs, construction permit conditions, and the design of project-specific plans; construction activities associated with implementation of the Proposed Action would not have a significant impact on water quality.

C. Fish, Wildlife, and Plants. As discussed in Section 3.3.3 and Section 4.4 of the Final EA, the Proposed Action would result in the elimination of approximately 0.19 acres of wetland/wildlife habitat within the AOA of HWD and its replacement with an enclosed concrete culvert. In addition, the Proposed Action would involve grading activities which would result in the disturbance of approximately 426,000 square feet of annual grassland located on an active airfield surrounded by runways and taxiways, and other sections of Sulphur Creek that are already enclosed in culverts.

FAA has determined that no Federal or State listed threatened or endangered species or critical habitat are known or likely to occur within the ASA, or the Area of Potential Ground Disturbance due to a lack of suitable habitat. Therefore, the Proposed Action would not affect any Federal or State listed threatened or endangered species.

As discussed in Section 4.4 of the Final EA, ground nesting birds protected by the Migratory Bird Treaty Act could occur in the Area of Potential Ground Disturbance for the Proposed Action. Therefore, prior to construction activities, HWD will complete a field survey of the Area of Potential Ground Disturbance to determine if ground nesting birds protected by the Migratory Bird Treaty Act are present. If nests of birds protected by the Migratory Bird Treaty Act are present, a buffer of 50 feet between construction areas and the nesting birds would be established with construction fencing and maintained until the birds have completed nesting. The FAA will condition any AIP grant for construction of this project with the requirement that HWD complete this mitigation measure to

minimize environmental effects of the Proposed Action and ensure compliance with the Migratory Bird Treaty Act.

Section 4.4.2.2 of the Final EA states the Proposed Action would not result in adverse effects to Federal or State listed Threatened or Endangered Species. This section of the Final EA also states the Proposed Action would result in the loss of approximately 0.19 acres of wetland/wildlife habitat. This is habitat that could be used by migratory birds and common wildlife species. This habitat loss would be mitigated as described in Section 4.10 of the Final EA regarding Wetland impacts and in the Wetland impact paragraph of this FONSI/ROD.

D. Floodplains. As discussed in Section 3.3.2 and 4.5 of the Final EA, implementation of the Proposed Action would enclose three segments of Sulphur Creek within the AOA within concrete box culverts and result in grading approximately 426,000 square feet of infield area between runways and taxiways of HWD. All three culverts are within the 100-year floodplain of Sulphur Creek and portions of the 426,000 square foot graded area are also within the 100-year floodplain of Sulphur Creek.

The Purpose and Need of the Proposed Action is discussed in Chapter 1 of the Final EA and includes reducing the potential damage to aircraft that veer off the runways at HWD, improving drainage, and reducing habitat for wildlife hazardous to air operations. The Purpose and Need of the project cannot be met by implementing a project outside of the 100-year floodplain of Sulphur Creek because the primary source of potential damage to an aircraft and its passengers that veers off the runway is that the aircraft would plunge into Sulphur Creek itself. Similarly, the location of the proposed drainage improvements and reductions in habitat for wildlife hazardous to air operations are also physically located in the 100-year floodplain of Sulphur Creek, and cannot be implemented elsewhere. Therefore, there is no practicable alternative to implementing the Proposed Action within the 100-year floodplain. HWD cannot implement the recommendations of the FAA Runway Safety Action Team to take immediate steps to eliminate the hazard posed by the drainage ditches currently located adjacent to the Runway Safety Areas for Runway 10L-28R and 10R-28L without implementing the project within the 100-year floodplain.

The effect of the Proposed Action on the 100-year floodplain was evaluated in Section 4.5.2 of the Final EA. With implementation of the Proposed Action, the elevation of areas inundated by the 100-year floodplain is anticipated to increase by 0.1 foot. This is due to the installation of the box culverts with water inlet structures in place of a continuously open stream channel. However, as shown in Figures 1-5 and 4-1 of the Final EA, the lateral extent of the 100-year floodplain is essentially the same under the Proposed Action and the No Action Alternative. So, while implementation of the Proposed Action would increase the

depth of water in areas inundated within the 100-year floodplain on HWD by 0.1 foot, the lateral extent of the 100-year floodplain is essentially unchanged under the Proposed Action as compared to the No Action alternative.

The 426,000 square feet of infield grading associated Proposed Action will facilitate improved drainage with the AOA, as compared to the No Action alternative. So while the 100-year flood elevation will be 0.1 foot deeper under the Proposed Action, flood water would be expected to drain away more evenly, and without ponded areas.. The FAA concludes the enhancements of aviation safety obtained by placing Sulphur Creek within underground box culverts and the improved drainage to reduce use of ponded areas on HWD by hazardous wildlife warrants the 0.1 foot increase in the 100-year floodplain elevation on HWD.

As described in Section 4.5.2.2 of the Final EA, the FAA considers an action to have a significant encroachment and impact on a 100-year floodplain when that action:

- 1) would have a high probability of loss of human life;
- 2) would likely have substantial, encroachment-associated costs or damage, including interrupting aircraft service or loss of a vital transportation facility (e.g., flooding of a runway or taxiway; important navigational aid out of service due to flooding, etc.); or
- 3) would cause significant adverse impacts on natural and beneficial floodplain values.

Implementation of the Proposed Action and the associated 0.1 foot increase in depth of the existing 100-year floodplain, would not result in:

- 1) a high probability of loss of human life;
- 2) a substantial, encroachment-associated costs or damage, including interrupting aircraft service or loss of a vital transportation facility (e.g., flooding of a runway or taxiway; important navigational aid out of service due to flooding, etc, beyond what already occurs under existing conditions); and
- 3) significant adverse impacts on natural and beneficial floodplain values.

Therefore, implementation of the Proposed Action would not result in a significant impact or significant encroachment on the existing floodplain.

E. Hazardous Materials, Pollution Prevention, and Solid Waste. As discussed in Section 4.6 of the Final EA, implementation of the Proposed Action would not increase the number of operations and enplanements at HWD, and, therefore not result in permanent change in the amount of municipal solid waste generated at HWD. Also, the improvements associated with the Proposed Action are not located in areas of HWD that are known or suspected to contain environmental contamination. Therefore, implementation of the Proposed Action

would not result in a significant impact associated with the generation of solid waste or hazardous waste. An evaluation of pollution prevention measures associated with the use and disposition of hazardous materials during construction is discussed in the Section 4.3 of the Final EA and the Construction Impacts section of this FONSI/ROD.

F. Historical, Architectural, Archaeological, and Cultural Resources. As discussed in Section 4.7 of the Final EA, there are no historic properties on HWD that are on or eligible for listing on the National Register of Historic Places (NRHP) within the Area of Potential Effect (APE). The FAA had previously consulted with the California State Historic Preservation Officer (SHPO) regarding whether resources on or eligible for the NRHP at HWD. The SHPO concurred with FAA's determination that there are no historic properties present at HWD within the APE. As discussed in Section 4.7.2.2 of the Final EA, the FAA reconfirmed this determination with the California SHPO on October 29, 2015. It is very unlikely that undiscovered archaeological resources eligible for the NRHP exist at HWD, as extensive grading and earthmoving activities have occurred in developing the airfield in the past. As there are no historic properties on or eligible for the NRHP within the APE, the Proposed Action would have no effect on historic properties. However, in the event that unanticipated archaeological or cultural resources are discovered during construction, all ground disturbing activities in the vicinity of the find will be halted. The SHPO and FAA would immediately be notified to ensure compliance with 36 CFR § 800.13, *Post Review Discoveries*.

G. Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety. Section 4.8 of the Final EA addresses potential for Socioeconomic Impacts, disproportionate environmental impacts on low-income or minority populations resulting in Environmental Justice impacts, and Children's Environmental Health and Safety impacts.

The Proposed Action would not require the acquisition of land, relocation of any individuals, or result in the disruption of any established community or existing local traffic patterns. Construction activities associated with the Proposed Action would occur entirely on HWD property and would not temporarily or permanently disrupt essential community services.

The Proposed Action has no potential to relocate minority or low-income populations closer to environmental contaminants, and would not produce a significant increase in air pollutant emissions, or result in a release of environmental contaminants into the environment. Therefore, the Proposed Action would not result in a disproportionately high or adverse environmental impact on minority or low-income populations.

Section 4.8.2.2 of the Final EA states, the Proposed Action has no potential to relocate children to locations closer to environmental contaminants, to produce a significant increase in air pollutant emissions, or result in a release of environmental contaminants into the environment. Therefore, the Proposed Action would not increase environmental health and safety risks to children.

H. Water Quality. As discussed in Section 4.9 of the Final EA, implementation of the Proposed Action involves the placement of culverts (8-feet by 4-foot culverts) and fill into Sulphur Creek. Section 4.9.2.2 of the Final EA describes the three sections of culvert that are to be installed. Specifically, the first section (from Taxiway A to Taxiway Z, respectively) would involve the placement of a 170-foot-long box culvert and the subsequent filling and grading of a 3,920-square-foot segment of the creek. The second segment would involve the placement of a 180-foot-long box culvert into Sulphur Creek. This component would also involve subsequent filling and grading of 2,745-square-feet of creek channel. Finally, a 90-foot-long section of box culvert would be placed into the third and final segment of Sulphur Creek. This 1,655 square-foot area would also be filled and graded. This action would result in the replacement of the existing natural creek bottom with an impervious concrete bottom. The net increase in impervious surface area caused by the above activities would result in a 0.67-acre foot stormwater runoff increase over the duration of the entire year and would reduce natural infiltration in this portion of Sulphur Creek.

During construction, grading of the infield has the potential to increase sediment loads and turbidity in stormwater runoff. In the long term, the proposed channelization of the creek would decrease sediment loads into Sulphur Creek due to the replacement of the earthen banks between the infields with a concrete-lined channel. The Proposed Action would be subject to existing water quality permit conditions set forth in National Pollutant Discharge Elimination System Permit number CAS612008 and would not require groundwater withdrawals at HWD.

Since the Proposed Action would involve grading and soil disturbance over 1 acre, HWD will be required to file a Notice of Intent (NOI) with the San Francisco Regional Water Quality Control Board (SFRWQCB) to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit). The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan that includes construction and post-construction BMPs including, but not limited to the following:

- Install fiber rolls or silt fencing adjacent to aquatic features for erosion control. Fiber rolls should be buried 3-4 inches into the soil, staked every 4 feet, and limited to use on 3:1 slopes. Silt fencing should be trenched 6

inches by 6 inches into the soil, staked every 6 feet, and placed 2-5 feet from the toe of any slope;

- Designate a concrete washout area to avoid wash water from concrete tools or trucks from entering gutters, inlets, or storm drains. Maintain washout area and dispose concrete waste on a regular basis; and
- Protect drain inlets from polluted storm water through the use of filters such as fabrics, gravel bags, or straw wattles.

With implementation of the BMPs described above, the Proposed Action would not exceed water quality standards. Therefore, implementation of the Proposed Action would not result in a significant water quality impact.

I. Wetlands. As discussed in Section 4.10.2.2 of the Final EA, implementation of the Proposed Action involves the installation of three culverts that would result in the fill of 440 linear feet of Sulphur Creek including adjacent wetlands and totaling approximately 0.19 acres. This amount of stream channel and wetland impact is the minimum possible impact that allows the purpose and need of the project to be met, as this is the minimum fill amount that is required to install the three culverts in Sulphur Creek. Therefore, the Proposed Action is the least environmentally damaging practicable alternative to meet the purpose and need for the project.

To compensate for the loss of 0.19 acres, and 440 linear feet of jurisdictional waters, the City of Hayward, as the airport sponsor, would restore or purchase stream channel and/or wetland habitat credit from an established mitigation bank, or identify an alternative mitigation measure to compensate for the losses of stream channel and wetland habitat at a minimum 1:1 ratio.

Implementation of the Proposed Action will require authorization to fill waters within Clean Water Act jurisdiction from the U.S. Army Corps of Engineers under the Clean Water Act, Section 404 permit program, and Water Quality Certification from the local water quality certification agency, the SFRWQCB. As the Proposed Action involves filling less than 0.5 acre of jurisdictional waters, the project could be authorized by the U.S. Army Corps of Engineers under Nationwide Permit 39 for Commercial and Institutional Developments or as an Individual Permit. The city of Hayward would submit a Clean Water Act, Section 404 permit application for the Proposed Action as part of the engineering design process.

In previous informal discussions between the City of Hayward and the SFRWQCB, the SFRWQCB has indicated their preference for mitigation for impacts to Sulphur Creek in the form of daylighting upstream creek channels currently in underground culverts. Alternatively, the City of Hayward could purchase mitigation credits, after an appropriate mitigation ratio was determined

to offset wetland impacts during the Clean Water Act, Section 404 permitting process. These credits would be purchased from a wetland mitigation bank approved by the U.S. Army Corps of Engineers and the SFRWQCB within the lowlands surrounding San Francisco Bay. For example, HWD is within the agency-approved service area for the San Francisco Bay Wetland Mitigation Bank at Redwood Shores on San Francisco Bay.

The U.S. Army Corps of Engineers and the SFRWQCB would both review the city of Hayward's proposed mitigation prior to the U.S. Army Corps of Engineers issuance of a Clean Water Act, Section 404 authorization for this project or the SFRWQCB issuance of a Clean Water Act, Section 401, water quality certification for the Proposed Action.

The conversion of approximately 0.19 acres of wetlands and 440 linear feet of creek channel is a potentially significant impact that would be reduced to a not-significant level because mitigation for the impact of the placing the wetlands and creek channel in a culvert will be required by the Clean Water Act, Section 404 permit. In order to further ensure that this potentially significant impact is reduced to a not significant level, the FAA will condition any AIP grant for construction of this project with the requirement that the city of Hayward must provide the FAA with a current U.S. Army Corps of Engineers Clean Water Act, Section 404 authorization to proceed with the Proposed Action before the city of Hayward undertakes any construction of the Proposed Action. Since the impact of the Proposed Action would be offset by these mitigation measures, implementation of the Proposed Action would not result in a significant wetland impact.

J. Cumulative Impacts. Section 4.11 of the Final EA describes other past, present, and reasonably foreseeable projects in the ASA for the Proposed Action. The past, present, and reasonably foreseeable projects have increased the quantities of impervious surfaces at HWD. Surface runoff increases have not caused Sulphur Creek to exceed its 15-year storm design capacity. When past, present, and reasonably foreseeable projects are considered in relation to the Proposed Action, those projects would not cumulatively contribute to a significant adverse environmental effect. Therefore, implementation of the Proposed Action would not result in a significant cumulative environmental impact.

6. Public Participation

As discussed in Section 5 of the Final EA, the Notice of Availability of the Draft EA for a 30-day review period was published in the *Hayward Daily Review* newspaper on January 16, 2015. The review period extended through February 17, 2015. A Notice of Availability of a Final EA and a Proposed

FONSI/ROD was published in the *Hayward Daily Review* on June 26, 2015. The review period extended through July 27, 2015.

During the review periods the Draft EA and Final EA were available at the administrative office of HWD, and HWD's website www.haywardairport.org, the Hayward Public Library, the FAA's San Francisco Airports District Office, and FAA's Western-Pacific Region Office in Hawthorne, California. Three comment letters were received during the public comment period on the Draft EA, with two of the letters being sent by the same person. One public comment letter was received during the public comment period on the Final EA. The public comments did not identify any environmental impacts of the Proposed Action that had not been previously considered. The public comments and responses are included in Appendix F of the Final EA.

7. Inter-Agency Coordination

In accordance with 49 USC § 47101(h), FAA has determined that no further coordination with the U.S. Department of Interior or the U.S. Environmental Protection Agency is necessary because the proposed project does not involve construction of a new airport, new runway or major runway extension that has a significant impact on natural resources including fish and wildlife; natural, scenic and recreational assets; water and air quality; or another factor affecting the environment.

8. Reasons for the Determination that the Proposed Project will have No Significant Impacts.

The attached Final EA evaluates the potential of the Proposed Action and alternatives to have an environmental impact on environmental resources as identified in FAA Orders 1050.1F, *Environmental Impacts: Policies and Procedures*, and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. As described in the Final EA, implementation of the Proposed Action would not result in any environmental impacts after mitigation that would exceed the threshold of significance as defined by FAA Orders 1050.1F and 5050.4B. The FAA will include as a special condition for approval of further processing of an application for federal assistance for near-term eligible projects using federal funds from the AIP, as shown on the ALP, that the City of Hayward agrees to mitigate for environmental impacts to the Sulphur Creek stream channel and wetlands at a minimum 1:1 ratio, as identified in Section 4.10 of the Final EA.

9. Agency Findings.

The FAA makes the following determinations for this project based on the information and analysis set forth in the Final EA and other portions of the administrative record.

A. Floodplains: As discussed in Section 3.3.2 and 4.5 of the Final EA, portions of the Proposed Action would occur within the 100-year floodplain of Sulphur Creek on HWD. The Purpose and Need of the Proposed Action is discussed in Chapter 1 of the Final EA and includes reducing the potential damage to aircraft that veer off the runways at HWD, improving drainage, and reducing habitat for wildlife hazardous to aircraft and airport operations. As discussed in Chapter 2 of the Final EA, the Purpose and Need of the project cannot be met by implementing a project outside of the 100-year floodplain of Sulphur Creek because the primary source of potential damage to an aircraft, and its passengers, that veers off the runway is that the aircraft would plunge into Sulphur Creek itself. The FAA identified no practicable alternatives to avoid the floodplain.

In accordance with Department of Transportation Order 5650.2, *Floodplain Management and Protection*, the FAA considers an action to have a significant encroachment on a 100-year floodplain when that action:

- 1) would have a high probability of loss of human life;
- 2) would likely have substantial, encroachment-associated costs or damage, including interrupting aircraft service or loss of a vital transportation facility (e.g., flooding of a runway or taxiway; important navigational aid out of service due to flooding, etc.); or
- 3) would cause significant adverse impacts on natural and beneficial floodplain values.

The Final EA disclosed that implementation of the Proposed Action is anticipated to increase the elevation of the 100-year floodplain by 0.1 foot, while the lateral extent of the 100-year floodplain is essentially unchanged. Therefore, the FAA has determined that the Proposed Action would not result in a significant encroachment or impact on the 100-year floodplain, and that there is no prudent or feasible alternative to locate the Proposed Action completely outside of the 100-year flood.

B. Wetlands: As discussed in Sections 2.6, 3.3.8 and 4.10 of the Final EA, implementation of the Proposed Action would require removal of 0.19 acre of wetlands. Consistent with the provisions of Executive Order 11990, *Protection of Wetlands*, dated May 24, 1977, the FAA finds that there is no practicable

alternative to the removal of 0.19 acre of wetlands on HWD property to construct the Proposed Action. The FAA has determined that all practicable measures to minimize harm to wetlands, including providing compensatory mitigation for the wetlands removed, will be taken as part of the Proposed Action.

C. Independent and Objective Evaluation: As required by the Council on Environmental Quality (40 CFR § 1506.5), the FAA has independently and objectively evaluated this proposed project. As described in the Final EA, the Proposed Action, and the No Action alternatives were studied extensively to determine the potential impacts and appropriate mitigation measures for those impacts. The FAA provided input, advice, and expertise throughout the analysis, along with administrative and legal review of the project.

10. Decision and Orders.

Based on the information in this FONSI/ROD and supported by detailed discussion in the Final EA, the FAA has selected the Proposed Action, the Runway Safety Enhancement Project, as the FAA's Preferred Alternative. The FAA must select one of the following choices:

- Approve agency actions necessary to implement the Proposed Action, or
- Disapprove agency actions to implement the Proposed Action.

Approval signifies that the applicable federal requirements relating to the proposed airport development and planning have been met. Approval permits the City of Hayward to proceed with implementation of the Proposed Action and associated mitigation measures. Disapproval would prevent the City of Hayward from implementing the Proposed Action elements at HWD.

Under the authority delegated to me by the Administrator of the Federal Aviation Administration, I find that the project is reasonably supported. I therefore, direct that action be taken to carry out the agency actions more fully discussed in Section 3 of this FONSI/ROD:

A. Unconditional approval of the ALP to depict installation of additional culverts, pursuant to 49 U.S.C. §§ 40103(b) and 47107(a)(16);

B. Determinations under 49 U.S.C. §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the ALP to assist with construction of potentially eligible development items shown on the ALP;

C. Determination under 49 U.S.C. § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense;

D. Approval of further processing of an application for federal assistance for near-term eligible projects using federal funds from the AIP, as shown on the ALP; and

E. Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150/5370-2F, *Operational Safety on Airports During Construction*.

APPROVED:



Mark A. McClardy
Manager, Airports Division, AWP-600

5/10/16

Date

DISAPPROVED:

Mark A. McClardy
Manager, Airports Division, AWP-600

Date

RIGHT OF APPEAL

This FONSI/ROD constitutes a final order of the FAA Administrator and is subject to exclusive judicial review under 49 U.S.C. § 46110 by the U.S. Circuit Court of Appeals for the District of Columbia or the U.S. Circuit Court of Appeals for the circuit in which the person contesting the decision resides or has its principal place of business. Any party having substantial interest in this order may apply for review of the decision by filing a petition for review in the appropriate U.S. Court of Appeals no later than 60 days after the order is issued in accordance with the provisions of 49 U.S.C. § 46110.

WHAT'S IN THIS DOCUMENT? This document contains a Final Environmental Assessment (EA) for the City of Hayward's proposed improvements to place culverts in sections of Sulphur Creek at Hayward Executive Airport (HWD). This document discloses the analysis and findings of the potential impacts of the City of Hayward's Proposed Action, the No Action, and other reasonable alternatives.

BACKGROUND. In October 2012 the Runway Safety Action Team (RSAT) identified that HWD should modify the areas adjacent to Runway 19L-28R to eliminate open, unculverted sections of Sulphur Creek. The proposed infrastructure improvements (Proposed Action) would directly benefit HWD operations by: 1) protecting aircraft from damage and aircraft passengers from injuries that could occur if an aircraft that veered off the runway subsequently plunged into Sulphur Creek; 2) improving drainage and reducing the duration of ponding on the northwest portion of the airfield; and 3) reducing wildlife hazard attractants on HWD. The Proposed Action is necessary to facilitate safe and efficient Airport operations and is considered by the City of Hayward to be of the highest priority to the development of HWD.

The Draft EA was released on January 16, 2015 and made available for comment during a 30-day comment period which lasted until February 17, 2015. The notice of availability of the Draft EA was advertised in the Hayward Daily Review to inform the general public and other interested parties. Comments received during the 30-day comment period on the Draft EA were addressed and can be found in **Appendix F. Addenda and Response to Comments.**

The Final EA and a Proposed Finding of No Significant Impact and Record of Decision (FONSI and ROD) were released on June 26, 2015 and made available for comment during a 30-day comment period which lasted until July 27, 2015. The notice of availability of the Final EA was advertised in the Hayward Daily Review to inform the general public and other interested parties. Comments received during the 30-day comment period on the Final EA were addressed and can be found in **Appendix F. Addenda and Response to Comments.**

The document presented herein represents the Final EA for the federal decision-making process in fulfillment of FAA's policies and procedures relative to the National Environmental Policy Act (NEPA) and other related federal requirements. Copies of the document are available for inspection at the locations described in **Chapter 5**, Table 5-1 of this Final EA and on the HWD website at <http://www.haywardairport.org/>.

WHAT SHOULD I DO? Read the Final EA to understand the actions that the City of Hayward and the FAA intend to take relative to the proposed Runway Safety Enhancement Project at the Airport.

WHAT HAPPENS AFTER THIS? The FAA will decide to prepare and issue a FONSI and ROD or decide to prepare an Environmental Impact Statement.

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1 CHAPTER 1 PURPOSE AND NEED

The FAA is the lead federal agency to ensure compliance with the National Environmental Policy Act (NEPA) for airport development actions. This Environmental Assessment (EA) has also been prepared in accordance with Federal Aviation Administration (FAA) Order 1050.1E, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.¹² This EA identifies and evaluates potential environmental impacts related to the proposed implementation of runway safety enhancements at Hayward Executive Airport (HWD or Airport).

This chapter provides an introduction to the Airport and describes the Purpose and Need for the Proposed Action. FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, requires that the EA fully address and convey the purpose and need for a proposed action.³ The Purpose and Need for the Proposed Action serves as the foundation for the identification of reasonable alternatives to the Proposed Action and the evaluation of the effects associated with project implementation. The “purpose” describes what problems the Airport is facing, while the “need” describes why the Airport must solve those problems.

1.1 INTRODUCTION

The Airport is owned and operated by the City of Hayward (City) in Alameda County (County), California (see **Figure 1-1**). The Airport is identified in the FAA’s National Plan of Integrated Airports System (NPIAS) as a reliever airport for Oakland International Airport.⁴ A reliever airport is a high-capacity general aviation airport in a metropolitan area that reduces traffic loads at a commercial service in a region and to provide more access for a community’s overall general aviation. HWD also is categorized by the FAA as a “National” general aviation airport that serves national and international markets.⁵

The Airport is located approximately two miles west-southwest of downtown Hayward approximately 0.5 miles west of Interstate 880, and 1.5 miles east of the San Francisco Bay (see **Figure 1-2**). The Airport is located on 527 acres. The City’s Skywest Golf Course, adjacent to the northern boundary of the Airport, is also dedicated Airport property. John F. Kennedy Park is also located on City-owned property to the north of the Airport’s main facilities.

A full-time professional airport manager manages the day-to-day operations of the Airport. A Council Airport Committee (CAC), comprised of three members from the Hayward City Council,

¹ Federal Aviation Administration, Order 1050.1E, *Environmental Impacts: Policies and Procedures*, http://www.faa.gov/documentLibrary/media/order/energy_orders/1050-1E.pdf, March 20, 2006.

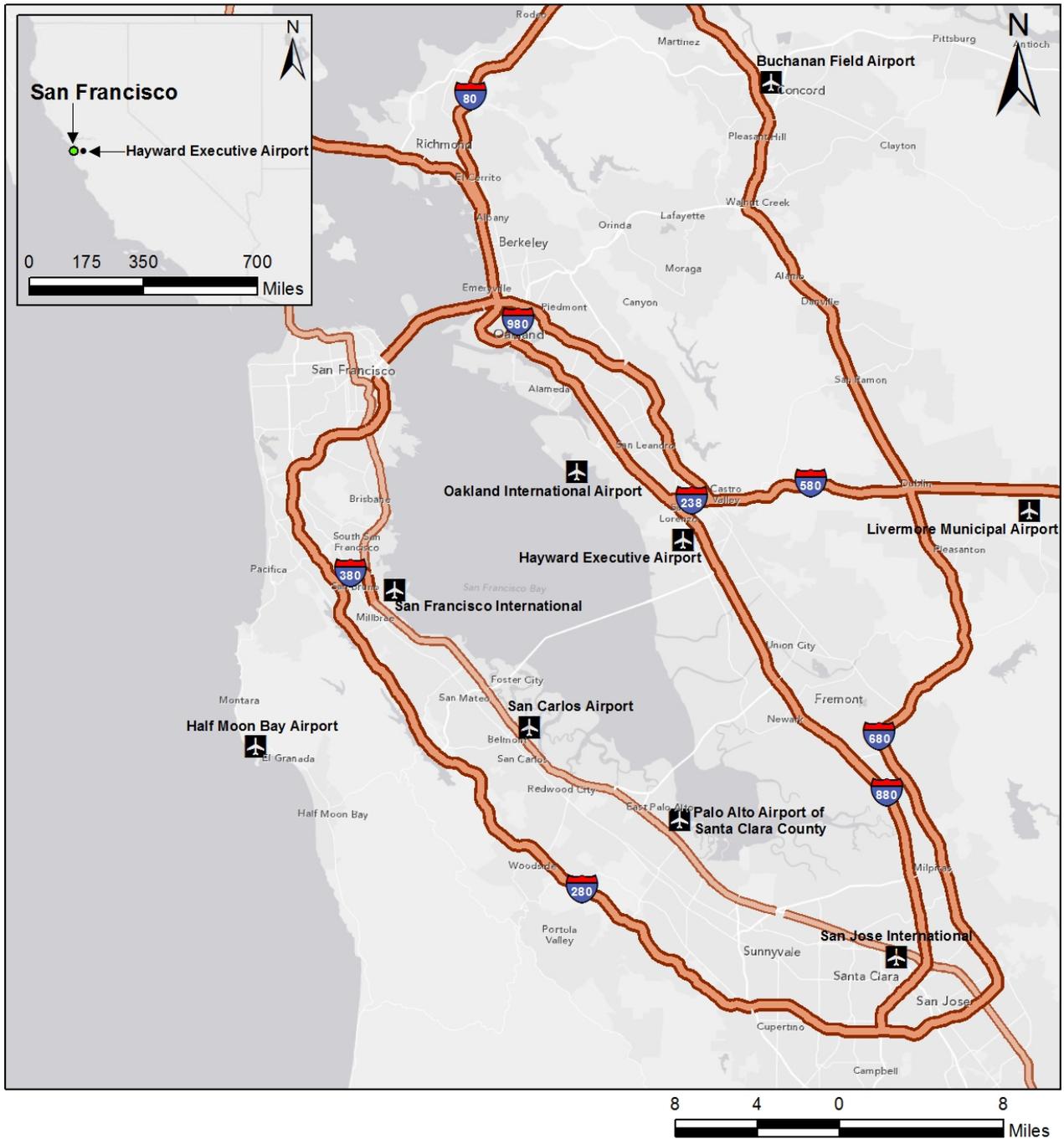
² Federal Aviation Administration, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 26, 2006.

³ Federal Aviation Administration, Order 5050.4B Paragraph 706.b(3)(a)-(c), *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 26, 2006.

⁴ Federal Aviation Administration, *National Plan of Integrated Airports System*. Available at: http://www.faa.gov/airports/planning_capacity/npias/. Accessed: December, 2013.

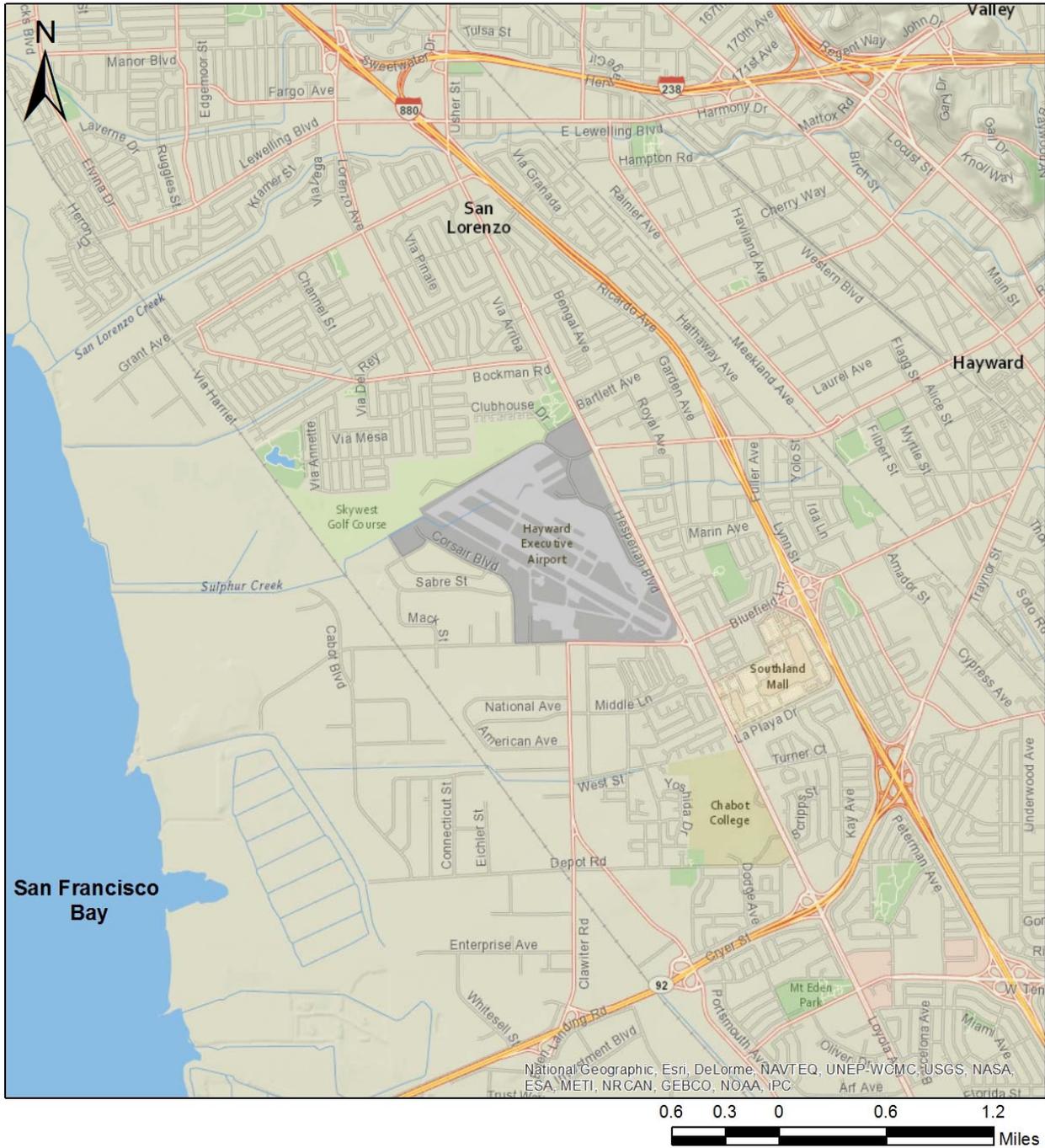
⁵ Federal Aviation Administration, *General Aviation Airports: A National Asset: A fresh look at the many roles General Aviation Airports play in the National Air Transportation System*, May 2012.

Figure 1-1
AIRPORT LOCATION MAP



SOURCE: ESRI, RS&H, 2013
PREPARED BY: RS&H, 2013

Figure 1-2
VICINITY MAP



SOURCE: ESRI, RS&H, 2013
PREPARED BY: RS&H, 2013

reviews and considers policy recommendations related to airport fees, operating permits, land use changes on Airport property, and other matters that affect the community and Airport tenants, prior to the City Council taking action on those matters.

1.2 BACKGROUND INFORMATION

As shown in **Figure 1-3** the airfield is comprised of two parallel runways in a northwest-southeast orientation. Runway 10R-28L has a displaced threshold on each approach end, which limits the runway landing distance available for arriving aircraft. Runway 10R-28L is 5,694 feet long by 150 feet wide and has an airport reference code (ARC) C-II, which accommodates aircraft with a wingspan up to 79 feet and a tail height of up to 30 feet and an aircraft approach speed of 121 to 141 knots. The existing displaced thresholds on Runway 10R-28L are 816 feet from the runway end on Runway 10R and 676 feet from the runway end on Runway 28L. The displaced thresholds are in place for noise mitigation (noise reduction) purposes and to accommodate any aircraft that undershoots the runway as the existing Runway Safety Area (RSA) for Runway 10R-28L is shorter than the FAA RSA design standard. Runway 10L-28R is 3,107 feet long by 75 feet wide and accommodates smaller design group ARC B-I aircraft, which include aircraft with a 91- to 120-knot approach speed, a wingspan of less than 49 feet, and a tail height of less than 20 feet.

1.2.1 Airport Forecast

The FAA Terminal Area Forecast (TAF) was used to estimate the annual aircraft operations (one operation is one takeoff or landing by an aircraft) occurring at HWD. Recent and forecasted aviation activity at HWD is presented in **Table 1-1**.

Table 1-1
RECENT ESTIMATED AND FORECAST AIRCRAFT OPERATIONS

	Planning Period			
	2011 ^{/a/}	2014	2016	% AAG ^{/b/}
Total Operations	87,478	83,889	84,984	-0.58%

^{/a/} Most recent year approved.
^{/b/} AAG – average annual growth

SOURCE: FAA Terminal Area Forecast (TAF), 2013.
PREPARED BY: RS&H, 2013.

Figure 1-3
EXISTING AIRFIELD AT HWD



1.3 CITY'S PURPOSE AND NEED

The City's purpose and need for the Proposed Action is to enhance the safe operation of the Airport by making physical modifications to the Air Operations Area (AOA) in the areas between the RSAs. The City proposes to do this by implementing the recommendations of the Runway Safety Action Team (RSAT) to "Recommend the Airport take immediate steps to eliminate the hazard posed by the drainage ditches currently located adjacent to the runway safety area for Runway 10L-28R".⁶

⁶ FAA, *Local Runway Safety Action Plan Hayward Executive Airport*, October 2012.

The need for the Proposed Action includes reducing the potential damage to aircraft that veer off the runways at HWD, improving drainage, and reducing habitat for wildlife hazardous to air operations. The Proposed Action would:

- Protect aircraft from damage and aircraft passengers from injury should an aircraft veers off a runway within the AOA.
- Improve drainage to allow the areas between runways and taxiways to drain more uniformly after heavy rains or flooding by meeting FAA airport design standards.
- Reduce habitat in the AOA that is likely to attract wildlife hazardous to aircraft operations.
- The FAA RSAT has identified that the open air sections of Sulphur Creek adjacent to the RSAs need to be eliminated to enhance safety at the Airport.
- When the City previously received federal Airport Improvement Program grant funds for improvement projects at the Airport, the City agreed to abide by FAA Advisory Circular 150/5200-33B *Hazardous Wildlife Attractants on and near Airports*, which describes how to minimize the attractiveness of the airport to wildlife hazardous to aircraft operations (wildlife aircraft strike hazards)."

The purpose of the Proposed Action is to implement airport improvements that will address the need to protect aircraft from damage and aircraft passengers from injury should an aircraft veer off a runway within the AOA, reduce the occurrence and duration of ponded water and flooding, and reduce the attractiveness of the AOA to wildlife hazardous to aircraft operations. The elements of the project that will accomplish these purposes include:

- Enclosing Sulphur Creek at the three locations adjacent to RSAs where Sulphur Creek is currently an open air channel.
- Grade infield sections of the AOA to a slight uniform slope grade that meets FAA airport design standards which will allow the AOA to drain more uniformly after flooding than under current conditions.

1.4 FAA PURPOSE AND NEED

The FAA's statutory mission is to ensure the safe and efficient use of navigable airspace in the United States as set forth under 49 USC § 47101(a)(1). The FAA must ensure that the Proposed Action does not derogate the safety of aircraft and airport operations at the Airport.

1.5 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action would provide improvements that would enhance Airport safety and efficiency. As shown in **Figure 1-4**, the City is proposing the following on-Airport projects:

- construct box culverts for segments of Sulphur Creek to enhance Airport safety; and
- improve drainage, eliminate topographic inconsistencies, and enhance Airport safety by grading existing infield areas.

Figure 1-4
PROPOSED ACTION



Source: ESRI, 2013; RS&H, 2013 Prepared By: RS&H, 2013

Sources: Esri, DeLorme, USDA, USGS, AEX, GeoEye, Geomapping, AeroGRID, IGN, IGP, and the GIS User Community



Legend

- Area of Potential Ground Disturbance
- Existing Sulphur Creek Culvert
- Grading Areas
- Airport Property
- Area to be Culverted and Graded
- Sulphur Creek

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Collectively, those projects comprise the Proposed Action and would bring infield areas of the airfield into conformance with FAA airport design standards.⁷ Re-grading these areas infield areas of approximately 426,000 square feet, or about 10 acres, would reduce the potential for the accumulation of standing water within infield areas. This would also make the Airport less attractive to hazardous wildlife, which represents a wildlife-aircraft strike hazard. The RSA and AOA re-grading component would bring the RSA into compliance with FAA Advisory Circular 150/5300-13A Section 305, Subpart A by eliminating small changes in the ground elevation on the AOA. The areas proposed for grading and drainage improvements are shown in Figure 1-4. The following sections summarize each project component.

1.5.1 Construct Box Culverts for Segments of Sulphur Creek

In October of 2012, the RSAT Team assessed the Airport for compliance with FAA standards. The RSAT Team recommended that the Airport “take immediate steps to eliminate the hazard posed by Sulphur Creek”, which is located adjacent to the RSA of Runway 10L-28R.⁸ The construction of box culverts to contain Sulphur Creek in the areas adjacent to Runways 10L-22R and 10R-28L would protect aircraft from damage and aircraft passengers from injuries that could occur if an aircraft that veered off the runway plunged into Sulphur Creek. Installing culverts in Sulphur Creek adjacent to Runways 10L-22R and 10R-28L also would eliminate habitat between the runways for wildlife hazardous to aircraft operations (which could collide with aircraft) such as Canada geese, other waterfowl, herons, and egrets.

This project component of the Proposed Action would specifically involve placing three separate, hydrologically connected, linear segments of Sulphur Creek into box culverts. The first segment would involve placing a 170-foot-long box culvert in Sulphur Creek to convey water between Runway 10L-28R and Taxiway A. The second segment would involve placing a 180-foot-long box culvert in the creek to convey water between Runway 10L-28R and Runway 10R-28L. The third segment would involve placing a 90-foot-long box culvert to convey water between Taxiway Z and Runway 10R-28L. The construction of these culverts satisfies a RSAT recommendation and would replace the existing open earthen channel within the AOA with a graded and maintained grass area.

1.5.2 Improve Grading and Drainage in Infield Areas

The most recent February 9, 2000 flood insurance rate map (FIRM) for the Airport shows that the northwest portions of the Airport are subject to flooding as a result of 100-year storm events (see **Figure 1-5**).^{7,8} Flooding is also caused by culvert blockages and by vegetation overgrowth within the earthen channel of Sulphur Creek in the AOA. Topographic depressions within infield areas of the AOA also present an unsafe condition in the event an aircraft leaves the runway, promote ponding after precipitation events, and can result in wildlife hazard attractants after storm events (see **Figure 1-6**).

⁷ Federal Emergency Management Agency, Maps 06001C0267G and 06001C0286G, Accessed December, 2013.

⁸ The capacity of Sulphur Creek is less than the 15-year design storm event. Due to urbanization of the watershed, flow rates are greater than they would be in the undeveloped state. This urbanization within the watershed has directly led to the marginal capacity of Sulphur Creek.

Figure 1-5
100-YEAR FLOODPLAIN AT THE AIRPORT



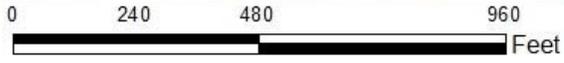
Legend

- Airport Property
- Sulphur Creek
- 100 Year Flood Zones
- - - Existing Sulphur Creek Culvert

Figure 1-6
EXISTING WETLANDS (WILDLIFE HAZARD ATTRACTANTS)
BETWEEN RUNWAYS AND TAXIWAYS



Source: ESRI, 2013; RS&H, 2013 Prepared By: RS&H, 2013



Legend

-  Airport Property
-  Wetlands
-  Sulphur Creek Culvert
-  Sulphur Creek

The infield drainage areas, located between runways and taxiways of the airfield, are designed to convey surface waters from the AOA to Sulphur Creek, where it is subsequently discharged into San Francisco Bay. These earthen channels have slowly eroded over the years. As a result, portions of the AOA tend to flood during precipitation events. Therefore, the Sulphur Creek channel depth needs to be reestablished and the AOA infield drainage areas need to be re-graded to drain efficiently.

1.6 REQUESTED FEDERAL ACTIONS

The requested Federal action(s) being considered in this EA are:

1. unconditional approval of the ALP to depict installation of additional culverts, pursuant to 49 United States Code (USC) §§ 40103(b) and 47107(a)(16);
2. determinations under 49 USC §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the Airport Improvement Program (AIP) to assist with construction of potentially eligible development items shown on the ALP;
3. determination under 49 USC § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense;
4. approval of further processing of an application for federal assistance for near-term eligible projects using federal funds from the Airport Improvement Program, as shown on the ALP; and
5. approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150/5370-2F *Operational Safety on Airports During Construction*.⁹

1.7 TIMEFRAME FOR IMPLEMENTATION OF THE PROPOSED ACTION

The Proposed Action cannot start until the FAA completes its evaluation of this NEPA EA. The FAA will determine whether it can issue a Finding of No Significant Impact (FONSI) and Record of Decision (ROD) based on the evaluation in this EA, or whether an Environmental Impact Statement (EIS) must be completed before a ROD can be considered. If a ROD is issued for the Proposed Action, then implementation of the Proposed Action can proceed.

1.8 DOCUMENT ORGANIZATION

This EA is organized into the following chapters:

Chapter 1: Purpose and Need - Chapter 1 provides an overview, background information, a brief description of the City's purpose and need for the Proposed Action, the FAA's purpose and need for the Proposed Action, and a brief description of the Proposed Action. This chapter also includes the requested Federal actions and the proposed timeline of the proposed improvements.

Chapter 2: Alternatives - This Chapter provides an overview of the identification and screening of alternatives considered as part of the environmental evaluation process.

⁹ Federal Aviation Administration, Advisory Circular 150/5370-2F, section 2-4, *Operational Safety on Airports During Construction*, faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1019533

Chapter 3: Affected Environment - This Chapter describes existing environmental conditions within the project study area as well as describes the past, present, and reasonably foreseeable actions at the Airport (i.e., cumulative actions).

Chapter 4: Environmental Consequences and Mitigation - Chapter 4 describes the potential environmental effects that the No Action, Proposed Action, and each reasonable alternative would have on the Airport environs per FAA Order 5050.4B.¹⁰¹¹

Pursuant to 40 CFR 1508.7, as well as Council on Environmental Quality (CEQ) guidance documents¹², this chapter also discusses cumulative impacts. That discussion focuses on the effects of the Proposed Action, in combination with the effects on the same resources, due to past, concurrent, and reasonably foreseeable actions.

Where appropriate, the EA contains graphics and tables to clarify the analysis presented in this chapter.

Chapter 5: Consultation and Coordination – Chapter 5 outlines the various agencies and individuals contacted as part of the NEPA process.

Chapter 6: Abbreviations – List of abbreviations used in this EA.

Chapter 7: References – This Chapter contains a list of references used in the development of this EA.

Chapter 8: List of Preparers – Chapter 8 contains a list of names and the qualifications of individuals that prepared, contributed to, and reviewed this EA.

Appendices: The appendices present relevant material and technical reports that were developed, and used as part of this EA's preparation.

¹⁰ Federal Aviation Administration, Order 5050 4B, Chapter 5, Section B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 26, 2006.

¹¹ 40 CFR Part 1508.7, *Cumulative Impacts*, July 2010.

¹² Council on Environmental Quality Executive Office of the President, *Considering Cumulative Effects*, January 1997, and *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*, June 24, 2005.

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CHAPTER 2 ALTERNATIVES

2.1 INTRODUCTION

As the Airport Sponsor, it is the City of Hayward's responsibility to provide a safe and efficient environment for air traffic at the Airport. This chapter evaluates reasonable alternatives to meet FAA guidelines while enhancing the overall safety of the Airport environment. The evaluation describes details of the alternatives and includes the following:

- description of the alternatives evaluation process;
- identification of the reasonable alternatives considered;
- description of the screening criteria that eliminated some alternatives from further analysis; and
- identification of the reasonable alternatives that were screened and retained for further consideration.

The Council on Environmental Quality regulations (40 CFR Section 1502.14) for implementing NEPA, require that Federal agencies perform the following tasks:

- rigorously explore and objectively evaluate all reasonable alternatives and briefly discuss reasons why other alternatives were eliminated;
- devote substantial treatment to each alternative considered in detail, including the Proposed Action, so reviewers may evaluate their comparative merits;
- include reasonable alternatives not within the jurisdiction of the lead agency; and
- include the alternative of "No Action".

Federal and FAA guidelines concerning the environmental review process require that a range of reasonable and practicable alternatives that might accomplish the objectives of the Purpose and Need be identified and evaluated, along with the No Action Alternative. Such an examination ensures that an alternative that addresses a project's purpose and need, that might enhance environmental quality, or that would have less detrimental environmental effects, has not been prematurely dismissed from consideration. In the development of this EA, a total of seven on-airport and off-airport/operational alternatives were evaluated.

Off-Airport alternatives identified include:

- Other Modes of Transportation; and
- Use of Other Area Public Airports.

On-Airport alternatives identified include:

- No Action Alternative;
- Alternative 1;
- Alternative 2; and
- Alternative 3.

Table 2-1 outlines which project elements, as previously described in **Chapter 1, Purpose and Need** are included with each on-Airport alternative. **Section 2.3** provides a detailed discussion of each reasonable alternative considered within this chapter.

Table 2-1
PROJECT COMPONENT COMPARISON OF ON-AIRPORT ALTERNATIVES

Proposed Project Elements	Alternative 1	Alternative 2	Alternative 3
Sulphur Creek			
Box Culvert	x	-	x
Grate	-	x	x
Airfield Drainage Improvements	x	x	x

SOURCE: RS&H, 2014.
PREPARED BY: RS&H, 2014.

This alternatives analysis does not present an evaluation of other development projects depicted on the ALP. Other development projects identified on the ALP have independent utility from the Proposed Action and may or may not be implemented by the City of Hayward within the time frame of this EA. Those projects, when necessary, would need to be justified and evaluated in accordance with the appropriate NEPA documentation (e.g., Federal - Categorical Exclusion, Environmental Assessment or Environmental Impact Statement). The cumulative effects of these reasonably foreseeable projects are considered in **Chapter 4, Environmental Consequences and Mitigation**.

2.2 ALTERNATIVES EVALUATION PROCESS

The evaluation of alternatives first considers whether an alternative could meet the Purpose and Need for the Proposed Action.

2.2.1 Purpose and Need Screening Considerations

In accordance with FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*¹⁵, this EA is required to evaluate a reasonable and practicable range of alternatives “to achieve the Purpose of the Project.” The Purpose and Need, as previously discussed in **Chapter 1, Purpose and Need**, includes the following:

- culvert, fill, and grade segments of Sulphur Creek to eliminate topographic inconsistencies in the AOA, to prevent aircraft that might veer off the runway from plunging into Sulphur Creek, and to reduce wetlands that attract birds and wildlife hazardous to the safety of the AOA; and
- grade infield areas of the airfield to promote drainage and eliminate topographic depressions that support ponding of water which could attract hazardous wildlife and could be hazardous to aircraft in the event one veers off the runway.

¹⁵ FAA Order 1050.1E, Paragraph 405d, *Environmental Impacts: Policies and Procedures*, March 2006.

2.2.1.1 Protect Aircraft Veering Off Runways From Damage

The FAA Runway Safety Action Team (RSAT) indicated that HWD should modify the areas adjacent to Runway 10L-28R and 10R-28L to eliminate open, unculverted sections of Sulphur Creek so that if an aircraft veers off a runway at HWD, it could not plunge into Sulphur Creek. Alternatives that provides a surface over Sulphur Creek that would support aircraft would meet that purpose.

2.2.1.2 Improve Airfield Drainage

The infield areas between runways and taxiways on the northwest end of the AOA have slowly eroded over time and need to be re-graded in order to eliminate the accumulation of water during precipitation events. Each alternative is assessed on its ability to improve topographic inconsistencies and drainage inefficiencies within the northwest AOA of the Airport. All alternatives would reduce the quantity of debris that could enter the creek and would improve drainage conveyance capability of Sulphur Creek. Alternatives that “significantly improve” drainage (i.e., remove ponding water and would not permit water to back up into the AOA) are considered more reasonable and practicable compared to an alternative that offers less protection to the AOA from flooding events.

2.2.1.3 Reduce Wildlife Hazards

As per FAA Advisory Circular (AC) 150/5200-33B, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports.¹⁶ An alternative that meets the guidance within FAA AC 150/5200-33B and improves safety within the Airport’s AOA would be more reasonable and practicable compared to an alternative that would not correct the existing wildlife attractants on the Airport.¹⁷ Each alternative is designated with a degree of wildlife hazard attractant reduction, including: (1) high level of reduction (i.e., wildlife attractant significantly reduced); (2) moderate level of reduction (i.e., reduces the attraction of the wildlife hazard); (3) low level of reduction (i.e., least amount of wildlife reduction); or (4) no reduction of wildlife attractants. Alternatives that result in a high level of wildlife hazard reduction would satisfy the Purpose and Need.

FAA Advisory Circular (AC) 150/5200-33B recommends for airports such as HWD that serve turbo-jet aircraft that hazardous wildlife attractants not be located within 10,000 feet from the airport’s AOA and that a five-mile distance be maintained between hazardous wildlife attractants and aircraft on approach to, departing from, and/or circling the airport. For this project, an alternative that removes attractants of hazardous wildlife within the AOA is considered more reasonable and practicable than an alternative that continues to provide attractants to hazardous wildlife within the AOA, such as wildlife resting or feeding areas.

2.2.2 Operational Efficiency Screening Considerations

Operational efficiency screening considerations were designed to determine which alternatives met the Purpose and Need in addition to being considered the most reasonable and practicable with respect to operational considerations...

¹⁶ FAA AC 150/5200-33B, Section 2-4, Subsection a, *Hazardous Wildlife Attractants On or Near Airports*, August 2007.

¹⁷ The FAA defines “prudent” as “rationale judgment”, FAA Order 50504B paragraph 1007, section (e)(4)(b) *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.

2.2.2.1 Operational Efficiency

Consideration was given to the complexity of staging, phasing, construction and maintenance activities, and whether or not an alternative would allow airfield operations to continue uninterrupted. FAA AC 150/5370-2F, *Operational Safety on Airports During Construction*, states the following:

- No construction may occur with the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances.
- No construction may occur within the taxiway safety area (TSA) while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction.
- The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available.¹⁸

For operational screening considerations and for comparison purposes, each alternative is designated a ranking of low, moderate, or high (or a combination of two rankings) based on the potential to adversely affect operational efficiency at the Airport. An alternative requiring additional maintenance activities and increased costs to Airport users is considered less desirable.

2.3 DESCRIPTION OF ALTERNATIVES

The following sections describe the reasonable off- and on-airport alternatives considered for evaluation in the screening analysis.

2.3.1 Off-Airport Alternatives

Off-airport alternatives are included within this EA for compliance with CEQ regulations because Federal decision-makers are required to include reasonable alternatives not within the jurisdiction of the lead agency.¹⁹

An initial component of the evaluation of alternatives involved evaluating the possible use of other general aviation airports in the San Francisco Bay area to serve the area's aviation needs.

2.3.2 On-Airport Alternatives

The following sub-sections describe each reasonable on-Airport alternative. Figures are also included for visual reference.

¹⁸ FAA Order 1050/5370, *Operational Safety on Airports During Construction*, Section 221.

¹⁹ CEQ, 40 CFR Section 1502.14.

2.3.2.1 Alternative 1

Alternative 1 includes improvements to Sulphur Creek and infield drainage (see **Figure 2-1**). Alternative 1 includes the construction of a box culvert for the three segments of Sulphur Creek within the AOA, between Taxiway A and Taxiway Z. The area above the culvert portion of the creek would be covered with soil, graded, and seeded. Infield grading and drainage improvements associated with Alternative 1 would be conducted in accordance with FAA AC 150/5320-5C, *Surface Drainage Design*, would include conveyance facilities, berms, and outfalls that would facilitate improved drainage within the AOA.²⁰

2.3.2.2 Alternative 2

Alternative 2 includes the construction of load-bearing grates that would be constructed over the existing open segments of Sulphur Creek within the AOA (see **Figure 2-2**). Support walls would be constructed along the sides of each wetland segment and at-grade open-air grates would be constructed atop. Infield grading and drainage improvements associated with Alternative 2 would be conducted in accordance with FAA AC 150/5320-5C *Surface Drainage Design*, would include conveyance facilities, berms, and outfalls that would facilitate improved drainage within the AOA.

2.3.2.3 Alternative 3

Alternative 3 includes a combination of grating and culvert improvements to Sulphur Creek (see **Figure 2-3**). This alternative includes the construction of a box culvert for the three segments of Sulphur Creek within the OFZ of Runways 10R-28L and 10L-28R. The box culvert of Sulphur Creek within the OFZ would be built at grade, covered with soil, graded and seeded. The segment of the creek between Runway 10L-28R and Taxiway A, outside of the OFZ, would include support walls along the edge of the wetland and covered with at-grade load-bearing grates. Infield grading and drainage improvements associated with Alternative 1, in accordance with FAA's *Surface Drainage Design* would include conveyance facilities, berms, and outfalls that would facilitate improved drainage within the AOA.

2.3.2.4 No Action Alternative

The No Action Alternative involves no improvements at the Airport. Under the No Action Alternative Sulphur Creek would remain an open channel within the AOA and flood-induced pavement damage would continue.

²⁰ FAA AC 150/5320-5C, *Surface Drainage Design*, http://www.faa.gov/airports/resources/advisory_circulars/, September 2006.

Figure 2-1
ALTERNATIVE 1



- Legend**
- Area of Potential Ground Disturbance
 - Existing Sulphur Creek Culvert
 - █ Grading Areas
 - █ Airport Property
 - █ Area to be Culverted and Graded
 - █ Sulphur Creek

Figure 2-2
ALTERNATIVE 2



Source: ESRI, 2013; RS&H, 2013 Prepared By: RS&H, 2013

0 550 1,100 2,200 Feet

Legend

- Area of Potential Ground Disturbance
- Existing Sulphur Creek Culvert
- █ Grading Areas
- █ Airport Property
- █ Area to be Grated and Graded
- █ Sulphur Creek

Figure 2-3
ALTERNATIVE 3



Legend

- Area of Potential Ground Disturbance
- Airport Property
- Existing Sulphur Creek Culvert
- Area to be Grated and Graded
- Area to be Culverted and Graded
- Sulphur Creek
- Grading Areas

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2.4 EVALUATION OF ALTERNATIVES

Each reasonable alternative was evaluated based on the screening criteria described in **Section 2.2. Table 2-2** at the end of this section summarizes the evaluation of the reasonable and practicable alternatives in this EA.

2.4.1 Alternatives Screening Evaluation

The following sections describe the Purpose and Need screening considerations used to select a Preferred Alternative.

2.4.1.1 Off-Airport Alternatives

Off-Airport Alternatives (i.e., Other Modes of Transportation or Use of Other Area Public Airports) would not meet the Purpose and Need to eliminate the open, unculverted sections of Sulphur Creek so that if an aircraft veers off a runway at HWD, it could not plunge into Sulphur Creek. These alternatives would not remove or reduce the attraction of wildlife from the segments of Sulphur Creek within the Airport's AOA. The Off-Airport Alternatives also would not improve infield topographic inconsistencies or drainage within the AOA and RSA. In addition, FAA and the Airport do not have the authority to divert air transportation activity from the Airport to other area airports or compel Airport users to use other modes of transportation. Therefore, the Off-Airport Alternatives were eliminated from further consideration in this EA.

2.4.1.2 On-Airport Alternatives

All three on-Airport alternatives would enclose Sulphur Creek with culverts or grates to prevent aircraft that veer off the runway from plunging into Sulphur Creek. All three on-Airport alternatives also include grading of the areas between runways and taxiways in accordance with FAA AC 150/5320-5C to provide a smooth surface to minimize damage to aircraft that veer off the runway and to enhance drainage at HWD.

Alternative 1

Alternative 1 would improve the safety of the airfield by completely enclosing the three segments of Sulphur Creek within the AOA. Construction of enclosed, at-grade box culverts of Sulphur Creek within the AOA would be constructed in compliance with FAA AC 150/5300, *Airport Design*.²² The elimination of the steep terrain drop-off within the AOA would result in an airfield safety improvement and would satisfy an open item from the FAA RSAT review. Implementation of Alternative 1 would reduce the attraction of birds by eliminating or greatly reducing feeding and resting habitats in the Sulphur Creek segments located in the AOA.

Alternative 1 would significantly reduce wildlife attractants within the AOA and would significantly improve topographic inconsistencies and drainage within the AOA and RSA. Implementation of Alternative 1 would most fully meet the Purpose and Need of the Proposed Action.

Implementation of the Alternative 1 may have a minor temporary effect on the operational efficiency of HWD and require partial runway or taxiway closures, or temporary use of declared distances or temporary redesignation of RSA, TSA, or object free areas during construction. Alternatives 1, 2, and 3 would all require construction in the same areas of HWD. Therefore,

²² FAA AC 150/5300-13, *Airport Design*, www.faa.gov, September 2011.

any temporary impacts on the operational efficiency of HWD would be the same under Alternatives 1, 2, or 3.

Alternative 2

Alternative 2 would improve the safety of the airfield by constructing at-grade load-bearing grates over all three segments of Sulphur Creek within the AOA while maintaining a natural bottom environment that would result in a moderate reduction of habitat attractive to wildlife hazardous to aircraft within the AOA. Smaller animals within Sulphur Creek would continue to use the creek because the grates would allow continued access. Grating would not provide sufficient daylighting needed to support wetland flora. The grating would deter larger animals (e.g., geese) from foraging and resting within this wildlife hazard attractant. However, Alternative 2 would not reduce habitat for wildlife hazardous to aircraft operations as much as Alternatives 1 or 3 because smaller wildlife species, such as rodents and small birds, could continue to use the creek channel as habitat. These small rodents and other prey species would have the potential to inhabit these segments of Sulphur Creek and could move outside the grating into the AOA or RSA and attract large, hazardous predatory birds that are potential wildlife-aircraft strike hazards.

Therefore, Alternative 2 was considered to produce a low reduction in habitat for wildlife hazardous to air operations. Alternative 2 may be preferred by some regulatory agencies, such as the San Francisco Regional Water Quality Board (RWQCB), which recommended streambed enhancement, rather than streambed enclosure.²³ However, the continued existence of a wildlife hazard does not meet the Purpose and Need.

Implementation of the Alternative 2 may have a minor temporary effect on the operational efficiency of HWD and require partial runway or taxiway closures, or temporary use of declared distances or temporary redesignation of RSA, TSA, or object free areas during construction. Alternatives 1, 2, and 3 would all require construction in the same areas of HWD. Therefore, any temporary impacts on the operational efficiency of HWD would be the same under Alternatives 1, 2, or 3.

As Alternative 2 does not fully meet the Purpose and Need for the Proposed Action it was not analyzed in Chapter 4, **Environmental Consequences**.

Alternative 3

Alternative 3 is a combination of Alternatives 1 and 2. Implementation of Alternative 3 would involve grating a 0.05-acre area of Sulphur Creek that is outside the Runway 10R-28L OFZ. The grated segment would maintain a natural bottom. However, grating needed to maintain safety standards in the event aircraft veer over the grate would not allow sufficient daylighting for wetland flora to continue to grow. The enclosed box culvert segments would eliminate wildlife attractants within the AOA. The grating would deter larger birds (e.g., geese) from foraging and resting within Sulphur Creek. However, small rodents or other prey species would have the potential to inhabit this segment of Sulphur Creek and could move outside of the grating into the AOA or RSA and attract large, hazardous predatory birds that present potential wildlife-aircraft strike hazards.

²³ City of Hayward, Public Works Department, *Request for Qualifications, Hayward Executive Airport*, <http://www.ci.hayward.ca.us/departments/publicworks/HEA/docs/2010/RFQ%20Sulphur%20Creek%20Improvements.pdf>.

Alternative 3 would result in a moderate reduction of wildlife attractants within the AOA, but would not fully meet the project purpose and need. Alternative 3 would improve topographic inconsistencies and drainage within the AOA and RSA. The presence of small openings associated with the grated section of Sulphur Creek would attract and allow small wildlife to inhabit the grated areas of the creek. The attraction of smaller animals could attract larger predatory avian species that would be hazardous to aircraft operations.

Implementation of the Alternative 3 may have a minor temporary effect on the operational efficiency of HWD and require partial runway or taxiway closures, or temporary use of declared distances or temporary redesignation of RSA, TSA, or object free areas during construction. Alternatives 1, 2, and 3 would all require construction in the same areas of HWD. Therefore, any temporary impacts on the operational efficiency of HWD would be the same under Alternatives 1, 2, or 3.

As Alternative 3 does not fully meet the Purpose and Need for the Proposed Action it was not analyzed in detail in Chapter 4, **Environmental Consequences**.

No Action Alternative

The No Action Alternative involves no improvements at the Airport. Under the No Action Alternative Sulphur Creek would remain an open channel within the AOA. Aircraft that veered off the runway would still have the potential to plunge into Sulphur Creek. The uneven ground that contributes to drainage issues and the potential for damage to aircraft that veer off the runway would still be present. However, the No Action Alternative was carried through to the next level of screening, as required by NEPA.

Comparing Alternatives 1 and 3

Alternative 1 was retained for further analysis because it would result in the highest level of wildlife hazard reduction. Since the environmental impacts anticipated under Alternative 3 were very similar to impacts under Alternative 1, and Alternative 3 did not fully meet the Purpose and Need of the Proposed Action, Alternative 3 was not analyzed in detail in Chapter 4, **Environmental Consequences**.

2.5 NO ACTION ALTERNATIVE

The No Action Alternative involves no improvements at the Airport. Under the No Action Alternative Sulphur Creek would remain an open channel within the AOA. This EA retains the No Action Alternative as required by 40 CFR 1502.14(d) of CEQ Regulations, which requires that the No Action Alternative be considered in all NEPA analyses.²⁴ The No Action Alternative assumes that none of the reasonable alternatives would be developed and there would be no alteration of the existing facilities.

Although the proposed improvements would not occur under the No Action Alternative, continued airfield maintenance would be necessary to ensure that the airfield remains functional for aircraft operations. This maintenance would entail activities such as filling of cracks, patching of failing pavement, and clearing and trimming wetland segments of Sulphur Creek, as needed. Although the No Action Alternative is not considered a reasonable alternative as a result of this alternatives analysis, it is further considered in this EA, as required by CEQ regulations.

²⁴ 40 CFR 1502.14(d), *Alternatives Including the Proposed Action*. March 1970.

2.6 PREFERRED ALTERNATIVE

Alternatives for the proposed Airport improvements were evaluated within this chapter of the EA. Alternative 1 is identified as the City of Hayward's Preferred Alternative and is further assessed for potential environmental impacts in **Chapter 4, Environmental Consequences and Mitigation** of this EA. Alternative 1 would meet the purpose and need for the Proposed Action at HWD by:

- protecting aircraft from damage and passengers from injury if an aircraft veered off a runway by placing all portions of Sulphur Creek between runways and taxiways at HWD within culverts; and
- reducing habitat attractive to wildlife hazardous to aircraft operations to a greater extent than Alternatives 2 or 3.

Alternative 1 will subsequently be referred to as the Proposed Action in this Environmental Assessment.

Table 2-2
EVALUATION OF ALTERNATIVES

Screening Criteria	No Action	Off-Airport Alternatives	Alternative 1	Alternative 2	Alternative 3
			Culvert	Grating	¼ Culvert ¼ Grate
Protect aircraft that veer off runways from damage	No	No	Yes	Yes	Yes
Does the alternative improve the poorly drained areas within the northwest portion of the airfield?	No Improvement	No Improvement	Greatest Improvement	Least Improvement	Moderate Improvement
What is the level of reduction for the existing wildlife hazard within the AOA?	No Reduction	No Reduction	High	Low	Moderate
Would implementation of the alternative affect the operational efficiency of the airport	No	No	Minor temporary impact	Minor temporary impact	Minor temporary impact
Is the alternative practical and carried forward for further environmental analysis in Chapter 4, Environmental Consequences and Mitigation, of this EA?	Yes ^{/a/}	No	Yes	No	No

^{/a/} As per CEQ regulations, the No Action Alternative was retained for detailed environmental analysis for baseline comparative purposes.

SOURCE: RS&H, 2014.
PREPARED BY: RS&H, 2014

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CHAPTER 3 AFFECTED ENVIRONMENT

This chapter provides a description of the existing conditions within the study area. The environmental resource categories are organized as identified in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*³⁰ and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.³¹ The Affected Environment at Hayward Executive Airport includes all areas within Airport property that have the potential to be affected as a result of implementation of the Proposed Action.

The potential environmental impacts of the No Action and Proposed Action and reasonable alternatives retained for analysis of environmental impacts are presented in **Chapter 4, Environmental Consequences and Mitigation**, of this EA.

3.1 INTRODUCTION

As described in **Chapter 1, Purpose and Need**, the Airport is located in Hayward, California, approximately 15 miles south of the City of Oakland. Existing conditions were evaluated within two study areas, which were developed for this EA. The Airport Study Area (ASA) and the Area of Potential Ground Disturbance are presented in **Figure 3-1**.

3.1.1 Airport Study Area

The ASA includes all areas of Airport property and is identical to the Airport property boundary. Since the Proposed Action would not alter the quantity of operations or the fleet mix of based aircraft at the Airport, the ASA is limited to the Airport property boundary. The ASA and Airport property are both referenced interchangeably throughout this document. The ASA is presented in **Figure 3-1**.

3.1.2 Area of Potential Ground Disturbance

The Area of Potential Ground Disturbance is the geographical areas that has the potential to be directly affected by implementation of the Proposed Action, including ground disturbing activities associated with the construction of the Proposed Action. The Area of Potential Ground Disturbance is presented in **Figure 3-1**.

3.2 RESOURCES NOT AFFECTED

The Proposed Action is not a capacity enhancing action and would not directly increase or decrease operations at the Airport. The Proposed Action is intended to reduce the potential damage to aircraft that veer off the runways at HWD, improve drainage, and reduce habitat for wildlife hazardous to air operations.

The Proposed Action would not affect the following environmental resources categories, as described in FAA Order 1050.1E, Change 1:

³⁰ FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, 2006.

³¹ FAA Order 5050.4B, *National Environmental Policy Act Implementing Instructions for Airport Actions*, 2006.

- Coastal Resources;
- Compatible Land Use;
- Section 4(f) Resources;
- Farmlands;
- Light Emissions and Visual Surroundings;
- Natural Resources and Energy Supply;
- Noise;
- Secondary (Induced);
- Wild and Scenic Rivers.

Brief explanations of why adverse effects to these resource categories would not reasonably occur are provided in the subsections below. In accordance with guidance provided in FAA Orders 5050.4B and 1050.1E, detailed analysis of these resources is not required or included within **Chapter 4, Environmental Consequences and Mitigation**.

3.2.1 Coastal Resources

3.2.1.1 Coastal Barriers

Federal activities involving or affecting coastal barrier resources are governed by Coastal Barriers Resources Act. As of 2006, activities affecting coastal barrier resources are also governed by the California Coast Act of 1976. The Proposed Action and No Action Alternative would not affect coastal barrier resources. Therefore, the provisions of the Coastal Barriers Resources Act do not apply to the No Action Alternative or the Proposed Action.

3.2.1.2 Coastal Zone Management Program

The San Francisco Bay Conservation and Development Commission (BCDC) is the agency responsible for administering the provisions of the Federal Coastal Zone Management Act of 1972 under the State of California's approved Coastal Zone Management Program (CZMP). BCDC's jurisdiction extends over all tidal areas of SF Bay and a shoreline band, which extends 100 feet inland from the mean high tide line. Within this area, BCDC has permitting responsibility for all SF Bay filling, dredging, or substantial change in use of land, water, or structures.

The Airport facilities are located approximately 2,800 feet east of Hayward Regional Shoreline and the Proposed Action is outside the jurisdiction of BCDC. The Proposed Action has no potential to affect coastal resources and no further coordination regarding coastal issues is required.

3.2.2 Compatible Land Use

The alternatives under consideration would occur entirely on Airport property; therefore, the Proposed Action would not directly affect off-Airport land uses. The Proposed Action would not include activities that would indirectly affect compatible land uses adjacent to the Airport property. Activities that can influence aviation-related noise and affect land uses include airport development actions to accommodate fleet mix changes or the number of aircraft operations, air traffic changes, or new approaches made possible by new navigational aids. Since the Proposed Action would not involve activities that would influence aviation-related noise or cause other off-airport effects, land use compatibility in the vicinity of the Airport would not be affected. The City of Hayward has provided a Land Use Assurance letter (see **Appendix D**) to the FAA stating that the City will restrict land uses in the vicinity of HWD to activities and purposes compatible with normal airport operations, including the landing and takeoff of aircraft.

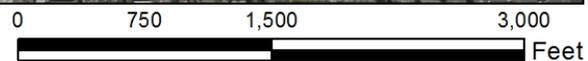
Figure 3-1
EA STUDY AREAS



Source: ESRI, 2013; RS&H, 2013 Prepared By: RS&H, 2013

Legend

- Airport Study Area
- - - Existing Sulphur Creek Culvert
- Sulphur Creek
- - - Area of Ground Disturbance



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3.2.3 Department of Transportation Act: Section 4(f) and Section 6(f) Resources

Section 4(f) of the U.S. Department of Transportation Act of 1966, as amended (49 United States Code [U.S.C.] 303, and 23 U.S.C. 138) requires a Section 4(f) analysis of any federally funded transportation project if the project proposes to use property from a publicly owned park, recreation area, wildlife or waterfowl refuge area, or any significant historic site. The Secretary of Transportation may approve a transportation project requiring the use of Section 4(f) land only if:

- there is no practicable alternative to using that land; or
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuges, or historic sites resulting from the use.

For Section 4(f) purposes, use includes actual physical takings of Section 4(f) lands as well as actions that result in adverse indirect impacts, or constructive use. Constructive use only occurs if Section 4(f) lands are substantially impaired by a project action, which includes substantially diminishing the activities, features, or attributes of the Section 4(f) resource that contribute to its significance or enjoyment.

As shown in **Figure 3-2**, and presented in **Table 3-1** there are two Section 4(f) resources located within the ASA (Kennedy Park and Skywest Golf Course).

3.2.3.1 Kennedy Park

Kennedy Park is a 13.3-acre park on Airport property and is owned and operated by Hayward Area Recreation and Park District (HARD). This local community park is north of the Airport's airside facilities, located at 19501 Hesperian Boulevard. Kennedy Park is a large children's park with a varied of playing opportunities, including the Triple Pines Ranch Petting Zoo and train rides. Other activities at Kennedy Park include a multi-use field of open lawn areas and casual play, four lighted tennis courts, and two horseshoe pits that serves the City of Hayward Area Recreation and Park District.

3.2.3.2 Skywest Golf Course

Built in 1995, the Skywest Golf Course is a 125-acre, 18-hole championship golf course that is open to the public and operated by the HARD. The golf course is located on Airport property northwest of the airfield, is considered to be a wildlife hazard attractant, and is a significant source of income for the Airport.

3.2.3.3 Conclusions

Since the Proposed Action will not result in any physical impacts or noise impacts to either of these properties or anywhere beyond the HWD boundaries, there is no potential for the Proposed Action to affect any Section 4(f) resources and no further analysis is required.

Figure 3-2
SECTION 4(f) RESOURCES IN THE AIRPORT STUDY AREA



Source: ESRI, 2013; RS&H, 2013 Prepared By: RS&H, 2013

Legend

- Airport Property
- Existing Sulphur Creek Culvert
- Sulphur Creek
- Section 4(f) Properties
- Area of Ground Disturbance

Table 3-1
SECTION 4(f) RESOURCES

Name	Location	Acres	Facilities
Kennedy Park	19501 Hesperian Blvd.	13.3	Petting Zoo, Tennis Courts, Horseshoe pits, Open area
Skywest Golf Course	1401 Golf Course Rd.	125.0	Golf Course

SOURCE: Hayward Area Recreation & Park District, District Recreation & Parks Master Plan, June 2006.
PREPARED BY: RS&H, 2011.

3.2.4 Farmlands

According to the Natural Resource Conservation Service (NRCS), the ASA contains prime farmland soil types, including Botella loam, Clear Lake clay, Danville silty clay loam, and Willows clay. These soil types are considered prime farmland soil types if they are irrigated and drained.³³

According to 7 CFR Part 658.2, the Farmland Protection Policy Act (FPPA) does not apply to land already committed to "urban development or water storage" (i.e., Airport developed areas), regardless of its importance as defined by NRCS.³⁴ In addition, there is no active farming on Airport property and the area has been extensively developed with airside facilities (runway and taxiways) and landside facilities (hangars). Therefore, implementation of the Proposed Action has no potential to affect prime or unique farmlands and no additional analysis is required.

3.2.5 Light Emissions and Visual Setting

3.2.5.1 Light Emissions

Airfield lighting and visual navigational aids at the Airport consist of Medium Intensity Runway Lights (MIRLs), Precision Approach Path Indicator (PAPI), Visual Approach Slope Indicators (VASIs), and Runway End Identifier Lights (REILs). A MIRL system consists of a configuration of lights that define the lateral and longitudinal limits of the usable landing area. Runways 10L and 28R are equipped with four-light PAPIs, located on the left side of either runway. Runways 10R and 28L are equipped with a four-light VASI, which are located on the left side of Runway 28L and on the right side of Runway 10R. The REIL system is used to provide rapid and positive identification of the approach end of the runway threshold. Airfield lighting also includes taxiway lighting to guide aircraft to and from the taxiways and runways. Lighting associated with the airfields is generally low to the ground and low intensity.

Terminal lighting includes systems to illuminate both the internal and external areas of the terminal. Interior lighting illuminates the Airport for usage by passengers and employees. Exterior lighting includes parking areas, aprons, airport roadways, and transfer areas.

Illuminated areas not a part of the Airport's landside facilities include various businesses and warehouses southwest of the ASA. In addition, the Airport is encircled by major highways, interstates, and other local roads illuminated by streetlights.

Installing additional box culverts on Sulphur Creek and re-grading portions of the Airport will not result in additional light emissions. The Proposed Action may require temporary nighttime construction to limit the duration of any potential runway or taxiway closure. Nighttime construction efforts would require lighting. However, as the nearest light-sensitive land uses to the Proposed Action are located approximately 1,600 feet to the northwest and are separated from the Proposed Action by intervening vegetation and Skywest Golf Course, this nighttime lighting would have no potential to affect nearby light-sensitive land uses.

3.2.5.2 Visual Setting

The Airport is located within an urban landscape. Surrounding the ASA are residential and educational land uses to the north, residential land uses east of Hesperian Boulevard, and commercial/industrial and warehouse distribution facilities south and southwest of the Airport.

³³ NRCS, *Web Soil Survey*, <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>, accessed December 2013.

³⁴ 7 CFR Part 658.2, *Definitions*, <http://www.gpo.gov/fdsys/pkg/CFR-2010-title7-vol6/pdf/CFR-2010-title7-vol6-part658.pdf> Accessed: May 5, 2014.

The Proposed Action would occur completely on Airport property and would not alter the visual setting of the Airport.

3.2.6 Natural Resources and Energy Supply

The Proposed Action would not change the energy requirements or natural resources usage necessary to operate the Airport or change the demand of energy or natural resources for Airport users. Therefore, implementation of the Proposed Action would not affect the energy supplies and natural resources consumption associated with on-going Airport operations. Energy and natural resources uses associated with construction of the Proposed Action are addressed in **Section 4.3, Construction Impacts**.

3.2.7 Noise

This section of the EA addresses the existing sources of noise at the Airport and the methodologies used to determine the extent of existing noise exposure.

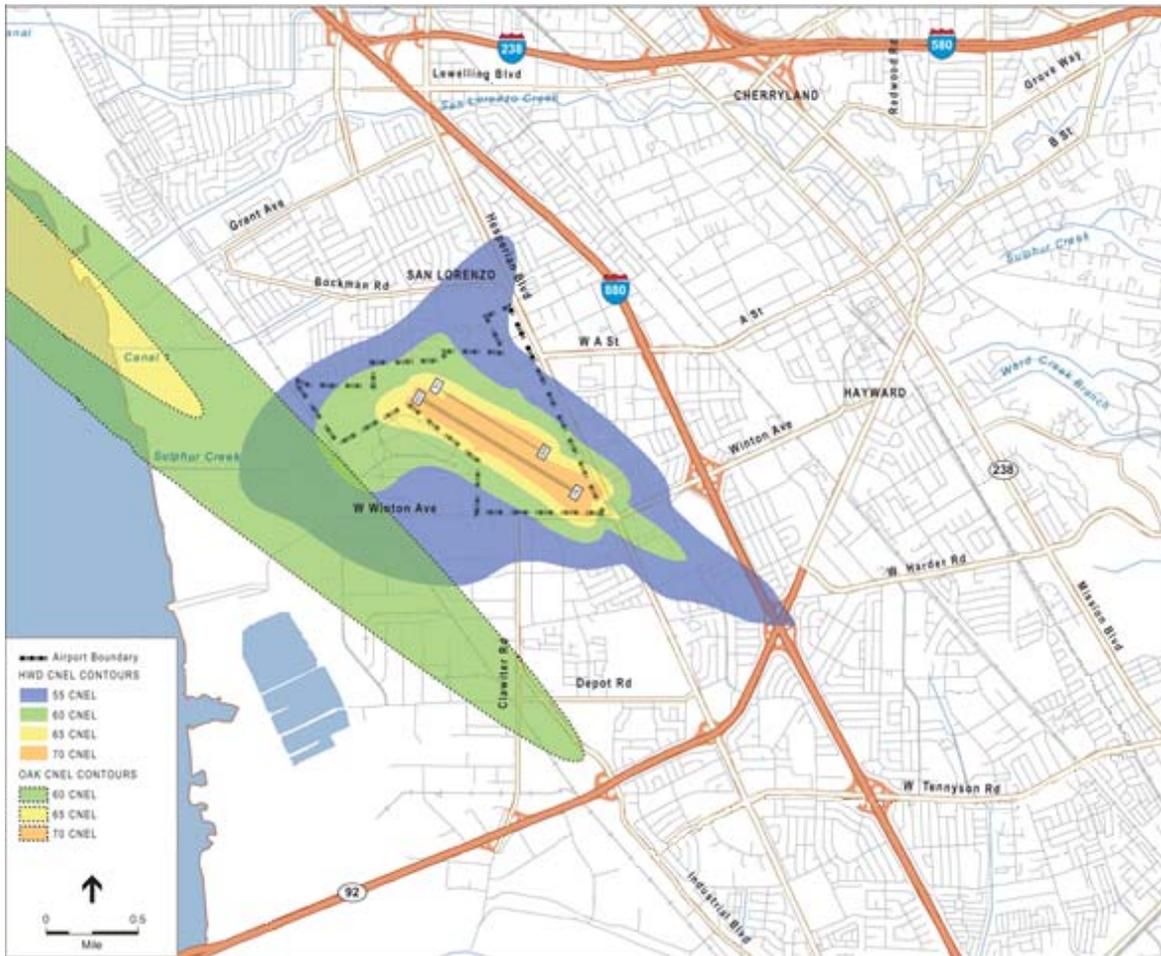
3.2.7.1 Existing Noise Environment

The closest existing noise sensitive land use to the project site is a residential parcel 1,600 feet to the north of the Airport, separated by vegetated buffers and Skywest Golf Course. The existing noise environment surrounding the Airport experiences approximately 87,000 annual aircraft operations at HWD, as shown in **Table 1-1**.^{35,36} Based on these operational figures, noise contours were developed through the use of the Integrated Noise Model (INM) version 7.0b for the Airport Land Use Compatibility Plan completed in 2010. FAA Order 1050.1E, Appendix A, paragraph 14.1a identifies the Community Noise Equivalent Level (CNEL) decibel level (dB) as an appropriate measure of noise exposure in California, which is similar to the Day/Night Average Sound Level (DNL) in decibels that is used to measure noise exposure in other areas of the United States. The CNEL dB contours from the Airport Land Use Compatibility Plan were superimposed onto aerial photography to develop **Figure 3-3**, which presents the current extent of the CNEL 65, 70, and 75 dB noise contours for HWD and also shows existing CNEL dB contours for the Oakland International Airport, which is approximately 6 miles northwest of HWD. The Proposed Action would not result in increases in aircraft operations when compared to the No Action Alternative because implementation of the Proposed Action would not change the number of air operations at HWD. Therefore, a detailed evaluation of changes in noise exposure as a result of implementation of the Proposed Action is unnecessary as it would not be different from the No Action Alternative. The potential for the Proposed Action to generate construction-related noise is examined in **Section 4.3, Construction Impacts**.

³⁵ Federal Aviation Administration, Terminal Area Forecast, Available at: [https://aspm.faa.gov/wtaf/detail.asp?line=SELECT+*+FROM+WTAf+WHERE+SYSYEAR%3E^2005+AND+SYSYEAR%3C^2025+AND+\(LOC_ID^~HWD~\)](https://aspm.faa.gov/wtaf/detail.asp?line=SELECT+*+FROM+WTAf+WHERE+SYSYEAR%3E^2005+AND+SYSYEAR%3C^2025+AND+(LOC_ID^~HWD~))

³⁶ An operation as defined as one takeoff and one landing.

Figure 3-3
HAYWARD EXECUTIVE AIRPORT CNEL dB NOISE CONTOURS



Source: Hayward Executive Airport Land Use Compatibility Plan, 2010

3.2.7.2 Land Use Compatibility

The FAA, through guidance outlined in 14 CFR Part 150 and FAA Order 1050.1E, defines CNEL 65 as the threshold of noise compatibility that is normally acceptable for noise-sensitive land uses. **Table 3-2** identifies the sound levels associated with land uses that are typically compatible and non-compatible with different levels of noise exposure from air operations. The Proposed Action would not result in increased in aircraft operations when compared to the No Action Alternative because implementation of the Proposed Action would not change the number of air operations at HWD. Therefore, a detailed evaluation of changes in land use compatibility as a result of implementation of the Proposed Action is unnecessary as land use compatibility would not be different from the No Action Alternative.

Table 3-2
LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVEL (DNL)

	Below 65	65-70	70-75	75-80	80-85	Over 85
RESIDENTIAL						
Residential, other than mobile homes and transient lodging	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government 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
Communication	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 and 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
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Table 3-2 ^{/a/} (Continued)**LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVEL (DNL)**

- ^{/a/} The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses remains with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.
- Y (YES) - Land Use and related structures compatible without restrictions.
- N (No) - Land Use and related structures are not compatible and should be prohibited.
- NLR - Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure. 25, 30, or 35 Land use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of the structure.
- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (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 a 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 25 dB must be incorporated into the design and construction of portions of these 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 these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.
- (5) Land use compatible provided special sound reinforcement systems are installed.
- (6) Residential buildings require an NLR of 25.
- (7) Residential buildings require an NLR of 30.
- (8) Residential buildings not permitted.

3.2.8 Secondary (Induced)

As previously described, the Proposed Action is not a capacity enhancing project and would not directly result in an increase or decrease in air operations at the Airport or result in a change in the level of public services required by HWD. Implementation of the Proposed Action would not result in permanent increase in economic activity that could induce on- or off-Airport economic growth or development, or shifting patterns of population movement outside of the Airport boundary. In addition, the Proposed Action would occur on the existing airfield and would not result in the relocation or displacement of any homes or businesses.

3.2.9 Wild and Scenic Rivers

There are no rivers in the ASA or in the Airport vicinity that are listed in the Wild and Scenic River System. The closest river to the Airport designated as Wild and Scenic is the American (Lower) River, which is located approximately 75 miles northeast of the Airport. The closest water body to HWD identified on the National River Inventory (NRI) as a resource is Olema Creek, which is located approximately 25 miles to the northwest of the Airport.³⁷ Due to the substantial distance between these water bodies and the Airport, the Proposed Action has no potential to affect these water bodies and no further environmental impact evaluation is required.

3.3 RESOURCES POTENTIALLY AFFECTED

The Proposed Action and reasonable alternatives have the potential to affect the following environmental resources categories, as described in FAA Order 1050.1E, Change 1:

- Air Quality;

³⁷ National Wild and Scenic Rivers System, Designated Wild & Scenic Rivers, <http://www.rivers.gov/maps.html>, accessed December 2013.

- Construction Impacts;
- Floodplains;
- Fish, Wildlife, and Plants;
- Hazardous Materials, Pollution Prevention, and Solid Waste;
- Historic, Architectural, Archaeological, and Cultural Resources;
- Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety
- Water Quality;
- Wetlands; and
- Cumulative Impacts.

3.3.1 Air Quality

This section describes existing air quality conditions in the vicinity of the Airport and the ASA. Information on applicable air quality standards, current attainment/nonattainment designations, and existing air monitoring data are provided in this section. The potential air quality impacts associated with the Proposed Action are discussed in **Section 4.2**.

The Federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (U.S. EPA) to establish and periodically review National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. These national standards have been established for the following seven air pollutants, many of which have been enhanced by California standards: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter equal to or less than 10 micrometers (coarse particulates or PM₁₀), particulate matter equal to or less than 2.5 micrometers (fine particulates or PM_{2.5}), and lead (Pb). These standards are presented in **Table 3-3**.

In accordance with the federal CAA, all areas in the U.S. are designated with respect to the NAAQS. The region encompassing the Airport is listed as in attainment for most NAAQS criteria pollutants. However, according to the U.S. EPA Green Book, Alameda County is considered “marginal” for the 8-hour O₃ standard and is in “nonattainment” for the 2006 standard for PM_{2.5}.³⁸ The EPA designated the Bay Area as nonattainment for the PM_{2.5} standard on December 14, 2009 and the Bay Area Air Quality Management District (BAAQMD) was given three years to develop a State Implementation Plan (SIP) demonstrating that the Bay Area will achieve the revised standard by December 14, 2014. In December 2012, the State of California submitted a revision to the SIP and the Emission Inventory SIP Submittal was adopted after notice and public hearing in accordance with 40 CFR Section 51.102.³⁹ **Table 3-4** presents the attainment status for Alameda County for all criteria pollutants.

State and Local Air Quality

The California Air Resources Board (CARB) manages air quality, regulates mobile emissions sources, and oversees the activities of county and regional air districts within California. CARB also regulates local air quality by establishing California Ambient Air Quality Standards (CAAQS); vehicle emissions standards, and by conducting research, planning, and coordination activities. As previously described, California has adopted ambient standards that are more stringent than the NAAQS. **Table 3-5** presents the California Ambient Air Quality Standards.

³⁸ U.S. EPA, Green Book, *List of Currently Designated Nonattainment Areas for All Criteria Pollutants*, as of August 30, 2014, <http://epa.gov/oaqps001/greenbk/ancl.html>, accessed December 2013.

³⁹ State of California Air Resources Board, *THE 2012 PM_{2.5} EMISSION INVENTORY SUBMITTAL TO THE STATE IMPLEMENTATION PLAN FOR THE SAN FRANCISCO BAY AREA*. Available at: <http://www.arb.ca.gov/board/books/2012/120612/prores1237.pdf>

Table 3-3
NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant		Primary / Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO) ^{/a/}		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead ^{/b/}		primary / secondary	rolling 3- month average	0.15 µg/m ³ ^{/c/}	Not to be exceeded
Nitrogen Dioxide ^{/d/ /e/}		Primary	1-hour	100 ppb	98 th percentile, averaged over 3 years
		primary / secondary	annual	53 ppb ^{/f/}	Annual Mean
Ozone ^{/g/}		primary / secondary	8-hour	0.075 ppm ^{/h/}	Annual fourth-highest daily maximum 8-hour concentration averaged over 3 years
Particle Pollution ^{/i/}	PM _{2.5}	primary / secondary	Annual	15 µg/m ³	Annual mean, averaged over 3 years
			24-hour	35 µg/m ³	98 th percentile, averaged over 3 years
	PM ₁₀	primary / secondary	24 hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide ^{/k/}		primary	1-hour	75 ppb ^{/j/}	99 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

/a/ 76 Federal Register 54294, August 31, 2011.

/b/ 73 Federal Register 66964, November 12, 2008.

/c/ Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

/d/ 75 Federal Register 6474, February 9, 2010.

/e/ 61 Federal Register 52852, October 8, 1996.

/f/ The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

/g/ 73 Federal Register 16436, March 27, 2008.

/h/ Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

/i/ 71 Federal Register 61144, October 17, 2006.

/j/ Final rule signed June 2, 2010. The 1971 annual and 24-hour SO₂ standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

/k/ 75 Federal Register 35520, June 22, 2010.

SOURCE: EPA, 2014

The BAAQMD has jurisdiction over the Bay Area Air Basin, encompassing nine counties, including Alameda County. BAAQMD is responsible for ensuring that federal and state air quality standards are met by monitoring ambient air pollutant levels throughout the region and implementing strategies to attain the standards. The Association of Bay Area Governments, Metropolitan Transportation Commission, county transportation agencies, cities and counties, and various nongovernmental organizations are also involved in managing air quality in the region.

Under the California Clean Air Act, patterned after the Federal CAA, areas have also been designated as attainment or nonattainment with respect to the CAAQS. With respect to these standards, Alameda County is presently designated as a nonattainment area for ozone, PM₁₀, and PM_{2.5}, and attainment/unclassified for CO, NO₂, SO₂, and lead.

Table 3-4
CURRENT ATTAINMENT STATUS FOR ALAMEDA COUNTY /a/

Pollutant	NAAQS Designation	CAAQS Designation
Carbon monoxide (CO)	Attainment	Attainment
Lead (Pb)	Attainment	Attainment
Nitrogen dioxide (NO ₂)	Attainment	Attainment
Ozone (O ₃), 8 Hour	Marginal	Nonattainment
Particulate matter (PM ₁₀)	Attainment	Nonattainment
Particulate matter (PM _{2.5})	Nonattainment	Nonattainment
Sulfur dioxide (SO ₂)	Attainment	Attainment

/a/ California Environmental Protection Agency, Air Resources Board, 2011 State Area Designations, <http://www.arb.ca.gov/desig/adm/adm.htm>, accessed December, 2013.

SOURCE: U.S. EPA, *Green Book*, August 2014.
 PREPARED BY: RS&H, 2014.

Table 3-5
CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Level	
Carbon Monoxide (CO) /a/	8-hour	9 ppm	
	1-hour	20 ppm	
Lead	1 month average	1.2x10 ⁻⁵ µg/m ³	
Nitrogen Dioxide	1-hour	18 ppb	
	annual	30 ppb	
Ozone	8-hour	0.07 ppm	
	1-hour	.09 ppm	
Particulate Matter	PM2.5	Annual	12 µg/m ³
		24-Hours	50 µg/m ³
	PM 10	Annual	20 µg/m ³
Sulfur Dioxide	1-hour	.25 ppm	

/a/ 76 Federal Register 54294, August 31, 2011.

SOURCE: California Environmental Protection Agency Air Resources Board
 PREPARED BY: RS&H, 2013

The Hayward monitoring site is located at 3466 La Mesa Drive (ID 06-001-2001). This air monitoring site was chosen to measure ozone at a higher elevation. Located on the east side of Hayward at an elevation of 951 feet, it is the highest elevation air monitoring site in the Air District. The Hayward site was shut down on November 6, 2009 due to the demolition and reconstruction of the water tank nearby the site. The construction project was completed in late 2010 and the site reopened at the start of the ozone sampling season on April 1, 2011. Prior to the temporary shutdown of Hayward in 2010, during the three most recent years of operation of the site (2007-2009), the national 8-hour ozone standard was exceeded four times. **Table 3-6** shows the maximum and minimum values of ozone recorded at the Hayward monitoring site in 2013.

Table 3-6
2013 HAYWARD MONITORING SITE DATA: OZONE

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Maximum Value ^{/al}	-	-	-	71	86	72	62	60	72	68	52	43
Minimum Value ^{/al}	-	-	-	10	15	1	5	3	12	0	4	8

^{/al} Measured in part per billion (ppm * 1,000 = ppb). Unchecked data by BAAQMD; may contain errors.

SOURCE: BAAQMD, <http://gate1.baaqmd.gov/aqmet/AQSiteYearly.aspx>, accessed December 9, 2013.
PREPARED BY: RS&H, 2014.

Climate Change and Greenhouse Gasses

Research has shown there is a direct correlation between fuel combustion and Greenhouse Gas (GHG) emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and power generation (41 percent).⁴⁰ The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally.⁴¹ Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.⁴²

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in GHG emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating Federal agencies (e.g., NASA, NOAA, EPA, and DOE), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the International Civil Aviation Organization.⁴³

⁴⁰ GAO Report to Congressional Committees, *Aviation and Climate Change*, 2009.

⁴¹ Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in *ICAO Environmental Report*. (2010).

⁴² As explained by the U.S. Environmental Protection Agency, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." Climate Change Division, Office of Atmospheric Programs, U.S. Environmental Protection Agency, *Technical Support Document for Endangerment and Causeor Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3* (2009).

⁴³ FAA Order 1050.1E, Change 1, Guidance Memo #3. *Considering Greenhouse Gases and Climate Change under the National Environmental Policy Act (NEPA): Interim Guidance*, January 12, 2014.

3.3.2 Floodplains

Much of the below information is based on the Environmental Assessment/Environmental Impact Report (EA/EIR) prepared for the Airport Master Plan in 2002⁴⁴, as well as a hydraulic study conducted for the Airport in October 2012.⁴⁵

The Airport is located in the San Francisco Bay Watershed within the Hydrological Planning Area identified as the South Bay Basin in the San Francisco Bay RWQCB *Water Quality Control Plan* (Basin Plan). The Airport is also located in Zone 2 of the Alameda County Flood Control and Water Conservation District (ACFCD). Zone 2 includes Sulphur Creek (Line K of the ACFCD), which runs through the Airport and has a total drainage area of approximately 4.3 square miles. Sulphur Creek is an intermittent stream that originates in the Hayward Hills and passes through the highly developed commercial and residential areas east of Hesperian Boulevard before discharging into San Francisco Bay approximately 1.5 miles west of the Airport.

Within the limits of the Airport, Sulphur Creek is a combination of culverts and earthen open channels. The downstream end of the creek is a trapezoidal concrete-lined channel that changes to a double box culvert (two 8.5-feet by 4-feet) under Taxiway Z. On the north side of Taxiway Z, the culvert crosses under Taxiway Z and becomes an earthen channel until it crosses under Runway 10R and becomes four 48-inch-diameter culverts. At the upstream end of the four 48-inch culverts, the creek becomes an earthen channel and crosses under Runway 10L in a double box culvert (two 8-foot by 4.5-foot). At the upstream end, the creek becomes an earthen channel until it crosses under Taxiway A in another set of double box culverts (two 8-foot by 4-foot).

Upstream of the culvert under Taxiway A, Sulphur Creek is an earthen channel which flows through a set of four 4-foot diameter culverts before it reaches the boundaries of the airport. This reach was subject to a City habitat mitigation/enhancement project in 2008. No improvements to Sulphur Creek are proposed upstream of Taxiway A.

Under normal conditions, stormwater flows of up to 350 to 400 cfs are diverted to San Lorenzo Creek approximately 3 miles upstream of the Airport. Flows in excess of 350-400 cfs are channeled into Sulphur Creek. The Airport's Stormwater Pollution Prevention Plan (SWPPP) identifies 260 of the 543 total acres (i.e., 48%) on the Airport property as impervious surfaces. The Airport is depicted on the FEMA Flood Insurance Rate Map (FIRM) Numbers 06001C0286G and 06001C0267G (effective date August 3, 2009). As shown on **Figure 3-4**, approximately 43 acres adjacent to Sulphur Creek are within Zone AE (100-year floodplain) with smaller areas within Zone X (low to moderate risk flood zone areas, which is considered to be a non-special flood hazard area).

⁴⁴ City of Hayward. Final Environmental Assessment/Environmental Impact Report: Hayward Executive Airport Master Plan, Hayward, California. Prepared for U.S. Department of Transportation, Federal Aviation Administration. February 22, 2002.

⁴⁵ Ruggeri Jensen Azar (RJA). Hayward Airport Storm Drain Sulphur Creek (Line K) Hydraulic Summary. October 4, 2012.

Figure 3-4
FLOODPLAINS IN THE AIRPORT STUDY AREA



Legend

- Sulphur Creek
- - - Existing Sulphur Creek Culvert
- Airport Property
- 100 Year Flood Zones

3.3.3 Fish, Wildlife, and Plants

This section describes the existing fish, wildlife, and plants in the ASA and also discusses federally listed plant and animal species potentially occurring in the ASA vicinity.

3.3.3.1 Vegetation and Wildlife

Much of the Airport is developed, with natural vegetation types limited to annual grassland on the Airport infields and small patches of freshwater marsh within Sulphur Creek. Native riparian vegetation has been planted along upstream portions of Sulphur Creek as part of an earlier City of Hayward restoration project. Each vegetation or cover type is discussed in further detail below. Wildlife habitat values for each vegetation or cover type are also discussed.

Annual Grassland

Annual grassland is the predominant vegetation type on the Airport infields (i.e., rectangular or square areas between airfield runways and taxiways). Non-native grass and forb species growing in the infields include wild oat (*Avena fatua*), riggut grass (*Bromus diandrus*), rye grass (*Festuca perennis*), soft chess (*Bromus hordeaceus*), annual blue grass (*Poa annua*), bur-clover (*Medicago polymorpha*), long-beaked filaree (*Erodium botrys*), bird's-foot trefoil (*Lotus corniculatus*), and bristly ox-tongue (*Helminthotheca echioides*). Bur-clover cover approximates 50 to 75 percent cover of some of the infields.

Wildlife species observed using upland portions of the infields during a reconnaissance biological survey conducted on March 15, 2013 include great blue heron (*Ardea herodias*), killdeer (*Charadrius vociferus*), European starling (*Sturnus vulgaris*), American pipit (*Anthus rubescens*), Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*), western meadowlark (*Sturnella neglecta*), red-winged blackbird (*Agelaius phoeniceus*), tree swallow (*Tachycineta bicolor*), and Botta's pocket gopher (*Thomomys bottae*) (multiple burrows observed). Raptor species that may occasionally hunt for gophers and other small mammals over the infields include northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*; State Fully Protected Species), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), and American kestrel (*Falco sparverius*). Common amphibian and reptile species likely occurring in the grassland include Sierran treefrog (*Pseudacris sierra*), western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), and common garter snake (*Thamnophis sirtalis*). Urban-adapted mammals such as big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), northern raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*), likely forage on the infields at night.

Freshwater Marsh

Patches of freshwater marsh vegetation dominated by bulrush (*Scirpus* sp.) and cattail (*Typhus* sp.) are present in Sulphur Creek. Such patches are relatively small and are not mapped separately from adjacent wetlands or aquatic features. These cattail and/or bulrush stands provide habitat for red-eared slider turtle (*Trachemys scripta elegans*; a non-native turtle observed during March 15 reconnaissance survey) and Sierran treefrog, as well as support red-winged blackbird nesting.

3.3.3.2 Federally Listed Species

The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) identify 21 federally listed species (3 plants and 18 animals) as potentially occurring in the Airport vicinity (i.e., Hayward, San Leandro, Redwood Point, and Newark United States Geological Survey (USGS) 7.5 minute quadrangles). **Table 3-7** shows the species, status, habitat, occurrence, or potential for occurrence in the ASA for each of these species. The USFWS has jurisdiction over federally listed plant and animal species, while the NMFS has jurisdiction over all federally listed anadromous fish.

None of the federally listed species in **Table 3-7** are expected to occur on or adjacent to the Airport. Some of the pools and adjacent emergent vegetation in Sulphur Creek superficially resemble California red-legged frog (*Rana draytonii*) habitat; however, the species has not been recorded in the urbanized lowlands in the project vicinity and the Airport is isolated from known occurrences in the Hayward Hills to the east. Zander Associates conducted protocol-level red-

legged frog surveys along Sulphur Creek between Hesperian Boulevard and Skywest Drive in 1998 with negative results.⁴⁶

There are no ponds or non-urban streams with potential red-legged frog habitat within 1 mile of the Airport. California tiger salamanders (*Ambystoma californiense*) are not expected to occur on the Airport due to the lack of seasonal pools or ponds for breeding and the Airport's isolation from known occurrences in the Hayward Hills. The only California Natural Diversity Database (CNDDDB) occurrence for this species in the Airport vicinity is a California Academy of Sciences museum specimen collected in Alameda in 1886; California tiger salamanders are now considered to be extirpated from this site.⁴⁷ (CDFW 2013). Most of the other federally listed species in **Table 3-7** are considered extirpated from the San Francisco Bay region or are presumed absent due to the lack of habitat (e.g., tidal salt marsh, tidal streams, and chaparral).

3.3.3.3 State Fully Protected Species

The classification of Fully Protected was the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles, birds and mammals. Please note that most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations.

Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. White-tailed kite is the only Fully Protected species with any potential to occur on the Airport (**Table 3-7**), although its presence is likely limited to occasional foraging (i.e., no nesting habitat is present).⁴⁸

⁴⁶ Zander Associates, Hayward Airport Wetlands and Red-legged Frog Assessment – Home Depot Project. Unpublished report cited in City of Hayward. 2002. Final Environmental Assessment/Environmental Impact Report: Hayward Executive Airport Master Plan, Hayward, California. Prepared for U.S. Department of Transportation, Federal Aviation Administration. February 22, 1998.

⁴⁷ California Department of Fish and Wildlife, *California Natural Diversity Database*. Available at: <http://www.dfg.ca.gov/biogeodata/cnddb/>. Accessed January 2014.

⁴⁸ California Department of Fish and Wildlife, Fully Protected Animals, available at: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html

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Table 3-7
FULLY PROTECTED AND FEDERALLY LISTED PLANT AND ANIMAL SPECIES IN THE VICINITY OF HAYWARD EXECUTIVE AIRPORT ^{1a/}

Species	Status ^{1b/}	Habitat	Occurrence or Potential for Occurrence in Airport Study Area	Fully Protected by State (Y/N) ^{1c/}
SPECIES UNDER USFWS ADMINISTRATION:				
Plants				
Santa Cruz tarplant (<i>Holocarpha macradenia</i>)	E	Clay and sandy soils in coastal prairie, coastal scrub, and valley and foothill grassland. Elevation: 10–220 m. Blooms June to October.	Not expected to occur. Considered extirpated in San Francisco Bay Area. ^{1d/}	N
Contra Costa goldfields (<i>Lasthenia conjugens</i>)	E	Valley and foothill grassland and cismontane woodland in vernal pools, swales, and moist depressions (alkaline grasslands). Extirpated from most of its range; extremely endangered. Elevation: 0–470 m. Blooms March to June.	Not expected to occur due to lack of vernal pools and disturbed condition of airfield grasslands.	N
California seablite (<i>Suaeda californica</i>)	E	Coastal salt marshes and swamps. Elevation: 0–15 m. Blooms July to October.	Not expected to occur due to lack of coastal salt marsh.	N
Animals				
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	T	Seasonal ponds and vernal pools	Not expected to occur due to lack of vernal pools.	N
Vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	E	Vernal pools and swales in the Sacramento Valley in clear to highly turbid water	Not expected to occur due to lack of vernal pools.	N
California tiger salamander (<i>Ambystoma californiense</i>)	T	Grasslands and foothills that contain small mammal burrows (for dry-season retreats) and seasonal ponds and pools (for breeding during the rainy season).	Not expected to occur due to surrounding urbanization and consequent lack of breeding habitat.	N
California red-legged frog (<i>Rana draytonii</i>)	T	Ponds, streams, drainages and associated uplands; requires areas of deep, still, and/or slow-moving water for breeding	Not expected to occur due to lack of known occurrences in Sulphur Creek and species' presumed extirpation from the western lowland portions of Alameda County. ^{1e/}	N
Alameda whipsnake (<i>Masticophis lateralis euryxanthus</i>)	T	Chaparral and sage scrub with rock outcrops and an abundance of prey species such as western fence lizard.	Not expected to occur due to lack of chaparral. Species does not occur in lowlands adjacent to Bay.	N
San Francisco garter snake (<i>Thamnophis sirtalis tetrataeni</i>)	E	Freshwater marshes, ponds, and slow-moving streams in San Mateo County and extreme northern Santa Cruz County; prefers dense cover and water depths of at least 1 foot.	Not expected to occur. Airport outside known range of species.	Y
Western snowy plover (Pacific coast population) (<i>Charadrius alexandrinus nivosus</i>)	T	Sandy beaches, salt ponds, and salt pond levees.	Not expected to occur due to lack of habitat.	N
California clapper rail (<i>Rallus longirostris obsoletus</i>)	E	Tidal salt marshes with sloughs and substantial cordgrass (<i>Spartina</i> sp.) cover	Not expected to occur due to lack of tidal salt marsh.	Y
California least tern (<i>Sterna antillarum browni</i>)	T	Sandy beaches, alkali flats, hard-pan surfaces (salt ponds).	Not expected to occur due to lack of habitat.	Y
Salt-marsh harvest mouse (<i>Reithrodontomys raviventris</i>)	E	Tidal salt marshes of San Francisco Bay and its tributaries. Requires tall, dense pickleweed (<i>Salicornia</i> sp.) for cover.	Not expected to occur due to lack of tidal salt marsh.	Y

Species	Status ^{/b/}	Habitat	Occurrence or Potential for Occurrence in Airport Study Area	Fully Protected by State (Y/N) ^{/c/}
SPECIES UNDER NMFS ADMINISTRATION:				
Green sturgeon (southern DPS) ^{/f/} (<i>Acipenser medirostris</i>)	T	Estuaries, lower reaches of large rivers, and salt or brackish water off river mouths. Ascends far up Trinity and Klamath rivers.	Not expected to occur in Sulphur Creek due to lack of habitat and tidal connectivity to Bay.	N
Tidewater goby (<i>Eucyclogobius newberryi</i>)	E	Brackish shallow lagoons and lower stream reaches with still, but not stagnant, water	Not expected to occur. Considered extirpated in San Francisco Bay. ^{/g/}	N
Delta smelt (<i>Hypomesus transpacificus</i>)	T	Open brackish and fresh water of large channels.	Not expected to occur due to lack of aquatic habitat.	N
Central California coast coho salmon ESU ^{/h/} (<i>Oncorhynchus kisutch</i>)	E	Anadromous: spawns in coastal streams in fall and winter.	Not expected to occur in Sulphur Creek due to lack of habitat and tidal connectivity to Bay.	N
Central California Coast steelhead ESU (<i>Oncorhynchus mykiss</i>)	T Critical Habitat	Coastal streams from Russian River south to Aptos Creek (Santa Cruz Co.), including streams tributary to San Francisco and San Pablo Bays. Requires clear cool riffles with gravel or cobble substrate for spawning; and clear, cool riffles and pools for rearing habitat.	Not expected to occur in Sulphur Creek due to lack of habitat and tidal connectivity to Bay.	N
Central Valley steelhead ESU (<i>Oncorhynchus mykiss</i>)	T	Clear cool riffles with gravel or cobble substrate for spawning; clear, cool riffles and pools as rearing habitat.	Not expected to occur in Sulphur Creek due to lack of habitat. Individuals from this ESU not expected to regularly occur in South Bay.	N
Sacramento River winter-run chinook salmon ESU (<i>Oncorhynchus tshawytscha</i>)	E	Anadromous: spawns in Sacramento River system; occurs in small numbers in Central Bay.	Not expected to occur in Sulphur Creek due to lack of habitat and tidal connectivity to Bay.	N
Central Valley spring-run chinook salmon ESU (<i>Oncorhynchus tshawytscha</i>)	E	Anadromous: spawns in Sacramento River system; occurs in small numbers in Central Bay.	Not expected to occur in Sulphur Creek due to lack of habitat and tidal connectivity to Bay.	N
OTHER SPECIES White-tailed kite (<i>Elanus leucurus</i>)	–	Open grasslands, meadows, or marshes. Require dense-topped trees or shrubs for nesting and perching.	May occur. Grassland suitable for foraging but not expected to nest on Airport due to lack of trees and shrubs.	Y

/a/ California Department of Fish and Wildlife, Fully Protected Animals, available at: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html
 /b/ Status Codes: E = federally endangered / T = federally threatened
 /c/ State of California Fish and Game Code Section 3511, 4700, 5050, and Section 5515.
 /d/ California Native Plant Society (CNPS). 2013. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society, Sacramento.
 /e/ U.S. Fish and Wildlife Service (USFWS). 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, OR.
 /f/ DPS = distinct population segment
 /g/ Moyle, P.B. 2002. Inland fishes of California. University of California Press, Berkeley.
 /h/ ESU = evolutionarily significant unit

PREPARED BY: LSA Associates Inc., 2013

3.3.4 Hazardous Materials, Pollution Prevention, and Solid Waste

This section describes the presence of hazardous materials in the ASA and solid waste capacity of landfills in the Airport vicinity.

3.3.4.1 Hazard Materials

A search of available environmental records was conducted on December 4, 2013.⁴⁹ According to Federal, state, regional, and local agency databases searched by EDR, several reported release sites and permitted businesses generate, store, or dispose of hazardous materials located within the ASA. However, none of these sites is located within the Area of Potential Ground Disturbance; therefore, the Proposed Action would not result in adverse hazardous material effects.

3.3.4.2 Solid Waste

Municipal solid waste generated by the Airport is processed and disposed at the Altamont Landfill in Livermore, California, which is approximately 20 miles to the east. The Proposed Action would not increase operations at the Airport; therefore, the correlating municipal solid waste of Airport users would not permanently increase nor affect the capacity of the Altamont Landfill.

The Proposed Action would be greater than 10,000 feet from any operating or proposed landfills and would be in compliance with the landfill separation distance guidelines provided in FAA AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*. Therefore, implementation of the Proposed Action would not result in an increased bird strike potential at the Airport. Further information on these permitted sanitary landfills found in **Table 3-8**.

Table 3-8
LANDFILLS IN ALAMEDA COUNTY

Transfer Station	Owner/ Operator	Site Acreage	Design/ Permitted Capacity (TPD) ^{/a/}	Remaining Capacity (millions of tons) ^{/b/}	Expected Closure Date	Spatial Orientation
Tri-Cities ^{/c/}	Waste Management Inc.	378	2,000	<1	2010	12 mi SSE
Altamont	Waste Management of Alameda County	2,170	TPD: 7,000 TPD TPY: 1,600,000 TPY ^{/d/} Total: 87.1 million tons	43	2040	26 mi ENE
Vasco Road	Republic Services	644	2,518	11	2022	22 mi ENE

/a/ TPD: Tons Per Day

/b/ Remaining Capacity in 2008

/c/ Now Closed

/d/ TPY: Tons Per Year

SOURCE: Alameda County Integrated Waste Management Plan Countywide Element, 2003
PREPARED BY: RS&H, 2011

⁴⁹ *Hayward Executive Airport EDR Radius Map™ Report with GeoCheck, Hayward Executive Airport, December 2013.*

3.3.5 Historic, Architectural, Archaeological, and Cultural Resources

Currently, there are no listed or eligible National Register of Historic Places (NRHP) or California Register of Historic Resources sites within the area of potential ground disturbance of the Proposed Action, which is the same as the Area of Potential Effect (APE). In addition, there are no structures located within the Proposed Action APE. No archaeological resources are present within the APE and none are likely to occur because of past ground disturbing activities that occurred as part of Airport development and maintenance activities.

The APE and the area of potential ground disturbance is defined as the area in which earthmoving and ground disturbing activities are anticipated to occur under the Proposed Action. The APE includes all areas of Sulphur Creek that would be subject to culverts, grading, seeding, and ground disturbance associated with construction activities. See **Figure 3-1** for the location of the APE.

3.3.6 Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety

The Proposed Action would occur entirely on Airport property. Residential and business acquisitions or relocations would not directly or indirectly occur as a result of the Proposed Action. **Table 3-9** presents socioeconomic characteristics of the census tract containing the Airport as well as City of Hayward, Alameda County, and National averages. **Table 3-9** also presents median income for the census tract that contains the Airport. **Figure 3-5** presents the spatial extent of Census Tract 437101, which includes the Airport.

Table 3-9
DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS

	Census Tract 437101 ^{/a/}	Population of Census Tract 437101	City of Hayward	Alameda County	National Average
Under 18 years old	21%	840	25%	22%	23%
19 to 64 years old	68%	2,721	65%	66%	63%
65 and older	11%	440	10%	12%	14%
Median Age	33	N/A	33	36	36
White	21%	840	19%	34%	63%
Black	6%	240	12%	12%	13%
American Indian and Alaska Native	2%	160	1%	1%	1%
Asian	50%	2,001	22%	25%	5%
Native Hawaiian, and Pacific Islander	2%	160	3%	1%	Under 1%
Hispanic or Latino^{/b/}	22%	80	41%	22%	16%
Other/Two or More	11%	240	7%	5%	N/A
Socioeconomic Characteristics					
Median Household Income	\$100,968	N/A	\$62,313	\$71,516	\$53,046

^{/a/}: Approximately 4,002 individuals located in Census Tract 437101.

^{/b/}: “Hispanic origin” is not a race and persons of Hispanic origin may be of any race. Therefore, racial makeup often exceeds 100%.

SOURCE: United States Census Bureau American Fact Finder, 2014.

Figure 3-5
EXTENT OF CENSUS TRACT 437101



Source: United States Census; RS&H, 2014.

There are no residences, schools, child care facilities, or other similar facilities in the ASA. Therefore, health and safety risks that may disproportionately affect children would not occur as a result of the Proposed Action. However, the census tract containing the Airport does contain a disproportionate number of individuals of Asian descent. Therefore, socioeconomics, environmental justice, children’s environmental health and safety must be analyzed in **Chapter 4, Environmental Consequences and Mitigation.**

3.3.7 Water Quality

The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County (unincorporated area), the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District have joined together to form the Alameda Countywide Clean Water Program (the Alameda Permittees) and are currently subject to NPDES Permit No. CAS612008 issued by Order No. R2-2009-0074 on October 14, 2009 and amended by Order No. R2-2011-0083 on November 28, 2011.

The City of Hayward Stormwater Management and Urban Runoff Control Ordinance prohibits the discharge of non-stormwater discharges to the City's storm sewer system and establishes Stormwater Treatment Measures for development projects in accordance with the City's Site Design Standards and Guidance.

In addition to the above stormwater regulations, the Airport operates under an Industrial Storm Water Pollution Prevention Plan for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities (General Permit) to comply with the State Water Resources Control Board Water Quality Order No. 97-03-DWQ and National Pollutant Discharge Elimination System General Permit No. CAS000001. The General Permit has two major objectives: 1) to identify and evaluate sources of pollutants associated with industrial activities that may affect the quality of storm water discharges and authorized non-stormwater discharges from the Airport; and, 2) to identify and implement site-specific Best Management practices (BMPs) to reduce or prevent pollutants associated with industrial activities in stormwater discharges and authorized non-stormwater discharges. The General Permit includes long-term monitoring of SWPPP elements to ensure that they continue to be effective and maintained.

3.3.7.1 Surface Water

Rainfall runoff on the Airport is conveyed through pipelines and open drainage channels to Sulphur Creek, which serves as the primary drainage feature for the Airport. Surface water runoff is collected by storm drains along Skywest Drive and along Airport taxiways and discharged into Sulphur Creek. Seasonal drainage channels in the infields also discharge runoff into Sulphur Creek, which eventually drains into San Francisco Bay located approximately 1.5 miles west of the Airport. The contaminants in the stormwater are addressed by implementation of the General Permit BMPs.

3.3.7.2 Groundwater

The Airport is located on the East Bay Plain, which contains an aquifer system greater than 100 square miles in area.⁵⁰ The East Bay Plain aquifer is used for irrigation, industrial, and emergency groundwater supply purposes, and as a limited drinking water source. However, the shallow groundwater below the Airport is located in a non-attainment zone and is used strictly for industrial purposes. Because of its low elevation and proximity to San Francisco Bay, the Airport has a relatively shallow groundwater table, located at depths of 5 to 20 feet below ground surface. Groundwater in the Airport vicinity fluctuates with seasonal variations in precipitation, with shallower depths during the rainy season of the winter months.

⁵⁰ California Regional Water Quality Control Board, San Francisco Bay Region, Water Quality Control Plan, June 1995.

3.3.7.3 Wastewater

Wastewater generated at the Airport consists of domestic wastes from the Airport's bathrooms and restaurant, as well as treated aircraft wash water from the public-use wash rack located next to Executive Hangar A at the north end of the Airport. Wastewater is conveyed to the City of Hayward Wastewater Treatment Plant then pumped to the East Bay Dischargers Authority sewer line for eventual disposal into deeper portions of San Francisco Bay west of San Leandro.

3.3.8 Wetlands

A soil scientist investigated the Area of Potential Ground Disturbance for features potentially subject to CWA jurisdiction on March 15, 2013, using the routine determination method provided in the *Corps of Engineers Wetland Delineation Manual*⁵¹ and the revised procedures in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*.⁵² A formal jurisdictional determination (dated December 16, 2013) has been submitted to the Corps of Engineers for their review and verification.

3.3.8.1 Sulphur Creek

Approximately 3,100 linear feet of an intermittent stream, Sulphur Creek, flows westward across the Airport. Roughly half of this length is conveyed underground beneath runways and taxiways within five sets of culverts. The furthest downstream surface reach of the creek (i.e., northwest of Taxiway Z) flows within a trapezoidal concrete channel. Although this reach is located less than a mile from the San Francisco Bay, the elevation of the concrete channel has been altered by a manmade structure, which reduces the elevation of Sulphur Creek by approximately 6 feet after it leaves Airport Property. This structure was intentionally introduced into Sulphur Creek in order to restrict tidal influence within the upstream surface reaches east of Taxiway Z. The remainder of Sulphur Creek has been channelized in relatively straight, mostly trapezoidal, earthen channels until it drains into the San Francisco Bay.

Some of the creek bed and most of its lower banks are vegetated with freshwater marsh plant species, predominantly cattails and bulrushes. In the furthest upstream reach of the creek northeast of Taxiway A, a low floodplain within the trapezoidal channel banks also supports wetland plant species. This reach was subject to a City habitat mitigation/enhancement project in 2008. The creek's upper banks are vegetated with ruderal non-wetland grasses and forbs similar to those in the unpaved infields. No tidal salt marsh vegetation (e.g., pickleweed) is present within any portions of the creek channel on or adjacent to Airport property, including the reach adjacent to Skywest Golf Course.

Most of the surface reaches of Sulphur Creek have a well-defined low-flow channel with a relatively flat bed and steep cut banks. Debris wrack deposits outside this channel show that the creek does typically flow outside this channel after significant rainfall events. In some locations the low flow cut bank is interpreted as the ordinary high water mark (OHWM) elevation, while in others the OHWM elevation appears to extend outside the low flow channel onto adjacent low slope banks. At these locations, the wetland vegetation also extends beyond the low flow channel. Since the OHWM is defined as extending to the limit of the debris wrack deposits, the extent of the OHWM includes adjacent wetland vegetation.

⁵¹ Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

⁵² U.S. Army Corps of Engineers (USACE). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, MS.

3.3.8.2 Ditches and Basins

As previously mentioned, manmade shallow drainage ditches and swales drain the unpaved infield areas of the airfield into Sulphur Creek. These ditches extend mostly to the southeast of Sulphur Creek and include culverts underneath taxiways. Although several locations within these drainage swales contain some wetland plant species and evidence of seasonal ponding, most locations do not meet jurisdictional wetland criteria. None of the swales have a bed and bank or show evidence of scour, so are not delineated as other waters of the United States within Clean Water Act jurisdiction. The one exception is a short reach of ditch between Taxiway A and Runway 10L, which showed evidence of scour. Although the evidence for the ditch containing jurisdictional wetlands and other waters of the United States is marginal, it is delineated as potentially jurisdictional based on this combination of characteristics. The potential jurisdictional area of the ditch is 0.01 acre.

The remainder of the Area of Potential Ground Disturbance is vegetated with upland plant species and did not have any wetland characteristics. No other evidence of potential waters of the United States within Clean Water Act jurisdiction was observed during the March 15, 2013 field investigation.

4 CHAPTER 4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

4.1 INTRODUCTION

Alternatives that satisfied the requirements of the alternatives screening criteria in **Chapter 2, Alternatives** were retained for impact analysis in this Chapter. The following alternatives will be analyzed in this Chapter:

- No Action Alternative – No improvements to Sulphur Creek, or infield drainage would occur under this alternative.
- Proposed Action – Sulphur Creek culvert component, and infield drainage improvements.

4.1.1 Environmental Categories Not Affected by the Proposed Action

As previously discussed, the Proposed Action would not affect the following environmental resources categories, as described in FAA Order 1050.1E, Change 1:

- Coastal Resources;
- Compatible Land Use;
- Section 4(f);
- Farmlands;
- Light Emissions and Visual Impacts;
- Natural Resources and Energy Supply (note: Any build alternative would use construction material and fuel for construction equipment. However, plenty of those supplies occur in the project area. The alternatives would not adversely affect local supplies and fuel availability);
- Noise (Note: No aircraft operational increase. Minor construction-related noise and short-term runway closures. See discussion below);
- Secondary (Induced); and
- Wild and Scenic Rivers.⁵³

Since the Proposed Action would not result in adverse effects to these resources, they will not be discussed further in this chapter.

4.1.2 Environmental Categories Potentially Affected by the Proposed Action and Reasonable Alternatives.

Future aviation activity and airport operations for Hayward Executive Airport are the same under the Proposed Project and the No-Action Alternative. The only differences in environmental impacts of the Proposed Project and the No-Action Alternative are associated with impacts of the permanent removal of vegetation and unculverted creek habitat, the regrading of areas between the runways and taxiways, and the associated environmental effects of construction

⁵³ Federal Aviation Administration, Order 1050.1E, *Appendix A, Environmental Impacts: Policies and Procedures*, March 20, 2006.

activities to complete this work. Therefore, only these environmental impacts are evaluated in this EA.

Chapter 3, Affected Environment presented information on resource categories the Proposed Action would not affect. The remainder of this Chapter focuses on project-induced effects that involve the following environmental categories:

- Air Quality;
- Construction Impacts;
- Fish, Wildlife, and Plants;
- Floodplains;
- Hazardous Materials, Pollution Prevention and Solid Waste;
- Historic Architectural, Archaeological and Cultural Resources;
- Socioeconomic Impacts, Environmental Justice, and Children’s Environmental Health and Safety; and
- Water Quality;
- Wetlands; and
- Cumulative Impacts.

4.2 AIR QUALITY

This section describes the potential effects of the Proposed Action on the ambient air quality in the Airport vicinity. When compared to the No Action Alternative, implementing the Proposed Action would generate criteria pollutant emissions. However, those emissions would be temporary since they would occur only during construction activities.

4.2.1 Background and Methodology

FAA Order 5050.4B provides the basis for determining the extent of air quality impacts under the NEPA and the CAA. FAA Order 1050.1E Change 1, also provides direction on the preparation of air quality assessments. Air quality assessments prepared under NEPA must provide an analysis and summary conclusions of the Proposed Action’s and reasonable alternative’s impacts on air quality.

4.2.1.1 Regulatory Context

This section describes how air quality is regulated in the ASA and discusses the criteria and applicable statutes used to determine if the Proposed Action and reasonable alternatives would cause significant air quality effects.

The CAA requires the U.S. EPA to establish and periodically review NAAQS to protect public health and welfare.

4.2.1.2 Thresholds of Significance

NAAQS: FAA Order 1050.1E, Change 1, Appendix A2.3 provides the following air quality significance threshold:

“Potentially significant air quality impacts associated with an FAA project or action would be demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed.”

4.2.2 Environmental Consequences

This section describes the potential for air quality impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.2.2.1 No Action Alternative

Implementation of the No Action Alternative would not involve any construction activities. Thus, there would be no air quality impacts associated with the No Action Alternative.

4.2.2.2 Proposed Action

The amount of emissions of criteria air pollutants associated with construction of the Proposed Action was determined by completing an air emissions inventory (see **Appendix B**). As shown in **Table 4-1**, criteria pollutant emissions generated as a result of implementation of the Proposed Action would remain below *de minimis* thresholds for all NAAQS criteria pollutants. The Proposed Action would not result in increased operational criteria pollutant emissions and construction of the Proposed Action would not result in exceedance of applicable *de minimis* air emissions thresholds for NAAQS or CAAQS. Therefore, the Proposed Action would not result in a significant air quality impact.

Table 4-1
CONSTRUCTION EMISSION INVENTORY

NAAQS Pollutant	Emissions ^{/a/} / ^{/b/}	de minimis Threshold	Threshold Exceeded?
Volatile Organic Compounds (VOCs)	0.12	100	No
Carbon Monoxide (CO)	0.48	100	No
Oxides of Nitrogen (NO _x)	0.73	100	No
Sulfur Oxides (SO ₂)	0.29	Not applicable	Not applicable
Particulate Matter (PM 2.5 and PM 10)	0.25	100	No
Greenhouse Gasses	43.91	Not applicable	Not applicable

/a/ In tons per year

/b/ See **Appendix B** for the results and methodology of the construction emission inventory.

SOURCE: RS&H, 2014

PREPARED BY: RS&H, 2014

4.2.2.3 Assessment of Climate Change

Although there are no Federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate.⁵⁴ The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses. As noted by CEQ, 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".⁵⁵ The following provides an estimate of GHG emissions for the No Action and Proposed Action alternatives. These estimates are

⁵⁴ See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

⁵⁵ CEQ, *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, (2010). http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_02182010.pdf.

provided for information only as no Federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established.

No Action Alternative

Under the No Action Alternative there would be no increase in project-specific GHG emissions.

Proposed Action

The Proposed Action would generate GHG emissions of 43 tons over the No Action alternative during construction. This increase would comprise less than .01⁵⁶ percent of U.S. based GHG emissions and less than .001⁵⁷ percent of global GHG emissions.⁵⁸

4.2.3 Mitigation

The Proposed Action would not cause any significant air quality impacts. Nevertheless, construction contractors will use BMPs noted below to limit dust and fossil fuel emissions construction equipment generates to reduce project-related air quality effects. These BMPs include the following:

- require construction-related contractors to use ultra-low sulfur diesel in vehicles and construction equipment;
- limit the idle time of gasoline and diesel-powered construction equipment engines to no more than five minutes, when feasible;
- encourage contractors to substitute low and zero-emitting construction equipment whenever possible;
- implement a construction-employee shuttle service, rideshare program, and/or on-site food service to reduce vehicle trips;
- use electrical drops in place of temporary electrical generators, whenever possible; and
- train and monitor employees on the adherence to these emission-reducing measures.

Since the project site is located in a nonattainment for particulate matter 2.5 microns in size, the following additional BMPs aimed at reducing the occurrence of fugitive dust emissions would be implemented:

- apply non-toxic soils stabilizers to all inactive construction areas including areas with disturbed, or exposed soils, and stockpiled fill material;
- stabilize on-site truck haul routes and staging areas with dust-prevention materials;
- remove mud and dirt from haul truck wheels and cover truck bodies before leaving the construction site(s); and
- permanently cover all disturbed and exposed soils with vegetation as soon as practicable.

⁵⁶ See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

⁵⁷ CEQ, *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, (2010). http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEP_A_Guidance_FINAL_02182010.pdf.

⁵⁸ U.S. based GHG emission estimated at 6,821.8 million metric tons CO₂ equivalent in Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010, (April 2012). The IPCC estimates global GHGs in 2004 at 49 Gigatonnes.”

4.3 **CONSTRUCTION IMPACTS**

The analyses of construction impacts for this EA are based on the following assumptions:

1. Construction will occur during the California construction season, which runs from April 15 to October 15.
2. Construction activities will take place during a 5-day work week. Activities will occur from Monday thru Friday, eight hours per day.
3. Rainfall during that season will be less than 5 inches. The City of Hayward typically receives less than that level during that construction period (annual average precipitation is approximately 26 inches).
4. Construction procedures are expected to be consistent with provisions contained in FAA AC 150/5370-10E, *Specifying Construction at Airports* to ensure safe airport operations while construction activities occur.⁵⁹

4.3.1 **Background and Methodology**

Construction activities, although short-term in duration, have the potential to cause substantial environmental effects. Unavoidable, construction-related air quality emissions, noise, changes in surface traffic density and flow, water quality degradation, soil erosion, habitat loss, use of natural resources and energy, and exposure of workers to hazardous materials are examples of such effects. See **Chapter 2, Alternatives** for a summary of the project components associated with each alternative.

4.3.1.1 Regulatory Context

The regulations the EA addresses depend upon the various regulations protecting the affected environmental resources (e.g., 40 CFR Part 122 addressing National Pollutant Discharge Elimination Permit System [NPDES] requirements; Executive Order requirements on floodplains or wetlands). In addition, construction specifications associated with the Proposed Action would incorporate:

- the provisions of FAA AC 150/5370-10C;⁶⁰
- required mitigation; and
- applicable Federal, State and local regulations to reduce those effects.

4.3.1.2 Methodology

This EA uses the analytical guidelines discussed in Appendix A of FAA Order 1050.1E, Change 1 to evaluate and disclose construction impacts on particular environmental resources such as air quality or water quality.

4.3.1.3 Threshold of Significance

This EA uses the significance thresholds in FAA Order 1050.1E, Change 1, Appendix A that apply to each environmental resource construction would affect.

⁵⁹ Federal Aviation Administration, AC 150/5370-10F, *Standards for Specifying Construction at Airports*, September 30, 2011.

⁶⁰ Federal Aviation Administration. Advisory Circular 150/5370-10C, *Standards for Specifying Construction at Airports*, Item P-156 *Temporary Air and Water Pollution, Soil Erosion and Siltation Control*, current edition.

4.3.2 Environmental Consequences

This section describes the potential for construction impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.3.2.1 No-Action Alternative

Implementation of the No-Action Alternative would not involve any construction activities. Therefore, there are no construction-related impacts associated with the No-Action Alternative.

4.3.2.2 Proposed Action

Airport property includes areas that would include construction activities associated with the Proposed Action. This includes the spatial location of many construction activities such as cement mixing, parking, equipment storage, vehicle staging, and temporary infrastructure designed to accommodate construction crews.

Air Quality

The amount of airborne suspended particulates would temporarily increase in the Airport vicinity during certain construction activities. Heavy construction equipment used at the site would emit exhaust containing CO, NO_x, VOCs, and particulate matter. Temporary air quality impacts associated with these sources would vary depending on the local weather conditions, level of construction activity, and the nature of the construction operation; however, these temporary impacts would not be significant since the selected contractor would be required to implement BMPs noted below.

To minimize temporary air quality impacts, the contractor would be required to implement BMPs, such as treating excavated areas with water during dry and windy conditions, covering haul trucks, maintaining construction vehicles appropriately, using reduced speeds, suspending certain construction activities during high wind conditions, and covering graded areas with stabilizing materials. Since criteria pollutant emissions associated with construction of the Proposed Action would not exceed applicable *de minimis* thresholds, construction of the Proposed Action would not result in a significant air quality impact as described in more detail in Section 4.2..

Fish, Wildlife, and Plants

During construction activities, direct mortality to invertebrates with a reduced capacity to flee could occur. This would be a result of the earthwork associated with excavation and grading required for implementation of the Proposed Action. Since no federally or state protected fish, wildlife, or plants occur within the construction area, implementation of the Proposed Action would not affect these protected species. Overall, the construction activities associated with the Proposed Action would not result in a significant impact on Fish, Wildlife, or Plants, as described in more detail in Section 4.4.

Energy Supply, Natural Resources, and Sustainable Design

The Proposed Action would result in temporary increased energy demand throughout the construction process. Airside, landside, and surface transportation improvements associated with the Proposed Action would include the use of aggregate, sub-base materials, and concrete. In addition, trucks and construction equipment would consume fuels as needed for construction

purposes. The Proposed Action would result in a temporary increase in the quantity of common construction-related materials consumed at the Airport, which would not be significant.

Hazardous Materials and Pollution Prevention

Implementation of the Proposed Action would result in a temporary increase of on-site hazardous material storage. This is primarily due to the increased storage of diesel fuel, which is necessary for the operation of construction equipment. Implementation of the Proposed Action also would result in short-term and temporary increases in the quantity of solid waste generated at the Airport. Since the County has the ability to accommodate solid waste generated as a result of the Proposed Action and since storage of hazardous materials would be conducted in accordance with applicable Federal, State, and local laws, construction of the Proposed Action would not result in a significant hazardous material or pollution prevention impact.

Noise

Temporary noise impacts from construction vehicles and machinery would be limited to the immediate vicinity of the Proposed Action. Earthwork and site preparation would result in temporary noise generation while these activities are taking place. Noise levels would vary dependent on the nature of construction activities, the type, and model of equipment used. Given the distance to the nearest noise-sensitive land use and the presence of vegetated buffers surrounding the Airport, temporary noise impacts from construction would not be significant.

Construction of the Proposed Action would not involve activities that would permanently influence aviation-related noise. Construction equipment required for implementation of the Proposed Action would include cement mixers, backhoes, dump trucks, graders, water trucks, sweepers, and other construction equipment commonly associated with runway and culvert construction. Due to the need for runway closure, construction could occur during nighttime hours in an effort to reduce the duration of runway closure. The nearest residential land uses in relation to the project site are located approximately 1,600 feet to the north of the Proposed Action and are separated by a vegetated buffer and Skywest Golf Course. Due to the lack of noise sensitive land uses in the immediate vicinity of the Proposed Action and the presence of vegetated buffers, the Proposed Action would not result in a significant noise impact. Information regarding construction phasing and runway closure is detailed in subsequent sections.

Phase 1

Work in Phase 1 includes all associated work in the infield areas south of Taxiway A and north of Runway 10L-28R, which would require closure of Runway 10L-28R for approximately three months. Taxiway A west of Taxiway E also would be closed. Runway 10R/28L would accommodate all Airport operations during this phase of construction.

Phase 2

Work in Phase 2 includes work in the infield areas south of Runway 10L-28R and north of Runway 10R-28L, which would require closure of Runway 10R-28L for approximately three months. Taxiway A would be operational during Phase 2. During this phase of construction Runway 10R-28L would accommodate all Runway 10L-28R air traffic.

HWD operates two runways that accommodate C-II and B-I aircraft and annual services less than 90,000 propeller operations. This level of aviation activity is not anticipated to result in noise impacts to surrounding areas. As stated in FAA Order 1050.1E, Section 14.6a, “No noise analysis is needed for proposals involving Design Group I and II airplanes in approach categories A through D operating at airports whose forecasted operations in the period covered by the EA do not exceed 90,000 annual propeller operations or 700 jet operations. These numbers of general aviation (GA) propeller and jet operations result in CNEL 60 dB contours of less than 1.1 square miles that extend no more than 12,500 feet from the start of takeoff roll. The CNEL 65 dB contour areas would be 0.5 square miles or less and extend no more than 10,000 feet from start of takeoff roll.” While temporary runway closures during project construction would shift all aircraft operations onto Runway 10R-28L and then to 10L-28R, this level of aviation activity would not result in a significant noise impacts on noise-sensitive land uses.

Secondary (Induced) Impacts

Short-term construction-related employment of local contractors would occur as a result of the Proposed Action. This is considered to be a positive impact. With respect to changes in traffic volumes in the Airport vicinity during construction activities, the increase in construction-related traffic would be considered minor. Since these roads in the Airport vicinity operate at acceptable levels of service, the Proposed Action would not result in significant secondary induced impacts.

Water Quality

Without implementation of Best Management Practices (BMPs) to protect water quality, there would be a possibility that contaminants could be discharged into groundwater resources during construction activities. Construction activities would be subject to coverage under the General Permit for Discharge of Storm Water Associated with Construction Activity, Construction General Permit Order 2009-0009-DWQ.⁶¹ BMPs would be necessary to ensure water quality impacts do not extend to downstream portions of Sulphur Creek. **Section 4.9** contains BMPs that would ensure that construction of the Proposed Action would not result in significant water quality impacts. Given the guidelines of water-related BMPs, construction permit conditions, and the design of project-specific plans; the Proposed Action would not have a significant impact on water quality.

4.4 FISH, WILDLIFE, AND PLANTS

This section describes impacts of the Proposed Action and the No Action Alternative on fish, wildlife, and plant species within the ASA.

4.4.1 Background and Methodology

As noted below, a number of Federal laws, regulations, and Executive Orders protect many of the biotic communities in the ASA.

- NEPA;⁶²
- Airport and Airways Development Act, Section 47106(c)(B);⁶³

⁶¹ California Environmental Protection Agency, 2009-0009-DWQ Construction General Permit. Available at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml. Accessed January 22, 2014.

⁶² 42 U.S.C. Sections 4321–4347.

- The Endangered Species Act;⁶⁴
- Related Essential Fish Habitat Requirements of the Magnuson-Stevens Act, as amended by Sustainable Fisheries Act;⁶⁵
- Fish and Wildlife Conservation Act of 1980;⁶⁶
- EO 13112, Invasive Species;⁶⁷
- Migratory Bird Treaty Act of 1981;⁶⁸
- The Fish and Wildlife Coordination Act;⁶⁹ and
- Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federally Landscaped Grounds.⁷⁰

4.4.1.1 Regulatory Context

Numerous regulations that protect fish, wildlife, and plants are summarized below:

- 50 CFR Part 402 provide instructions on Federal agency consultation with the USFWS and preparing biological assessments to determine project-related effects on Federally-listed endangered and threatened species;
- 50 CFR 600.920 requires Federal agencies approving or funding Federal actions that may affect essential fish habitat to consult with the National Oceanic and Atmospheric Administration (NOAA) Fisheries; and
- 50 CFR Parts 10 and 10.13 discuss the taking and protection of the listed migratory birds, respectively.

The USFWS has jurisdiction over federally listed threatened and endangered plant and animal species. The federal Endangered Species Act (ESA) protects listed species from harm or “take,” broadly defined as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Any activity can be defined as a “take” even if it is unintentional or accidental. Listed plant species are typically provided less protection than listed animals.

Federal statutes require avoidance and minimization of temporary or permanent impacts to threatened or endangered species or migratory birds resulting from the project elements of the Proposed Action (Federal Endangered Species Act, Migratory Bird Treaty Act). Federal regulatory statutes require avoidance and minimization of temporary or permanent impacts to threatened or endangered species or migratory birds resulting from the project elements of the Proposed Action (Federal Endangered Species Act, Migratory Bird Treaty Act). This section identifies wildlife and plant resources and their habitats within the Airport Study Area and draws conclusions as to whether the No Action Alternative or the Proposed Action Alternative would have any type of impact to identified resources.

4.4.1.2 Thresholds of Significance

A significant impact is likely to occur when the Proposed Action would jeopardize the continued existence of fish, wildlife, and plants in question, or result in a destruction or adverse

⁶³ 49 U.S.C. Section 47106(c)(B).

⁶⁴ 16 U.S.C. Sections 1531-1544.

⁶⁵ 16 U.S.C. Section 1855(b)(2).

⁶⁶ 16 U.S.C. Section 662.

⁶⁷ Vol. 64 *Federal Register*, page 6183, Feb. 1999.

⁶⁸ 16 U.S.C. Sections 703-711.

⁶⁹ 16 U.S.C. Section 661 *et. seq.*

⁷⁰ Vol. 60 *Federal Register*, page 40837, Aug. 1995.

modification to Federally or state-designated critical habitats in the ASA. FAA Order 1050.1E, Change 1, Appendix A8.3 and FAA Order 5050.4B, note a significant impact to fish, wildlife, and plants are associated with factors affecting population dynamics and sustainability (e.g., reproductive success rates, natural mortality rates, non-natural mortality) and minimum population levels required for population maintenance.

4.4.2 Environmental Consequences

This section describes the potential for fish, wildlife, and plant impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.4.2.1 No Action Alternative

Implementation of the No Action Alternative would not involve construction activities. Therefore, the No Action Alternative would not have any adverse effect on fish, wildlife, and plants.

4.4.2.2 Proposed Action

The Proposed Action would result in the elimination of approximately 0.19 acres of wetland habitat within the AOA of the Airport and its replacement with an enclosed concrete culvert. In addition, the Proposed Action would involve grading activities which would result in the disturbance of approximately ten acres of annual grassland located on an active airfield surrounded by runways and taxiways, and other sections of Sulphur Creek that are already enclosed in culverts.

No Federal or State listed species has a high probability of occurrence within the ASA, or the Area of Potential Ground Disturbance. Since the Proposed Action would not result in adverse effects to protected species of flora or fauna the Proposed Action would not have a significant impact fish, wildlife, and plants. The impacts associated with the loss of approximately 0.19 acres of wetland habitat is addressed in **Section 4.10, Wetlands**.

4.4.2.3 Mitigation

Prior to construction activities the Airport would complete a field survey of the area to determine if ground nesting birds protected by the Migratory Bird Treaty Act are present. If nests of birds protected by the Migratory Bird Treaty Act are present, a buffer of 50 feet between construction areas and the nesting birds should be established with construction fencing and maintained until the birds have completed nesting.

4.5 FLOODPLAINS

This section discusses the unavoidable floodplain encroachment associated with the effects of the Proposed Action and the No Action Alternative. It also describes the laws and regulations applicable to those actions, how those actions would affect the natural and beneficial values of the floodplains, and measures to mitigate those effects.

4.5.1 Background and Methodology

Floodplains are areas adjacent to rivers, creeks, ditches, lakes, or other surface waters that periodically flood. The flooding normally occurs during or after large storm events or rapid snowmelt because downstream constrictions or obstructions prevent unobstructed flood flows. In other instances, storm surges, can overwhelm low laying coastal areas.

According to the Federal Emergency Management Agency (FEMA), floodplain boundaries are based on the likelihood that a specific area will flood. FEMA, often with assistance from the United States Army Corps of Engineers (USACE), determines the boundaries of floodplains based on hydraulic modeling. The results of this modeling are published as Flood Insurance Rate Maps (FIRMs). The 100-year floodplain (Zone A) is the area that statistically has a one percent chance of becoming flooded each year. A 20-year floodplain is an area that statistically has a five percent chance of becoming flooded each year.

Local and Federal agencies regulate construction in the 100-year floodplain. This is because development has an impact on the amount of flood storage the floodplain can provide and other natural and beneficial functions (e.g., aquatic and wildlife habitat, farmland). In addition, such development often puts human life and property at risk. EO 11988, *Floodplain Management*, directs Federal agencies to preserve and restore floodplain values and functions.⁷¹

4.5.1.1 Regulatory Context

DOT Order 5650.2, *Floodplain Management and Protection*, requires, FAA, as a U.S. Department of Transportation (USDOT) agency, to meet the Executive Order's requirements. Information in FEMA's *Floodplain Management Guidelines* provides information on how to meet those requirements.⁷² State and local construction regulations also address floodplain protection. The public also provides valuable information about floodplains and potential project effects.

4.5.1.2 Thresholds of Significance

The Proposed Action would represent a "significant encroachment" if it would cause one or more of the following impacts:

1. The action would have a high probability of loss of human life.
2. The action would likely have substantial, encroachment-associated costs or damage, including interrupting aircraft service or loss of a vital transportation facility (e.g., flooding of a runway or taxiway; important navigational aid out of service due to flooding, etc.).
3. The action would cause significant adverse impacts on natural and beneficial floodplain values.

4.5.1.3 Methodology

A report analyzing the existing and proposed hydraulic capacity of Sulphur Creek using Hydraulic Engineering Centers River Analysis System (HEC-RAS) software was prepared in October 2012.⁷³ Alameda County provided 15-year and 100-year flow rates for Sulphur Creek and starting Hydraulic Grade Line (HGL) at the downstream end of the analysis. A 15-year storm is the typical storm used for evaluating flood control impacts in the City of Hayward and Alameda County. A 100-year storm is the storm evaluated for FEMA. For the purposes of the analysis, the HGL values approximated the expected water surface elevations within the creek channel created by the 15-year and 100-year storm model simulations. The 15-year flow rate downstream of Line K-1 (drainage system that confluences with Sulphur Creek), approximately 400 feet upstream of Taxiway A is 682 cubic feet per second (cfs). The 100-year flow rate in this same section of Sulphur Creek is 1002 cfs.

⁷¹ Vol. 42, *Federal Register*, page, 26951, May 1977.

⁷² Vol. 43 *Federal Register*, page 6030, Feb. 1978.

⁷³ RJA 2012, op. cit.

Most of the surface reaches of Sulphur Creek have a well-defined low-flow channel with a relatively flat bed and steep cut banks. Debris wrack deposits outside this channel show that the creek does typically flow outside this channel after significant rainfall events. In some locations the low flow cut bank is interpreted as the ordinary high water mark (OHWM) elevation, while in others the OHWM elevation appears to extend outside the low flow channel onto adjacent low slope banks. At these locations, the wetland vegetation also extends beyond the low flow channel. Since the OHWM is defined as including adjacent wetland vegetation, the OHWM is mapped as extending to the limit of wrack and wetland vegetation in these reaches.

Upstream of Line K-1 to the airport boundary at Hesperian Boulevard, the 15-year flow rate in Sulphur Creek is 502 cfs. The 100-year flow rate to Hesperian Boulevard is 745 cfs. The starting HGL at the downstream end of the analysis is 20.4 feet for the 15-year storm and 24.4 feet for the 100-year storm. These flow rates and HGL values were used for the existing and proposed conditions in the HEC-RAS hydraulic model. Cross-sections for the model were developed from field surveys conducted in October 2011 and supplemented in May 2012. Record drawing research was also conducted to determine the existing culvert geometry.

4.5.2 Environmental Consequences

This section describes the potential for floodplain impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.5.2.1 No Action Alternative

Implementation of the No Action Alternative would not involve any construction activities. Therefore, there are no floodplain impacts associated with selection of the No Action Alternative.

4.5.2.2 Proposed Action

The Proposed Action would place culverts in Sulphur Creek within the 100-year floodplain and eliminates topographic inconsistencies by grading areas between the HWD runways and taxiways within the 100-year floodplain.

The HGL (or “typical water level”) at the upstream end of Sulphur Creek within the Airport boundary under the No Action Alternative during a 15-year storm event is 33.4 feet and is 34.6 feet during a 100-year storm event. With implementation of the Proposed Action, the projected HGL at the upstream end, based on the results of the HEC-RAS model simulation, is 33.5 feet during a 15-year storm event and 34.7 feet during a 100-year storm event. This analysis estimates that the water surface elevations with implementation of the Proposed Action would be 0.1-foot higher during both the 15-year and 100-year storm events. This estimated 0.1-foot difference in floodplain elevation is not significant. Both the existing Sulphur Creek vegetated channels and the culverts that connect those channels to existing Sulphur Creek underground box culverts can become overgrown with obstructing vegetation. With implementation of the Proposed Action, these areas would be placed in underground culverts that could not be obstructed by vegetation growing in the channel. The HEC-RAS modelling is not sensitive enough to predict how much the lack of vegetation in the channel might increase the channel capacity. However, in general, channels with no vegetation would have a higher capacity than channels that contain vegetation.

The 100-year floodplain map for the No Action alternative, which is the same as the 100-year floodplain map shown for existing conditions in **Figure 1-5** (based on FIRMs #06001C0267G

and #06001C0286G) and the projected 100-year floodplain map based on implementation of the Proposed Action shown in **Figure 4-1**, are essentially the same shape. Although the depth of water adjacent to Sulphur Creek within the 100-year floodplain is estimated to increase by 0.1 foot with implementation of the Proposed Action, the lateral extent of water within the 100-year floodplain in the vicinity of Sulphur Creek on HWD is essentially the same as for the No Action alternative. Therefore, the Proposed Action would not result in a “significant encroachment” upon the existing floodplains at the Airport as the Proposed Action would not:

Figure 4-1
FLOODPLAIN CONSEQUENCES



Source: ESRI, 2013; RS&H, 2013 Prepared By: RS&H, 2013

Legend

- Floodplain Impacts
- Sulphur Creek
- Existing Sulphur Creek Culvert
- 100 Year Flood Zones
- Airport Property

- result in a high probability of loss of human life because there are no residential structures or high-occupancy office buildings within the 100-year floodplain associated with the Proposed Action;
- result in the increased probability of substantial, encroachment-associated costs or damage when compared to existing conditions. A 100-year flood would result in temporary flooding of HWD and disruption of aircraft traffic, but the extent of this flooding under the Proposed Action would not be increased by more than 0.1 feet above conditions present under the No Action Alternative, which is not a significant change;
- cause significant adverse impacts on natural and beneficial floodplain values since the topographic features within the 100-year floodplain would not change except for levelling the areas between the runways and taxiways to a consistent slope, and the enclosure of

a portion of Sulphur Creek within culverts. The existing beneficial floodplain values on the Airport include water quality maintenance and groundwater recharge. The wetlands and wildlife habitat that would be removed by placing a portion of Sulphur Creek in an enclosed culvert would be replaced through mitigation as described in **Section 4.10, Wetlands**.

Therefore, the Proposed Action would not result in a significant floodplain impact.

As the floodplain areas impacted by the Proposed Action are along the edges of Sulphur Creek, and there is no practicable alternative to placing portions of Sulphur Creek in underground culverts to meet the purpose and need for the Proposed Action, there is no practicable alternative to impacting the floodplain to implement the Proposed Action.

4.6 HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

This section describes the potential for the Proposed Action to affect hazardous materials and solid waste. A review of available information was conducted to determine if properties within the ASA have known environmental concerns or contaminants. This was accomplished by field reconnaissance and review of regulatory databases, including EPA's EnviroMapper. No sampling or subsurface testing of environmental media (i.e., soils, surface or ground water) was conducted as part of this investigation. The assessment within this section does not constitute an Environmental Site Assessment or an Environmental Audit.

4.6.1 Background and Methodology

Federal, State, and local laws regulate the use, storage, transport, or disposal of hazardous materials. These laws may extend to past and future landowners of properties containing these materials. In addition, sites containing hazardous materials may create pathways to allow contaminants to affect human health and the environment.

Airport operations include the routine storage, use, and transport of hazardous materials and the generation of wastes including hazardous wastes. Hazardous materials are transported to and from the Airport by ground vehicles as well as by passenger and all-cargo aircraft. Aviation fuel represents the largest quantity of hazardous material used at the Airport. It is consumed in operations and rarely becomes a waste. Smaller quantities of other hazardous materials are stored and used on the Airport. A common waste generated is used motor oil associated with aircraft, vehicle and ground equipment maintenance at the Airport. In addition, Airport operations also generate solid waste typical of commercial and industrial activities. Any increase in aviation activity has the potential to increase the amount of hazardous materials stored, used, and transported at the Airport as well as the amount of hazardous waste and solid waste generated by Airport activities. However, the Proposed Action would not result in any increases in aviation activity.

4.6.1.1 Regulatory Context

Generally, the terms "hazardous wastes," "hazardous substances," and "hazardous materials" are associated with industrial wastes, petroleum products, dangerous goods, or other contaminants. In a regulatory context, these terms have very precise and technical meanings that are used for consistency and legal purposes. The following paragraphs discuss some of those terms.

Hazardous Wastes

Subpart C of RCRA defines this term. Hazardous wastes (sometimes called characteristic wastes) are solid wastes that are ignitable, corrosive, reactive, or toxic. Examples include waste oil, mercury, lead or battery acid. In addition, Subpart D of the Resource Conservation Recovery Act (RCRA) contains a list of specific types of solid wastes that the EPA has deemed hazardous (sometimes called listed wastes). Examples include degreasing solvents, petroleum refining waste, or pharmaceutical waste.

Hazardous Substances

Section 101(14) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) defines this term broadly. It includes hazardous wastes, hazardous air pollutants, or hazardous substances designated as such under the CWA and Toxic Substances Control Act (TSCA) and elements, compounds, mixtures, or environmental resources. It should be noted that, pursuant to CERCLA, hazardous substances do not include any petroleum or natural gas substances and materials. Examples include ammonia, bromine, chlorine, or sodium cyanide.

Hazardous Materials

According to 49 CFR Part 172, hazardous materials are any substances commercially transported that pose unreasonable risk to public health, safety, and property. These substances include hazardous wastes and hazardous substances as well as petroleum and natural gas substances and materials. Examples include household batteries, gasoline, or fertilizers.

4.6.1.2 Thresholds of Significance

Section 10 of Appendix A in FAA Order 1050.1E, Change 1 indicates that the significance threshold for determining adverse effects due to hazardous materials and hazardous wastes includes the following:

- If the Proposed Action or reasonable alternative involves a property on or eligible for the National Priority List (NPL)⁷⁴, the FAA recommends that any NEPA document disclose if presence of contamination within the boundaries of the *entire* NPL site. This helps the decision maker (and reader) determine if there are areas within the site that are not contaminated (i.e., “clean”).
- If an airport would have difficulty meeting applicable, state, or Federal laws and regulations addressing hazardous wastes or hazardous materials, then the FAA recommends that any NEPA document disclose that difficulty. This helps the decision maker (and reader) determine if extraordinary measures are needed to mitigate project-related disturbances of contaminates that would endanger the health and/or safety of citizens (e.g., connecting the project area to a new water supply or moving local residents to avoid contamination).
- If there is an unresolved issue regarding hazardous materials, then FAA recommends that any NEPA document discuss how the Proposed Action or reasonable alternative would affect a site known or suspected to be contaminated. This informs the decision maker (and reader) that the effects of

⁷⁴ The NPL is the list of areas throughout the United States and its territories that have had releases or threatened releases of hazardous substances, pollutants, or contaminants. The NPL's primary purpose is to guide the EPA in determining those sites warranting further investigation.

the contamination are not fully understood, but necessary corrective actions may be needed.

Section 10 of Appendix A in FAA Order 1050.1E, Change 1 provides guidance on determining the level of effect that would occur.

4.6.2 Environmental Consequences

This section describes the potential for hazardous material impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.6.2.1 No Action Alternative

Implementation of the No Action Alternative would not involve any construction activities. Therefore, the No Action Alternative would not result in a significant hazardous material or pollution impact.

4.6.2.2 Proposed Action

Since the Proposed Action would not increase the number of operations and enplanements, permanent additional municipal solid waste (MSW) generation would not occur. Therefore, the Proposed Action would not result in the permanent generation of additional MSW or a significant impact on solid waste disposal capacity of local landfills.

The improvements associated with the Proposed Action are not located in areas of the Airport that are known or suspected to contain environmental contamination. See **Section 4.3, Construction Impacts** for a discussion of the use and disposition of hazardous materials during construction.

Hazardous Materials

A search of available environmental records was conducted on December 4, 2013.⁷⁵ According to Federal, state, regional, and local agency databases searched, there are several reported release sites and permitted businesses for the generation, storage, or disposal of hazardous materials located within the ASA. However, none of these sites are located within the Area of Potential Ground Disturbance. Therefore, the Proposed Action would not result in hazardous material impacts to existing sites, facilities, or operations, and would not result in a significant impact associated with hazardous materials.

Solid Waste

Municipal solid waste generated by the Airport is processed and disposed at the Altamont Landfill in Livermore, California, which is approximately 20 miles to the east. The Proposed Action would not change the amount of solid waste generated at the Airport. Therefore, the Proposed Action has no potential to affect the capacity of the Altamont Landfill.

4.7 HISTORIC, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

This section describes the potential for the Proposed Action to affect historic, architectural, archaeological, and cultural resources. Due to the absence of any cultural resources in the

⁷⁵ *Hayward Executive Airport* EDR Radius Map™ Report with GeoCheck, Hayward Executive Airport, December 2013. See **Appendix D**.

Airport vicinity, the Proposed Action would not have any impact on any historic, architectural, archaeological, and cultural resources.

4.7.1 Background and Methodology

Historic properties are resources that have been determined to be significant to American history, prehistory, architecture, archaeology, engineering and culture. These resources can include districts, sites, buildings, structures, objects, landscapes, and historic or prehistoric archaeological sites; which could also be considered Native American Traditional Cultural Properties (TCPs).

4.7.1.1 Regulatory Context

The National Historic Preservation Act of (NHPA) of 1966, as amended, established the Advisory Council on Historic Preservation (ACHP) and the National Register of Historic Places (NRHP) within the National Park Service (NPS).⁷⁶ Section 106 of the NHPA requires Federal entities to consider the effect of proposed actions on properties included, and eligible for inclusion in the NRHP. Statutes and regulations applicable to historic, architectural, archaeological, and cultural resources include:

- *Archaeological and Historic Preservation Act of 1974;*⁷⁷
- *Archaeological Resources Protection Act of 1979;*⁷⁸
- *Native American Graves Protection and Repatriation Act;*⁷⁹
- *Antiquities Act of 1906*⁸⁰;
- *American Indian Religious Freedom Act of 1978;*⁸¹
- *Public Building Cooperative Use Act of 1976;*⁸²
- *EO 13006, Locating Federal Facilities on Historic properties in our National Central Cities;*⁸³
- *Historic Sites Act of 1935;*⁸⁴
- *EO 13007, Indian Sacred Sites;*⁸⁵
- *EO 13175, Consultation and Coordination with Indian Tribal Governments;*
- *Presidential memorandum of April 29, 1994, Government-to-government; Relations with Native American Tribal Governments;*⁸⁶ and
- *EO 11593, Protection and Enhancement of the Cultural Environment.*⁸⁷

4.7.1.2 Thresholds of Significance

Section 106 of the NHPA requires a Federal agency having direct or indirect jurisdiction over a proposed federal or federally-assisted undertaking, or issuing licenses or permits, must consider the effect of the proposed undertaking on historic properties.

⁷⁶ U.S. Code. 1966. National Historic Preservation Act of 1966. 16 U.S. Code 470 and following sections.

⁷⁷ U.S. Code. 1974. Archaeological and historic Preservation Act of 1974, 16 USC Subsection 469.

⁷⁸ U.S. Code. 1979. Archaeological Resources Protection Act of 1979, 16 USC Subsection 470.

⁷⁹ U.S. Code. 1990. Native American Graves Protection and Repatriation Act, 25 USC Subsection 3001.

⁸⁰ U.S. Code. 1906. American Antiquities Act of 1906, 16 UISC Subsection 431-433.

⁸¹ U.S. Code. 1978. American Indian Religious Freedom Act of 1978, 42 USC Subsection 1996.

⁸² U.S. Code. 1976. The Public Building Cooperative Use Act of 1976, 40 USC Subsection 601a.

⁸³ EO 13006, Locating Federal Facilities on historic properties in Our Nation's Cities, May 21, 1996.

⁸⁴ U.S. Code. 1935. Historic Sites Act of 1935, 16 USC Subsection 461-467

⁸⁵ EO 13007, Indian Sacred Sites, 61 FR 26771-26772, May, 1996.

⁸⁶ EO 13175, Consultation and Coordination with Indian Tribal Governments, 65 Federal Register 67249, November 2000.

⁸⁷ EO 11593 *Protection and Enhancement of the Cultural Environment.*

Pursuant to FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures*, the FAA determines whether the Proposed Action is an “undertaking” as defined in 36 CFR 800.16(y).⁸⁸ A significant impact would occur if following an adverse effect determination the FAA and the State Historic Preservation Officer (SHPO) fail to identify or implement appropriate mitigation measures. The specific criteria of effect and adverse effect, defined in 36 CFR 800.9, were used to evaluate an undertaking’s effect on a historic property.

4.7.1.3 Methodology

In order to assess the potential impacts of the Proposed Action on historic, archaeological and cultural resources, an Area of Potential Effect was established, which is identical to the Area of Potential Ground Disturbance referenced in **Figure 3-1**. The APE is a spatial area used to assess the potential direct and indirect impacts in which the Proposed Action could alter characteristics of a historic, archaeological, or cultural resource. The NRHP was consulted to identify historic and architectural structures.

4.7.2 Environmental Consequences

This section describes the potential for historic, architectural, archeological, and cultural resource impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.7.2.1 No-Action Alternative

Implementation of the No Action Alternative would not involve any construction activities. Therefore, the No-Action Alternative would not result in any impacts to historic, archaeological, or cultural resources.

4.7.2.2 Proposed Action

Currently, there are no historic properties on or eligible for listing on the National Register of Historic Places (NRHP) or the California Register of Historic Resources within the Area of Potential Ground Disturbance, which is the same as the APE. No buildings are present in the Area of Potential Ground Disturbance, so there is no potential that an undocumented building that is eligible for the NRHP could be affected by the Proposed Action.

The FAA has previously consulted with the California State Historic Preservation Officer (SHPO) regarding whether any archaeological resource on or eligible for the NRHP are present at HWD. In 2001, during preparation of the Environmental Assessment for the HWD Master Plan, the SHPO concurred with the FAA in a June 18, 2001 letter that there are no known significant archaeological resources on or eligible for the NRHP within the boundaries of HWD (see **Appendix E**). The FAA reviewed the prior determination by the FAA and the SHPO in 2001 that no known significant archaeological resources on or eligible for the NRHP were within the boundaries of HWD, and concluded no additional consultations under NHPA, Section 106, were necessary, as no historic properties were present. The FAA confirmed its determination with the SHPO on October 29, 2015.⁸⁹ As a result of extensive grading and earthmoving activities that have occurred at the Airport in the past, it is very unlikely that undiscovered archaeological resources eligible for the NRHP exist at HWD.

⁸⁸ FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures*, March, 2006.

⁸⁹ Personal communication between SHPO Historian Tristan Tozer and FAA Western-Pacific Region Environmental Protection Specialist David Kessler on October 29, 2015.

As there are no historic properties on or eligible for the NRHP within the APE, the Proposed Action would have no effect on historic properties. However, in the event that unanticipated archaeological or cultural resources are discovered during construction, all ground disturbing activities in the vicinity of the find will be halted. The SHPO and FAA would immediately be notified to ensure compliance with 36 CFR § 800.13 *Post Review Discoveries*.

4.8 SOCIOECONOMIC IMPACTS; ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY

4.8.1 Background and Methodology

Socioeconomic data was gathered in the ASA in order to determine the potential for the proposed Action to result in socioeconomic impacts, environmental justice impacts, and the locations where the environmental health and safety of children could be affected. Information presented in **Chapter 3, *Affected Environment*** presents the baseline demographic, and income conditions.

4.8.1.1 Regulatory Context

Statutes, regulations, and policies that apply to the evaluation of socioeconomic impacts, environmental justice, and children's environmental health and safety risk are as follows:

- Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*⁹⁰;
- Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risk*⁹¹; and
- *Uniform Relocation Assistance and Real Property Acquisition Policies Act*, as amended,
- *Implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act*
- *Act (URARPAPA) of 1970*⁹².

4.8.1.2 Thresholds of Significance

Potential socioeconomic impacts would be considered significant if the Proposed Action would result in:

- extensive relocation, but sufficient replacement housing is unavailable;
- extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- disruption of local traffic patterns that substantially reduce the Levels of Service of the roads serving the airports and its surrounding communities; or
- a substantial loss in the community tax base.

⁹⁰ Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 59 FR 7629, February 16, 1994.

⁹¹ Executive Order 13045, *Protection of Children from Environmental Health Risk and Safety Risks*, 1997.

⁹² *Uniform Relocation Assistance and Real Property Acquisition Policies Act*, as amended, 1970.

For environmental justice impacts, the Proposed Action would have to result in a disproportionately high and adverse human health or environmental effects on minority or low-income populations.

For children's health and safety risks, the Proposed Action would have to result in a disproportionate health and safety risks to children.

4.8.1.3 Methodology

Socioeconomic impacts were determined through the evaluation of the areas affected by each alternative. Potentially affected land uses, residences, buildings, and transportation facilities were identified using information from Geographic Information System (GIS) databases and United States Census databases. The evaluation of environmental justice impacts was based on the potential to result in significant noise, air quality, water quality and other physical direct and indirect impacts that would affect a minority or low income population. The evaluation of children's environmental health and safety risk was based on the potential to result in direct impacts to children in a residential or business setting within the ASA.

4.8.2 Environmental Consequences

4.8.2.1 No Action Alternative

Implementation of the No Action Alternative would not involve any construction activities. Therefore, the No Action Alternative would not affect socioeconomics, not produce any environmental effects on minority or low-income populations, and would not affect the environmental health and safety of children.

4.8.2.2 Proposed Action

The Proposed Action would not require the acquisition of land, relocation of any individuals, or result in the disruption of any established community or existing local traffic patterns. Construction activities associated with the Proposed Action would occur entirely on Airport property and would not temporarily or permanently disrupt essential community services. Implementation of the Proposed Action would not result in a significant increase in air pollutant emissions or in a significant release of environmental contaminants. The Proposed Action would not result in a significant impact to any environmental resource.

Children's Environmental Health and Safety Risk

As the Proposed Action has no potential to relocate children to locations closer to environmental contaminants, to produce a significant increase in air pollutant emissions, or result in a release of environmental contaminants into the environment, the Proposed Action would not increase environmental health and safety risks to children.

Environmental Justice Considerations

The Proposed Action has no potential to relocate minority or low-income populations closer to environmental contaminants, and would not produce a significant increase in air pollutant emissions, or result in a release of environmental contaminants into the environment. Therefore, the Proposed Action would not result in a disproportionately high or adverse environmental impact on minority or low-income populations.

4.9 WATER QUALITY

This section describes the potential for the Proposed Action and the No Action Alternative to affect water quality in the ASA. It also describes the laws and regulations applicable to the No Action Alternative and the Proposed Action, how those actions would affect water quality and measures to mitigate those effects.

4.9.1 Background and Methodology

In accordance with FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, the following is a list of impacts to water quality that would likely be considered significant if they are persistent and if proper mitigation is not available:

- water quality parameters to exceed state standards in receiving waters;
- permit limits are exceeded;
- noncompliance with best practices and mitigation is not possible; and
- an increase in toxic substances in water supply wells in the affected area.

The EPA and the RWQCB regulate water quality in the ASA. The regulations that guide the management of water quality include:

- *Federal Water Pollution Control Act*, as amended, known as the *Clean Water Act*,⁹³
 - as amended by the *Clean Water Floodplains and Floodways Act of 1977*,⁹⁴
 - as amended by the *Oil Pollution Act of 1990*,⁹⁵ and
- *Safe Drinking Water Act*, as amended, also known as the *Public Health Service Act*.⁹⁶

4.9.1.1 Regulatory Context

Stormwater Regulations

The U.S. EPA was granted authority under the Clean Water Act of 1977 to establish regulations to restore and maintain the quality of surface waters. The EPA implemented the NPDES permit program to regulate point sources of discharge pollutants into surface waters. In California, authority to regulate under the NPDES program has been delegated to the California State Water Resources Control Board (SWRCB). There are nine regional boards that implement SWRCB policy as related to climate and geographic conditions within the boards' regulatory boundaries. The project is located within the San Francisco Regional Water Quality Control Board boundary (SFRWQCB).

Porter-Cologne Water Quality Control Act

The State of California adopted the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) in 1969 to establish the nine regional boards, adopt statewide water quality control plans to establish water quality objectives for specific water bodies and authorize the NPDES program under the CWA. The RWQCB prepared the San Francisco Bay Basin Water Quality Control Plan (Basin Plan) to establish the legal, technical, and programmatic basis for water quality regulation in the region. The Basin Plan describes beneficial uses of major surface waters and their tributaries that are enforced by the RWQCB through issuance of permits. Specifically, under its Porter-Cologne Act authority, the RWQCB reviews projects for either Waiver of Waste

⁹³ U.S. Code. 1972. *Clean Water Act*, 32 USC Subsection 1251-1387.

⁹⁴ U.S. Code. 1997. *Floodways Act of 1977*, 33 USC Subsection 1252.

⁹⁵ U.S. Code. 1990. *Oil Pollution Act of 1990*, 33 USC Subsection 1252.

⁹⁶ U.S. Code. 1942. *Public Health Service Act*, 42 USC Subsection 300f to 300j-26.

Discharge Requirements, or for more complicated or larger scale projects, Waste Discharge Requirements. Waste Discharge Requirements are required of all wastewater treatment providers in the region. The RWQCB also reviews permits for discharge of wastes and wastewater to land and land disturbance activities if the activities could affect the beneficial uses of surface water or groundwater. The Basin Plan identifies beneficial uses for each hydrologic unit and subunit within the RWQCB's jurisdictional area. Project applications are reviewed, in part, for compliance with beneficial uses in the unit. Beneficial uses for Sulphur Creek include Warm Freshwater Habitat, Wildlife Habitat, Water Contact Recreation, and Noncontact Water Recreation.

4.9.1.2 Thresholds of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 17.3 states a significant water quality effect would occur if the EA and early consultation:

- show that there is a potential to exceed water quality standards;
- identify water quality effects that cannot be avoided or satisfactorily mitigated; or
- indicate difficulties in obtaining required permits.

4.9.1.3 Methodology

Water quality regulations and consultation with agencies responsible for issuing water-related permits will normally identify issues associated with project-related water quality.

4.9.2 Environmental Consequences

This section describes the potential for water quality impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.9.2.1 No Action Alternative

Implementation of the No Action Alternative would not involve any construction activities. Therefore, no impacts to water quality would occur under the No Action Alternative.

4.9.2.2 Proposed Action

The Proposed Action involves the placement of culverts (8-foot by 4-foot culverts) and fill material into Sulphur Creek. The first section (from Taxiway A to Taxiway Z, respectively) would involve the placement of a 170-foot-long box culvert and the subsequent filling and grading of a 3,920-square-foot segment of the creek. The second segment would involve the placement of a 180-foot-long box culvert into Sulphur Creek. This component would also involve subsequent filling and grading of 2,745-square-feet of creek channel. Finally, an 90-foot-long section of box culvert would be placed into the third and final segment of Sulphur Creek. This 1,655-square-foot area would also be filled and graded. This action would result in the replacement of the existing natural creek bottom with impervious concrete bottom. The net increase in impervious surface area caused by the above activities would result in a 0.67-acre-foot stormwater runoff increase over the duration of the entire year and would reduce natural infiltration in this portion of Sulphur Creek.

During construction, grading and other ground disturbing activity on the infield areas of the airfield have the potential to increase sediment loads and turbidity in stormwater runoff. In the long term, the proposed channelization of the creek would decrease sediment loads into

Sulphur Creek due to the replacement of the earthen banks between the infields with a concrete-lined channel. The Proposed Action would be subject to existing water quality permit conditions set forth in NPDES Permit number CAS612008 and would not require groundwater withdrawals at the Airport.

Since the Proposed Action would not to exceed water quality standards implementation of the Proposed Action would not result in a significant water quality impact. Furthermore, implementation of the mitigation measures and Best Management Practices (BMPs) described below would further protect water quality. With implementation of the mitigation measures and BMPs described below, implementation of the Proposed Action would not result in a significant water quality impact.

4.9.3 Mitigation and Best Management Practices

Since the Proposed Action would involve grading and soil disturbance over 1 acre, the Airport will be required to file a Notice of Intent (NOI) with the SFRWQCB to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit). The Construction General Permit requires the development and implementation of a SWPPP that includes construction and post-construction BMPs including, but not limited to the following:

- install fiber rolls or silt fencing adjacent to aquatic features for erosion control. Fiber rolls should be buried 3-4 inches into the soil, staked every 4 feet, and limited to use on 3:1 slopes. Silt fencing should be trenched 6 inches by 6 inches into the soil, staked every 6 feet, and placed 2-5 feet from the toe of any slope;
- designate a concrete washout area to avoid wash water from concrete tools or trucks from entering gutters, inlets, or storm drains. Maintain washout area and dispose concrete waste on a regular basis; and
- protect drain inlets from polluted storm water through the use of filters such as fabrics, gravel bags, or straw wattles.

4.10 WETLANDS

This section describes the existing jurisdictional and non-jurisdictional wetlands in the ASA. The section also describes the laws, regulations, and policies applicable to the Proposed Action and the No Action Alternative.

4.10.1 Background, Methodology, and Regulatory Context

The United States Army Corps of Engineers (USACE) Wetland Delineation manual defines wetlands as:

“...those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”⁹⁷

⁹⁷ Environmental Laboratory, *Corps of Engineers Delineation Manual*, Technical Report 87-1, 1987.

Wetlands are productive parts of the landscape. They are important to watershed and biotic health. Wetlands absorb floodwaters, supply base flow, protect shorelines, trap sediments, recharge groundwater, and provide habitat for fish and wildlife.

The USACE regulates dredge and fill activities in wetlands within Clean Water Act (CWA) jurisdiction under Section 404 of the CWA. All wetlands adjacent to Sulphur Creek are within CWA jurisdiction.

Several laws and Executive Orders address and regulate Federal airport activities and their effects on wetlands. The following paragraphs list and summarize the requirements of the laws most applicable to airport projects.

- The Federal Water Pollution Control Act, as amended by the CWA;⁹⁸
- The Fish and Wildlife Coordination Act of 1980 (FWCA); and⁹⁹
- EO 11990, *Protection of Wetlands*.¹⁰⁰
- Rivers and Harbors Act of 1899;¹⁰¹ and
- Clean Water Act.¹⁰²

CWA: The law's purpose is to maintain and restore the biotic, chemical, and physical characteristics of the Nation's waters. As a result, Congress required Federal agencies to develop procedures to prevent, reduce, and remove water pollution from waters of the United States (including wetlands). Section 404 of the CWA established a permitting program for the disposition of dredged or fill material into waters of the United States. Airport projects often unavoidably affect wetlands on airport property because FAA design standards require placing certain aviation facilities (i.e., runways, taxiways, aprons, navigational aids) at specific locations on airports to promote safe, efficient air transportation. The USACE regulates discharges to waters of the United States under its authority to administer Section 404 of the CWA. A permit under Section 404 is required to dredge jurisdictional wetlands or to place fill in them. All Section 404 permits require water quality certification under Section 401 of the Clean Water Act. In the San Francisco Bay Area, this regulatory program is administered by the SFRWQCB. Project proponents that propose to fill wetlands or other waters of the United States must apply for water quality certification from the RWQCB. The RWQCB has adopted a policy requiring mitigation for any loss of wetland, streambed, or other jurisdictional area.

FWCA: The Act requires a Federal agency to coordinate with the USFWS when a project under an agency's purview would control (i.e., impound, divert, drain) a stream or other water body.

EO 11990: This Order requires Federal agencies to protect, preserve and enhance the Nation's jurisdictional and non-jurisdictional wetlands to the fullest extent practicable. As a result, Federal actions avoid or minimize the destruction, loss, or degradation of those wetlands if possible. Agencies do so by evaluating practical alternatives that avoid wetlands. If avoidance is not possible, agencies must ensure project designs and mitigation minimize the unavoidable effects.

⁹⁸ 33 U.S.C. Chapter 26.

⁹⁹ 16 U.S.C. Section 661.

¹⁰⁰ Vol. 42, *Federal Register*, page 26961, May 1977.

¹⁰¹ 33 U.S.C. 403; Chapter 425, March 3, 1899; 30 Stat. 1151

¹⁰² 33 U.S.C. § 1251 *et seq.*

Certain structures and/or work in or affecting navigable waters of the United States are regulated under the authority of the USACE pursuant to Section 10 of the Rivers and Harbors Act.¹⁰³ Under this Act, the creation of any obstruction to the navigable capacity of any waters of the United States is prohibited without the specific approval of the USACE. In addition, excavation, fill, or any modification in any way of the course, location, conditions, or capacity of the navigable waterway or associated waterways is also subject to the regulatory authorization of this Act.

4.10.1.1 Thresholds of Significance

FAA Order 1050.1E, Appendix A, Section 18.3 indicates that a significant impact would occur to wetlands when a proposed action would do any of the following:

- 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 wetland's values and functions or those of a wetland to which it is connected.
- Substantially reduce the affected wetland's 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 of secondary activities or services that causes any of the above impacts.
- Be inconsistent with applicable state wetland strategies.¹⁰⁴

4.10.1.2 Methodology

The wetland delineation presented in **Appendix C** served as the basis for the assessment and analysis of the potential impacts associated with implementation of the Proposed Action, which includes those areas that would be directly affected by construction activities. In April of 2013, the USACE was sent a letter requesting verification of the extent of Clean Water Act jurisdiction in the areas affected by the Proposed Action. No response was ever received from the USACE and a USACE file number was not assigned.

4.10.2 Environmental Consequences

This section describes the potential for wetland impacts associated with implementation of the Proposed Action and the No Action Alternative.

4.10.2.1 No Action Alternative

Implementation of the No Action Alternative would not involve any construction activities. Therefore, the No Action Alternative would not result in any impacts to wetlands.

4.10.2.2 Proposed Action

The Proposed Action would result in the fill (installation of culverts) on three sections of Sulphur Creek totaling 0.19 acres, or 440 linear feet of creek channel, including adjacent wetlands, between Taxiway A and Runway 10L-28R. The conversion of approximately 0.19 acres of

¹⁰³ 33 U.S.C. 403

¹⁰⁴ FAA Order 1050.1E, *Environmental Impacts, Policies and Procedures*.

wetlands and creek channel is a potentially significant impact that would be reduced to a not-significant level because mitigation is proposed to mitigate for the impact of the placing the wetlands and creek channel in a culvert. Since the impact of the Proposed Action would be offset by mitigation, implementation of the Proposed Action would not result in a significant wetland impact.

As the wetlands impacted by the Proposed Action are along the edges of Sulphur Creek, and there is no practicable alternative to placing portions of Sulphur Creek in underground culverts to meet the purpose and need for the Proposed Action, there is no practicable alternative to impacting wetlands to implement the Proposed Action.

4.10.3 Mitigation and Minimization

This section describes mitigation and minimization measures that could be used to reduce the adverse wetland effects associated with implementing the Proposed Action.

4.10.3.1 Mitigation

HWD would submit a Clean Water Act, Section 404 permit application for the Proposed Action as part of the engineering design process. As the Proposed Action involves filling less than .5 acre of jurisdictional waters, the project could be authorized by the U.S. Army Corps of Engineers under Nationwide Permit 39 for Commercial and Institutional Developments or as an Individual Permit. To compensate for the loss of 0.19 acres (440 linear feet) of jurisdictional waters, the Airport would restore or purchase stream channel and/or wetland habitat credit from an established mitigation bank, or identify an alternative mitigation measure to compensate for the losses of stream channel and wetland habitat at a minimum 1:1 ratio. Although specific mitigation measures have not yet been identified, the final mitigation strategy may involve the following components:

- In previous informal discussions with the Airport, the RWQCB has indicated their preference for mitigation for impacts to Sulphur Creek in the form of daylighting upstream creek channels currently in underground culverts. Alternatively, the Airport could purchase mitigation credits, after an appropriate mitigation ratio was determined to offset wetland impacts. These credits would be purchased from an agency-approved wetland mitigation bank within the lowlands surrounding San Francisco Bay. For example, the Airport is within the agency-approved service area for the San Francisco Bay Wetland Mitigation Bank in Redwood Shores.

The final wetland mitigation program would be subject to the review and approval by the regulatory agencies.

4.10.3.2 Minimization

Construction could potentially result in erosion and sedimentation runoff. Contractors should implement BMPs and minimization measures to reduce the impact of construction activities on wetlands. Examples of some of these BMPs and minimization measures include:

- Stabilize construction entrances and exits to prevent tracking onto roadways.
- Protect exposed slopes from erosion through preventative measures and cover the slopes to avoid contact with storm water by hydroseeding.
- Apply mulch or using plastic sheeting on exposed areas.
- Capture and treat stormwater runoff within an existing sedimentation and filtration basin.

- Install straw wattles and silt fences on contours to prevent concentrated flow, straw wattles should be buried three to four inches into the soil, staked every four feet and limited to use on slopes that are no steeper than three units horizontal to one unit vertical - silt fences should be trenched six inches by six inches into the soil, staked every six feet, and placed two to five feet from any toe of slope.
- Designate a concrete washout area to avoid wash water from concrete tools or trucks from entering gutters, inlets or storm drains, and maintain washout area and dispose concrete waste on a regular basis.
- Establish a vehicle storage, maintenance and refueling area to minimize the spread of oil, gas and engine fluids.
- Use oil pans under stationary vehicles, if necessary.
- Protect drainage inlets from receiving polluted storm water through the use of filters such as fabrics, gravel bags or straw wattles.
- Check the weather forecast and be prepared for rain by having necessary materials onsite before the rainy season.
- Inspect all BMPs before and after a storm event and maintain BMPs on a regular basis and replace as necessary.

4.11 CUMULATIVE IMPACTS

This section discusses how the selected alternative would contribute to cumulative impacts on environmental resources in the ASA and measures to mitigate those effects.

4.11.1 Background

The selected alternative would occur in an area where other development has occurred, and where it could occur in the reasonably foreseeable future. As a result, this EA must evaluate and disclose the degree to which the selected alternative would contribute to the cumulative effects on the environmental resources those actions have or will affect.

4.11.1.1 Regulatory Context

According to CEQ 40 CFR 1508.7 defines a cumulative impact as:

“...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”¹⁰⁵

CEQ regulations implementing NEPA require the analysis and disclosure of the selected alternative’s potential cumulative effects (40 CFR 1508.25.(a)(2) and (3)). CEQ and NEPA do so to tell the public if the selected alternative, when considered with other projects occurring within the ASA during specific time frames (i.e., “past, present, and reasonably foreseeable actions”) would cause a significant environmental effect.¹⁰⁶

¹⁰⁵ Council on Environmental Quality. 40 U.S.C., Section 1508.7.

¹⁰⁶ FAA Order 5050.4B, paragraph 9.q. defines “reasonably foreseeable actions.”

4.11.1.2 Thresholds of Significance

The significance thresholds used in the cumulative analysis vary with the resources affected. However, FAA does not have significance thresholds for cumulative impacts. As a result, this EA's cumulative analysis uses the thresholds of significance in FAA Order 1050.1E, Change 1, Appendix A that FAA has developed for each individual impact category.

4.11.2 Past Projects in Sulphur Creek

Since the 2002 HWD Master Plan was completed, substantial airfield changes have been implemented at Hayward. These changes are summarized below:

- Runway 28L was extended 670 feet and Taxiway A1 was widened adjacent to the runway threshold.
- North side helicopter pads (six) were constructed.
- Ascend Development completed ParkAvion, a hangar complex adjacent to the airport administration building.
- Approximately 16 acres of airport property were sold from the airport.
- The City of Hayward Sulphur Creek mitigation/enhancement project was completed.
- The East Bay Municipal Utility District and San Francisco Public Utility Commission Water System Intertie project and associated Skywest Pump Station were constructed.

4.11.3 Future Projects

On the Airport's future conditionally approved ALP the Airport has several projects listed. In addition, there are several planned and ongoing projects in the Airport vicinity. These projects include:

- Taxiway Z and Taxiway D intersection.
- Construct hangars west of Taxiway Z.
- Construct Air Traffic Control Tower West of Taxiway Z.

4.11.4 Proposed Action

The past, present, and reasonably foreseeable projects have increased the quantities of impervious surfaces at the Airport, increased the potential for operational activity, and reduced the size of the Airport. No other project would or has directly affected wetlands beyond a threshold of significance. Surface runoff increases have not caused Sulphur Creek to exceed the mandated 15-year storm design capacity and the Sulphur Creek Culvert Project would improve drainage efficiency of the airfield.

When past, present, and reasonably foreseeable projects are cumulatively examined with the goals, potential adverse environmental effects, and functions of the Proposed Action, these individual projects would not cumulatively contribute to a significant adverse environmental effect in environmental categories contained with FAA Order 1050.1E.¹⁰⁷ Therefore, the Proposed Action would not result in a significant cumulative impact.

¹⁰⁷ FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, 2006.

4.11.4.1 Air Quality

Each project at the Airport has contributed to temporary construction-related emissions at the Airport. Projects involving construction have occurred at the Airport during subsequent construction years. Therefore, the temporary construction emissions anticipated from the Proposed Action would not contribute to a significant level of temporary construction-related emissions in a year. Since the Proposed Action would not result in a permanent increase in annual emissions, it would not cumulatively contribute to significant air quality impacts.

4.11.4.2 Construction Impacts

Past projects have resulted in temporary construction impacts in subsequent years. Since no past project has resulted in permanent construction impacts or significant impacts that could not be mitigated, the cumulative contribution of temporary impacts associated with the Proposed Action would not result in a significant cumulative construction impact.

4.11.4.3 Fish, Wildlife, and Plants

The only project that has directly affected fish, wildlife, and plants considered for this cumulative analysis is the Sulphur Creek Enhancement Project. The Sulphur Creek Enhancement Project had a positive impact on fish, wildlife, and plant habitat at the Airport by improving the quality of habitat within Sulphur creek. Therefore, the cumulative effect of the Sulphur Creek Culvert Project along with the Sulphur Creek Enhancement Project would not result in a significant cumulative fish, wildlife, and plant impact.

4.11.4.4 Floodplains

Past construction projects have resulted in the addition of impervious surfaces, which have increased the quantities of annual stormwater runoff at the Airport. A summary of each project's contribution to floodplain impacts at the airport are provided below:

Runway 28L Extension and Taxiway A1 Widening

The Runway 28L extension and Taxiway A1 widening Project did not involve floodplain encroachment. This project did include additional impervious surfaces which results in a net increase in stormwater runoff. Drainage improvements associated with this project accommodated the additional runoff.

North Side Helicopter Pads

The North Side Helicopter Pad Project did not involve the introduction of additional impervious surfaces because the area was previously paved as part of a past apron project. This project permitted helicopters to operate in areas of the airfield subject to flooding during 100-year flood events. The North Side Helicopter Pad Project did not involve the construction of structures that would be regularly inhabited by people. This project also did not involve the storage of property that would be subject to the risks associated with flooding. Therefore, this project did not cumulatively contribute to 100-year floodplain impacts.

ParkAvion, Hangar Complex

ParkAvion is a 40,000 square-foot hangar complex that features fifteen private bays that accommodate large and small aircraft. This project was constructed on land previously occupied by impervious surfaces outside of the 100-year floodplain. Since this action did not result in additional impervious surfaces and was not located in the 100-year floodplain, it would not cumulatively contribute to floodplain impacts that would occur under the Proposed Action.

Proposed Action

The Proposed Action would result in a minor increase in impervious surfaces, but the estimated elevation of the 15-year storm event and 100-year storm event (floodplain), is not significantly higher than under the No Action Alternative. The Proposed Action would not contribute to a significant cumulative floodplain impact at the Airport.

4.11.4.5 Hazardous Materials, Pollution Prevention and Solid Waste

Implementation of the Proposed Action would not result in a permanent increase in the storage or consumption of hazardous materials at the Airport. The Proposed Action would not affect any areas that contain hazardous material contamination. Therefore, the Proposed Action would not cumulatively contribute to a significant hazardous material impact.

4.11.4.6 Historic, Architectural, Archaeological, and Cultural resources

The Proposed Action would have no adverse effect on historic, architectural, archaeological, or cultural resources. Past projects have not resulted in adverse effects to historic, architectural, archaeological, and cultural resources at the Airport. However, in the event previously undiscovered resources are discovered during project implementation, mitigation measures are identified in the document to protect and preserve these resources.

4.11.4.7 Water Quality

The introduction of new impervious surfaces can adversely affect water quality by creating a new area for pollutants to be deposited and by eliminating flora capable of filtering pollutants from runoff. Past projects have resulted in increased impervious surfaces at the Airport. Since the Proposed Action would also involve the introduction of new impervious surfaces at the Airport, it would incrementally contribute to adverse water quality impacts at the Airport. However, the Proposed Action would not cumulatively contribute to a permitted pollutant exceedance. Therefore, the Proposed Action would not result in a significant cumulative impact at the Airport.

4.11.4.8 Wetlands

Past actions at the Airport included in this cumulative impact analysis have not resulted in the conversion of wetlands at the Airport. Since the Proposed Action, including associated mitigation, would not result in a significant wetland impact, implementation of the Proposed Action alone could not result in a significant cumulative wetland impact.

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5 CHAPTER 5 CONSULTATION AND COORDINATION

5.1 INTRODUCTION

Public involvement and agency coordination programs were implemented at the beginning of the preparation of this EA to ensure that information was provided to the general public and regulatory agencies, and that input from these parties was received and considered as the draft EA was prepared. Under 40 CFR 1501.4, federal agencies are required to involve environmental agencies, applicants, and the public, to the extent practicable, in preparing EAs. Therefore, when conducting the NEPA process, the FAA and the Airport Sponsor are encouraged to begin early coordination with the proper federal, state, tribal, and local agencies, including surrounding municipalities, to determine any possible environmental concerns. The primary components of the agency coordination and public involvement program for the EA included:

- distribution of an early notification letter to agencies, local communities, and stakeholder groups;
- publication of the Draft EA for agency and public review; and
- publication of a Final EA that included responses to comments received on the Draft EA.

Keeping agencies and the public informed and gathering their input is an essential component of any environmental study. The following sections summarize the agency coordination and public involvement program for this EA.

5.2 SCOPING / EARLY NOTIFICATION

In April of 2013, an early scoping / notification letter was mailed to regulatory agencies, local communities, stakeholders, and interested members of the public. The notice summarized the project purpose and elements, along with the NEPA document preparation and process. A copy of the early scoping / notification letter is included in **Appendix A**. The list of parties to whom the early scoping / notification letter was distributed also is included in **Appendix A**.

5.3 CONSULTATION WITH TRIBAL COMMUNITIES

The FAA contacted the California Native American Heritage Commission (NAHC) to receive information as to whether the NAHC's files indicated Native American cultural resources might occur in the area of the Proposed Action. The NAHC stated their sacred lands file did not indicate the presence of cultural resources in the immediate project area. The NAHC provided a list of nine Native American individuals and organizations who may have knowledge of cultural resources in the project area. None of these individuals or organizations represented federally recognized Indian tribes.

By letter of October 20, 2014, the FAA contacted each of the nine individuals and organizations seeking their comments regarding concerns that uniquely or significantly affect their organization or Tribe related to the proposed airport improvements and whether cultural

resources might occur in the project area. As of the publication of this Final EA, none of these individuals or organizations has responded.

5.4 EA AVAILABILITY FOR REVIEW

The Draft EA was available for review by the general public, government agencies, and interested parties for a 30-day review period held from January 16, 2015 to February 17, 2015. The Notice of Availability of the Draft EA was published in the *Hayward Daily Review* concurrent with the beginning of the review period. Copies of the Draft EA were available for review at the locations listed in **Table 5-1**. All comments on the Draft EA were considered by the Airport and the FAA in preparing the Final EA. Comments received during the 30-day comment period on the Draft EA and responses to those comments can be found in **Appendix F, Addenda and Responses to Comments**.

Table 5-1
PUBLIC REVIEW DISTRIBUTION LIST

FAA Western-Pacific Region, Airports Division	15000 Aviation Boulevard	Hawthorne
FAA Western-Pacific Region, San Francisco Airports District Office	1000 Marina Boulevard, Suite 220	Brisbane
Hayward Public Library	835 C Street	Hayward
Hayward Executive Airport	20301 Skywest Drive	Hayward

5.5 FINAL EA AVAILABILITY FOR REVIEW

A Final EA and a Proposed Finding of No Significant Impact (FONSI) and Record of Decision (ROD) were available for review by the general public, government agencies, and interested parties for a 30-day review period held from June 26, 2015 to July 27, 2015. The Notice of Availability of the Final EA was published in the *Hayward Daily Review* concurrent with the beginning of the review period. Copies of the Final EA were available for review at the locations listed in **Table 5-1**. All comments on the Final EA and Proposed Finding of No Significant Impact and ROD were considered by the Airport and the FAA before finalizing this revised Final EA. Comments received during the 30-day comment period on the Final EA and responses to those comments can be found in **Appendix F, Addenda and Responses to Comments**.

6 CHAPTER 6 ABBREVIATIONS

AAG – Average Annual Growth

AC – Advisory Circular

ACFCD – Alameda County Flood Control and Water Conservation District

ACHP – Advisory Council on Historic Preservation

AIP – Airport Improvement Program

ALP – Airport Layout Plan

AOA – Airport Operations Area

APE – Area of Potential Effect

ARC – Airport Reference Code

ARFF – Airport Rescue and Fire Fighting

ASA – Airport Study Area

ATCT – Air Traffic Control Tower

BAAQMD – Bay Area Air Quality Management District

BCDC – Bay Conservation and Development Commission

BMPs – Best Management Practices

CAA – Clean Air Act

CAAQS – California Ambient Air Quality Standards

CAC – Council Airport Committee

CARB – California Air Resources Board

CCM – California Coastal Management Program

CDFW – California Department of Fish and Wildlife

CEQ – Council on Environmental Quality

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

Chapter 6 – Abbreviations

CFR – Code of Federal Regulations
CFS – Cubic Feet Per Second
CNDDDB – California Natural Diversity Database
CNEL – Community Noise Equivalent Level
CNPS – California Native Plant Society
CO – Carbon Monoxide
CO₂ – Carbon Dioxide
CWA – Clean Water Act
CZMP – Coastal Zone Management Plan
Db – Decibel
DNL – Day-Night Average Sound Level
DOT – Department of Transportation
EA – Environmental Assessment
EIR – Environmental Impact Report
EIS – Environmental Impact Statement
EO – Executive Order
EPA - Environmental Protection Agency
ESA – Endangered Species Act
FAA – Federal Aviation Administration
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Map
FONSI – Finding of No Significant Impact
FPPA – Farmland Protection Policy Act
FWCA – Fish and Wildlife Coordination Act
GA – General Aviation
GHG – Greenhouse Gas

HARD –Hayward Area Recreation and Park District
HEC-RAS – Hydraulic Engineering Service River Analysis System
HGL – Hydraulic Grade Lines
HIRL – High Intensity Runway Lights
HWD – Hayward Executive Airport
MALSF – Medium Intensity Approach Lighting System with Sequenced Flashing
MALSR – Medium Intensity Approach Lighting System
MIRL – Medium Intensity Runway Lights
MITL – Medium Intensity Taxiway Lighting
MSL – Mean Seal Level
MSW – Municipal Solid Waste
NAAQS – National Ambient Air Quality Standards
NAHC – Native American Heritage Commission
NEPA – National Environmental Policy Act
NHPA – National Historic Preservation Act
NO₂ – Nitrogen Dioxide
NOAA – National Oceanic and Atmospheric Administration
NOI – Notice of Intent
NOx – Nitrogen Oxides
NPDES – National Pollutant Discharge Elimination System
NPIAS – National Plan of Integrated Airports System
NLP – National Priority List
NPS – National Park Service
NRC – National Response Center
NRCS – Natural Resource Conservation Service
NRHP – National Register for Historic Places

Chapter 6 – Abbreviations

NRI – Nationwide Rivers Inventory
NWI – National Wetlands Inventory
O₃ – Ozone
OFA – Object Free Area
OFZ – Obstacle Free Zone
OHWM – Ordinary High Water Mark
PAPI – Precision Approach Path Indicator
Pb – Lead
PG&E – Pacific Gas and Electric
PM – Particulate Matter
PPM – Parts Per Million
REIL – Runway End Identifier Lights
RJA – Ruggeri, Jenson, Azar
ROD – Record of Decision
RPZ – Runway Protection Zone
RSA – Runway Safety Area
RSAT – Runway Safety Action Team
RS&H – Reynolds, Smith and Hills
RWQCB – Regional Water Quality Control Board
SHPO – State Historic Preservation Officer
SIP – State Implementation Plan
SO₂ – Sulfur dioxide
SWRCB – State Water Resources Control Board
TAF – Terminal Area Forecast
TCP – Traditional Cultural Properties
TPD – Total Permitted Disposal

TSCA – Toxic Substances Control Act
USACE – United States Army Corps of Engineers
USC – United States Code
USDA – United States Department of Agriculture
USFWS – United States Fish and Wildlife Service
USGS – United States Geological Survey
UST – Underground Storage Tank
VASI – Visual Approach Slope Indicator
VOCs – Volatile Organic Compounds
WSRS – National Wild and Scenic Rivers System

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7 CHAPTER 7 REFERENCES

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8 CHAPTER 8

List of Preparers

8.1 Principal Reviewers

Responsibility for review of this EA rests with the FAA San Francisco ADO. Listed below are the identities and backgrounds of the principal FAA individuals in accordance with Council on Environmental Quality (CEQ) *Regulations* Section 1502.17, *List of Preparers*.¹⁰⁷

FAA

David B. Kessler, B.A., M.A., ACIP. 34 year experience. Regional Environmental Protection Specialist, Airports Division, Western Pacific Region.

Douglas R. Pomeroy, B.S., M.S. 31 years experience. Environmental Protection Specialist. Airports Division, San Francisco Airports District Office.

8.2 Principal Preparers

It is recognized that no one individual can be an expert in all of the environmental impact categories within this Draft EA. As a result an interdisciplinary team of researchers, technicians, and experts in various disciplines were required to prepare and complete the necessary documentation.

The lead consultant for preparation of this document is RS&H.

City of Hayward

Douglas McNeely, B.A., C.M., 28 years of experience. Airport Manager.

David Decoteau, B.S., M.B.A., C.M., 9 years of experience. Airport Operations Supervisor.

Reynolds, Smith & Hills

David J. Full, AICP, B.A. Urban Planning, M.U.P. 29 years of experience. Project Manager, QA/QC of all work products. Coordination with the FAA, City of Hayward, and the technical team members assisting in the preparation of this EA.

Edward Melisky, M.S. Environmental Planner. 36 years of experience. Responsible for this EA's quality assurance and compliance with NEPA, FAA Orders 1050.1E, 5050.4B, and the *Environmental Desk Reference for Airport Actions*.

David Alberts, B.A. Geography, 16 years of experience. Senior Environmental Planner. Responsibilities include, technical writing of Purpose and Need and Alternatives chapters.

Nicholas Kozlik, B.S. Environmental Studies, Planning Certificate, 5 years of experience. Responsible for document research, preparation, technical exhibit preparation, and coordination with technical team.

¹⁰⁷ Council on Environmental Quality, 40 CFR Section 1502.17, *List of Preparers*, November 1978.

LSA Associates

Ross A. Dobberteen, M.S. Biology; Ph.D. Environmental Science and Policy. 25 years of experience. Principal at LSA Associates, Inc., QA/QC for Fish Wildlife and Plants, Floodplains, Water Quality, and Wetlands sections of EA.

Matt Ricketts, M.S. Biology/Applied Ecology. 13 years of experience. Senior Wildlife Biologist at LSA Associates, Inc. Prepared Fish Wildlife and Plants, Floodplains, Water Quality, and Wetlands sections of EA.



