5. Environmental Consequences

This chapter presents the analysis of the environmental consequences associated with the three alternatives retained for further consideration. As described in Chapter 3, these alternatives are:

- Alternative 1 No Action
- Alternative 2 Proposed Runway 12L/30R with Charlie Helipad Option A
- Alternative 3 Proposed Runway 12L/30R with Charlie Helipad Option B

Alternative 1 would maintain the current configuration and operation of runways at HIO. The completion of the previously approved extension to Taxiway C will slightly increase maintenance activity and stormwater runoff. No construction impacts are associated with this alternative.

Under Alternatives 2 and 3, construction of the proposed parallel runway would occur in 2010 and 2011 with the first full year of operation in 2012. The new parallel runway would occupy the site of the current Charlie Helipad. Initially, helicopter operations would conduct training operations from Taxiway D, to be built parallel to the new runway. As traffic on Taxiway D increases, the relocated Charlie Pad would be built. Construction of the proposed relocated Charlie Helipad would occur in 2014 with the first full year of operation in 2015. The analysis of Alternatives 2 and 3 includes the impacts associated with construction and operation of the project alternatives.

This chapter provides the following information for each resource category in which environmental consequences were identified:

- Summary of impacts
- Regulatory setting, threshold of significance, and methodology
- Environmental impacts of alternatives
- Potential mitigation measures and measures to avoid and minimize impacts

FAA Orders 1050.1E, Change 1, and 5050.4B require the evaluation of airport development projects as they relate to the specific environmental resource categories outlined below, while the *FAA Environmental Desk Reference for Airport Actions* (FAA, 2007) provides supplemental information on assessing these impacts. Two resource categories identified in Appendix A of FAA Order 1050.1E, Change 1, Coastal Resources and Wild and Scenic Rivers, are not present and thus would not be affected by the Proposed Action and its alternatives. Therefore, they are not discussed in this chapter.

The sections listed below describe the environmental consequences of the three alternatives under consideration, including the construction and operational impacts of Alternatives 2 and 3. Chapter 6 discusses the consideration of cumulative impacts.

- 5.1 Noise
- 5.2 Compatible Land Use
- 5.3 Historical, Architectural, Archeological, and Cultural Resources

- 5.4 DOT Section 4(f) Resources
- 5.5 Socioeconomic Impacts, Environmental Justice, Children's Environmental Health and Safety Risks
- 5.6 Secondary (Induced) Impacts
- 5.7 Air Quality
- 5.8 Water Quality
- 5.9 Fish, Wildlife, and Plants
- 5.10 Wetlands
- 5.11 Floodplains
- 5.12 Hazardous Materials, Pollution Prevention, and Solid Waste
- 5.13 Farmlands
- 5.14 Energy Supply, Natural Resources, and Sustainable Development
- 5.15 Light Emissions and Visual Impacts
- 5.16 Summary of Impacts

5.1 Noise

This section describes the estimated noise impacts of the alternatives retained for detailed consideration. These alternatives include Alternative 1 - No Action, which serves as the basis of comparison for the analysis of noise impacts, and the two "build" alternatives: Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A and Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B. Appendix C.1 provides background information about noise metrics, definitions, and analyses.

5.1.1 Summary of Impacts

No residential or other noise-sensitive land uses are within the 65-decibel day-night average sound level (DNL 65) contours that define significant noise impact for any of the alternatives under consideration. (See Appendix C.1 for the definition of DNL and other noise metrics.) Therefore no noise-sensitive land uses would experience "significant" noise impacts and no mitigation would be required.

Table 5.1-1 summarizes the population, housing, and total area within the DNL 65 contour for each of the alternatives. As shown in the table, Alternatives 2 and 3 increase the size of the area covered by the DNL 65 when compared to Alternative 1, the no action condition. The DNL 65 contours for each project alternative are shown in Exhibits 5.1-1 and 5.1-2. These contour maps show that, for all of the alternatives under consideration, significant noise levels (DNL 65+) would remain on-airport. Alternatives 2 and 3 would have virtually the same effect in shifting significant noise level to the north compared to Alternative 1. The project alternatives would increase significant noise levels on Airport property to the north and northeast, while slightly reducing noise levels to the south and west.

Scenario	Population	Housing	Total Area in the DNL 65 Contour (acres)		
2007	0	0	226		
2012					
Alternative 1	0	0	276		
Alternative 2	0	0	317		
Alternative 3	0	0	317		
2015					
Alternative 1	0	0	285		
Alternative 2	0	0	328		
Alternative 3	0	0	328		

TABLE 5.1-1

Source: INM 7.0, ESA Airports Analysis.



Source: ESA Airports, 2008.

Exhibit 5.1-1 2012 DNL 65 Comparison



Exhibit 5.1-2 2015 DNL 65 Comparison

5.1.2 Regulatory Setting, Threshold of Significance, and Methodology

Federal regulations related to aviation noise are identified in two primary sources: FAA Order 1050.1E, Change 1, Environmental Impacts: Policies and Procedures (Order 1050.1E) and Title 14--Aeronautics and Space Chapter I, Federal Aviation Administration, Department of Transportation Subchapter I Airports, Part 150 - Airport Noise Compatibility Planning (Federal Aviation Regulations [FAR] Part 150). The Oregon Administrative Rules Chapter 340 also establishes a noise criterion for compatible land use planning around airports.

5.1.2.1 Applicable Regulations and Standards

As noted above, FAA noise compatibility criteria are based on the DNL metric described in Appendix C.1. In accordance with the requirements of the Noise Control Act of 1972, the EPA recommended the DNL as the principal metric for aircraft noise analysis. Pursuant to the Aviation Safety and Noise Abatement Act (ASNA) of 1979, the FAA and other federal agencies adopted the DNL metric for measuring noise and for land use planning. This metric reflects the number of noise events experienced over a given period of time as well as the acoustic energy or loudness of these events by accounting for the total acoustic energy generated during that period. In addition, the DNL reflects the additional annoyance of noise generated during the nighttime hours (10:00 p.m. to 6:59 a.m.) when people are normally more sensitive to intrusive sound events. The DNL metric is designed to assess community annoyance. Appendix C.1 also describes other metrics that may be used to describe and evaluate specific aspects of noise exposure.

FAA Order 1050.1E, Change 1, requires that noise impacts be identified using the most recent FAA Integrated Noise Model (INM) or other FAA-approved noise model.

The Oregon Administrative Rules Chapter 340, Section 340-035-0045 (1) identifies the specifics pertaining to noise control regulations surrounding airports and establishes an airport noise criterion. The criterion "is established to define a perimeter for study and for noise sensitive use planning purposes." The criterion is defined as the DNL 55.

5.1.2.2 Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 14.3 states that:

A significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB when compared to the no-action alternative for the same timeframe.

Section 5.1.4 describes the expected noise effects of the project alternatives. The noise analysis focused on determining whether any of the alternatives' noise impacts would exceed the threshold of significance.

5.1.2.3 Methodology

The FAA has determined that the cumulative noise exposure resulting from aviation activity must be measured or examined using DNL. The INM Version 7.0, the most current version of the model when this analysis began, was used in this EA. INM Version 7.0 incorporates the capability of the Heliport Noise Model (HNM) to model helicopter noise. Appendix C.1 describes the assumptions used to develop input for the INM.

The methodology for assessing potential noise impacts included preparing DNL contours for Alternative 1 - No Action, Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A, and Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B for the years 2012 and 2015. The contours were prepared to determine whether any noise-sensitive land uses would experience a significant increase in aircraft noise exposure as a result of the proposed action.

The number of dwelling units within the DNL contours was determined by overlaying the contours onto recent satellite photography and visually estimating the number of dwelling units located within each contour. Population estimates were based on census bureau data. The data show that in 2000, an average of 2.76 persons resided in each household within the city of Hillsboro. For the DNL 65 contours for all of the alternatives, there were no households within the noise contours. Therefore, there is no population within the DNL 65 contours for any alternative.

In addition to preparing DNL contours, supplemental time above a specified noise level (TA) and number of events above a specified noise level (NA) have also been prepared. These analyses were performed to provide additional information about the future noise conditions, but there are no applicable significance thresholds for these criteria. Therefore, these metrics are for information only and not used to assess impacts. This analysis is included in Appendix C.1.

5.1.3 Environmental Impacts of Alternatives

This section presents the estimated DNL contours for each alternative and identifies whether any noise-sensitive land uses would be exposed to a significant noise increase as a result of the proposed action. Exhibits 5.1-3 through 5.1-7 show the DNL contours for the alternatives under consideration (these exhibits are located at the end of this section).

5.1.3.1 Alternative 1 - No Action

Completion of the Taxiway C extension would not alter aircraft flight patterns compared to existing conditions, but rather would improve the movement of taxiing aircraft. Exhibit 5.1-3 shows the 2012 DNL contours for Alternative 1. These contours are larger than the 2007 DNL contours due to the forecast increase in operations, although significant noise levels (DNL 65 and above) remain on the Airport. Specifically, the largest increase in the DNL contours occurs along the extended centerline of Runway 12/30. This increase is due primarily to the forecast growth in jet operations from 7,008 in 2007 to 12,879 operations projected in 2012. The contours in this area are dominated by local helicopter training activity. Helicopter training activity is projected to remain at 88,200 annual operations through 2015. It is estimated that 820 individuals reside in the 2012 Alternative 1 DNL 55-60 contours. No residences or other noise-sensitive land uses are within the DNL 60 and greater contours, which includes the DNL 65 contour.

Exhibit 5.1-4 shows the 2015 Alternative 1 DNL contours. These contours are slightly larger than the 2012 contours due to the 4 percent increase in operations forecast between 2012 and 2015. Significant noise levels would continue to be restricted to Airport property. It is estimated that 890 individuals reside in the 2015 Alternative 1 DNL 55-60 contours. No residences or other noise-sensitive land uses are within the DNL 60 and greater contours.

5.1.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

The physical and operational characteristics of Alternative 2 are described in Section 3.2.2. Projected runway use and flight track geometry were estimated in consultation with Port staff and the HIO air traffic control tower (ATCT) manager. The proposed addition of Runway 12L/30R requires that the current Charlie Helipad northeast of existing Runway 12/30 be relocated slightly further to the northeast. As a result, the associated helicopter training pattern, the "Charlie Pattern," would also shift slightly to the northeast. This alternative differs from Alternative 3 in that the relocated Charlie Helipad would be approximately 450 feet southeast of the relocated helipad site in that alternative. Appendix C.1 describes these runway and flight track use assumptions. These changes would not result in a significant noise impact.

Construction Impacts

Construction impacts would be temporary. As noted in the introduction to Chapter 5, construction of the proposed parallel runway would occur in 2010 and 2011. Construction of the relocated Charlie Helipad would occur in 2014. Construction activities associated with the relocated helipad would be similar to those associated with the parallel runway, but because the amount of construction would be less, the associated impacts would be of shorter duration.

Construction noise may be caused by heavy equipment used for earth moving onsite as well as heavy trucks required to haul materials to the site. Chapter 8.24 of the Washington County Code identifies noise regulations that would apply to construction activity at HIO. In general, construction noise is exempt from these regulations Monday through Saturday between the hours of 7:00 a.m. and 7:00 p.m. Construction activity is not exempt on Sundays or during nighttime hours; any planned construction during those times that may affect nearby noise-sensitive land uses would require a noise variance from the County.

Construction activity would occur in the northeast quadrant of HIO, an area surrounded by agricultural and industrial land uses. Several isolated houses are also located in this general area. Construction would adhere to Chapter 8.24 of the Washington County Code. In addition, construction vehicles would use designated haul routes consisting of major arterials in the Hillsboro area. Appendix C-1 describes the analysis of potential construction noise impacts associated with site preparation and runway construction in greater detail. A summary of construction impacts follows.

Site Preparation. Noise-producing equipment typically used during the preparation stage includes excavators, haul trucks, loaders, and vibratory equipment. Maximum noise levels could reach 93 dBA at 50 feet from the equipment during normal construction activities during this phase. Other, less intensive noise-producing equipment expected to be used during this phase includes backhoes, air compressors, forklifts, and pumps. Haul trucks would also be expected to bring supplies and equipment to the site. Typical maximum noise levels for haul trucks range from 78 to 84 dBA for trucks traveling at 40 to 50 miles per hour at a distance of 50 feet. Construction traffic would also include service and utility trucks, although these vehicles are not as loud as heavy trucks.

Runway Construction. The loudest noise sources in use during construction of the runway and associated taxiways could include soil compactors, pavers, loaders, concrete saws, and haul trucks. The pavers and haul trucks would be used to apply the final surface on the runways. During the paving, haul trucks would haul the paving materials to the site. Maximum noise levels would range from 89 to 92 dBA at 50 feet from the equipment. Other noise sources would

include air compressors, concrete saws, pumps, service and utility trucks, and tractor trailers. Maximum noise levels would range from 70 to 80 dBA at 50 feet from the equipment.

Although construction noise is not typically expressed in terms of DNL, these noise levels were also estimated to ensure that they would not exceed FAA thresholds of significance (DNL 65). The analysis documented in Appendix C-1 shows that predicted daily noise levels range from DNL 45 to 59 at the individual residences closest to the project site. This analysis indicates that cumulative daily noise levels at these closest receptors would range from DNL 49 to 59, well below the federal threshold of significant impact.

Estimates of vibration generated by construction activity were compared to U.S. Department of Transportation guidelines for acceptable vibration levels from construction activities. The guidelines recommend that the maximum peak-particle velocity levels remain below 1.27 inches per second at structures nearest the construction site. Vibration levels above 1.27 inches per second have the potential to cause architectural damage to normal dwellings. None of the construction activities required for construction of Alternative 2 would approach this level (see Appendix C-1).

Operational Impacts

Compared to the No Action Alternative noise contours shown above, the Alternative 2 contours decrease in size in the southeast, increase in the northwest, and widen to the east in the vicinity of the proposed runway. These changes are primarily due to the physical location of the proposed runway. The Airport operates in a northwest flow more than 80 percent of the time, with aircraft landing from the southeast and departing to the northwest. The southern end of the new parallel runway would be approximately 2,500 feet north of the southern end of Runway 12R/30L, the existing main runway. As a result, aircraft that operate from Runway 30R would begin their take-off roll farther to the northwest than they do today (using the current Runway 30). Also, aircraft landing on the new Runway 30R would touch down at a point that is farther northwest than the current Runway 30 touchdown point. Exhibit 5.1-5 shows the 2012 DNL contours for Alternatives 2 and 3. The effects of these alternatives are the same for 2012 because in both cases the runway and taxiway configuration is the same and helicopters using the Charlie Pattern would use Taxiway D. The helicopter flight activity associated with the Charlie Pattern would therefore shift 240 feet to the northeast of the existing Charlie Pattern (perpendicular to Runway 12R/30L). No residences or other noise-sensitive land uses would be within the DNL 65 and greater noise contours. An estimated 20 individuals would reside within the DNL 60-65 contour range. About 480 individuals would reside in the 2012 Alternative 2 DNL 55-60 contour range, a 41 percent reduction compared to the No Action Alternative. The greatest decrease would occur southeast of the Airport, specifically in the area of West Baseline Road and Northeast 53rd Avenue.

Exhibit 5.1-6 shows the 2015 DNL contours for Alternative 2. These contours are slightly larger than the 2012 contours due to the forecast increase in operations, which would also occur in the no action condition. Upon construction of the relocated Charlie Helipad, to be located 500 feet to the northeast of the existing helipad location, the associated Charlie Pattern would also shift 500 feet to the northeast (again, perpendicular Runway 12R/30L). No residences or other noise-sensitive land uses would be within the DNL 65 and greater noise contours. An estimated 20 individuals would reside in the DNL 60-65 contour interval in 2015. About 570 individuals would reside in the 2015 DNL 55-60 contours, a 36 percent reduction compared to 2015 No Action Alternative.

No noise-sensitive land use would experience a significant impact (DNL 1.5 dBA increase in noise at or above DNL 65) as a result of the operation of this alternative in either 2012 or 2015. Operation of Alternative 2 would have the effect of shifting noise contours to the north and east. In general, this shift moves the contours toward farmland and away from more densely populated areas to the south of the Airport. This shift is responsible for the reduction in population within the DNL 55 noise contours in 2012 and 2015.

5.1.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

The physical and operational characteristics of Alternative 2 are described in Section 3.2.3. Under Alternative 3, the relocated helipad would be approximately 450 feet northwest of its site in Alternative 2. Consequently, the Charlie Pattern would also shift slightly to the northwest. This shift is the only change affecting noise when comparing Alternatives 2 and 3. These changes resulting from Alternative 3 would not result in a significant noise impact.

Construction Impacts

Temporary construction impacts would be the same as those described for Alternative 2 above. The only difference between these two alternatives is the location of the proposed Charlie Helipad. As noted above, the Charlie Helipad would be located about 450 feet north of the helipad location for Alternative 2. This change does not materially affect the construction effort required to build the helipad.

Operational Impacts

The impacts for Alternative 3 are essentially the same as for Alternative 2. As with Alternative 2, comparing the 2012 Alternative 3 contours with the 2012 Alternative 1 (No Action) contours shows that the alternative would decrease the size of the contour in the southeast, increase it in the northwest, and widen it to the east in the vicinity of the proposed runway.

As noted above, Exhibit 5.1-5 shows the 2012 DNL contours for both Alternative 2 and Alternative 3. As in Alternative 2, the Charlie Pattern and the associated helicopter flight tracks would shift 240 feet to the northeast of the existing Charlie Pattern. No residences or other noise-sensitive land uses would occur in the DNL 65 and greater contours. An estimated 20 individuals would reside in the DNL 60-65 contour range in 2012. About 480 individuals would reside in the 2012 55-60 contours range, a 41 percent reduction compared to No Action Alternative. As with Alternative 2, the reduction of noise exposure would occur southeast of the Airport, specifically in the area of West Baseline Road and Northeast 53rd Avenue.

Exhibit 5.1-7 shows the 2015 DNL contours for Alternative 3. These contours are slightly larger than the 2012 contours due to the 4 percent increase in operations forecast between 2012 and 2015. Upon construction of the relocated Charlie Helipad, the associated Charlie Pattern would shift 500 feet to the northeast of the existing Charlie Pattern (perpendicular to Runway 12L/30R) and 450 northwest of the relocated Charlie Pattern in Alternative 2. No residences or other noise-sensitive land uses would occur within the DNL 65 and greater contours. An estimated 20 individuals would reside in the DNL 60-65 contour range for this alternative. About 580 individuals would reside in the 2015 Alternative 3 DNL 55-60 contours, a 35 percent reduction compared to No Action Alternative.

As with Alternative 2, no noise-sensitive land use would experience a significant impact (DNL 1.5 increase in noise at or above DNL 65) as a result of the operation of this alternative in either 2012 or 2015. Operation of Alternative 3 would have the effect of shifting noise contours to the

north and east. In general, this shift would move the contours toward farmland and away from more densely populated areas to the south of the Airport. As in Alternative 2, this shift is responsible for the reduction in population within the DNL 55 noise contours in 2012 and 2015.

5.1.4 Mitigation and Measures to Avoid and Minimize Impacts

No noise-sensitive areas are within the DNL 65 or greater contour. The DNL 65 noise contour does not go beyond the Airport boundary. No noise-sensitive area would experience a DNL 1.5-dB increase at or above DNL 65 as a result of Alternative 2 or 3; thus, no mitigation is required. Although no residential or other noise-sensitive land uses are projected within DNL 65 or higher contours for existing conditions, or any of the alternatives under consideration, the Port will continue efforts to minimize noise impacts to the Hillsboro community. Currently, a preferential runway use policy is practiced, limiting unnecessary overflight of residential areas to the south and west of the Airport. A formal engine run-up policy has been established to direct turbine powered aircraft to specific locations on the airfield for run-up activity; the program also restricts the number of run-ups conducted as part of scheduled maintenance between the hours of 10 p.m. and 7 a.m., Helicopter training flights are conducted in patterns defined by clearly visible landmarks, they are typically used only during daylight hours, and usage of the patterns is prioritized by lowest over flown population first.

Future program elements incorporating GPS-based navigational procedures designed to guide aircraft over less populated areas will be added when possible.

The Port's standard construction specifications state that the construction activity must comply with local noise ordinances. Operation of construction equipment in the city of Hillsboro is prohibited without a noise variance during evening or nighttime hours (7 p.m. to 7 a.m.) or on Sundays or legal holidays.



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5.2 Compatible Land Use

This section describes the estimated effects of the alternatives retained for detailed consideration with respect to compatible land use. These alternatives include Alternative 1 - No Action, which serves as the basis of comparison for the analysis of impacts, and the two project alternatives: Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A and Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B. The analysis of compatible land use addresses the following considerations:

- Compatibility with surrounding land uses on the basis of projected noise levels and nearby receptors.
- Compatibility with land use plans in the Hillsboro area.
- Actions taken to ensure that the land use in the Airport environs remains compatible with the normal operation of the Airport.

5.2.1 Summary of Impacts

As discussed in Section 5.1, none of the alternatives under consideration would result in significant noise levels extending beyond the Airport boundaries, and no residential or other noise-sensitive land uses would fall within the DNL 65 contours for any of these alternatives. The Airport is consistent with City of Hillsboro and Washington County land use plans and policies. None of the alternatives would require annexation or relocation that would disrupt land use patterns in the Airport environs. None of the alternatives would create incompatible land use and no mitigation would be required.

5.2.2 Regulatory Setting, Threshold of Significance, and Methodology

This section describes the regulations applicable to compatible land use, the thresholds used to determine the significance of compatible land use impacts, and the methodology used to evaluate impacts.

5.2.2.1 Applicable Regulations and Standards

This section discusses the federal and state regulations and policies related to aviation noise and compatible land use, and the land use planning guidelines established by the City of Hillsboro and Washington County with respect to aviation noise and safety in the Airport environs.

Federal Land Use Compatibility Guidelines

Appendix A of FAR Part 150 provides the following guidance:

To determine the extent of the noise impact around an airport, airport proprietors developing noise exposure maps in accordance with this part must develop DNL contours. Continuous contours must be developed for DNL levels of 65, 70, and 75 (additional contours may be developed and depicted when appropriate).

Table 5.2-1, FAA Land Use Compatibility Guidelines, shows that, according to federal guidelines, all land uses are compatible with noise levels less than DNL 65.

INDEE OLE I	
FAA Land Use Compatibility Guidelines	batibility Guidelines

	Yearly Day-Night Average Sound Level (DNL) (decibels					ls) ^a
Land Use	<65	65-70	70-75	75-80	80-85	> 85
Residential						
Residential, other than mobile homes and transient lodging	Y	N ^b	N ^b	Ν	Ν	Ν
Mobile home parks	Y	Ν	Ν	Ν	Ν	Ν
Transient lodging	Y	N ^b	N ^b	N ^b	Ν	Ν
Public Use						
Schools	Y	N ^b	N ^b	Ν	Ν	Ν
Hospitals and nursing homes	Y	25	30	Ν	Ν	Ν
Churches, auditoriums, and concert halls	Y	25	30	Ν	Ν	Ν
Governmental services	Y	Y	25	30	Ν	Ν
Transportation	Y	Y	Y ^c	Y^{d}	Y ^e	Y ^e
Parking	Y	Y	Y ^c	Y^{d}	Y ^e	Ν
Commercial						
Offices, business, and professional	Y	Y	25	30	Ν	Ν
Wholesale and retail building materials, hardware, and farm equipment	Y	Y	Y ^c	Y ^d	Y ^e	Ν
Retail trade, general	Y	Y	25	30	Ν	Ν
Utilities	Y	Y	Y ^c	Y^d	Y ^e	Ν
Communication	Y	Y	25	30	Ν	Ν
Manufacturing						
Manufacturing, general	Y	Y	Y ^c	Y^d	Y ^e	Ν
Photographic and optical	Y	Y	25	30	Ν	Ν
Agriculture (except livestock) and forestry	Y	Y ^f	Y ^g	\mathbf{Y}^{h}	\mathbf{Y}^{h}	Y^h
Livestock farming and breeding	Y	Y^f	Y ^g	Ν	Ν	Ν
Mining and fishing— resource production and extraction	Y	Y	Y	Y	Y	Y

TABLE 5.2-1
FAA Land Use Compatibility Guidelines

	Yearly Day-Night Average Sound Level (DNL) (decibels) ^a					
Land Use	<65	65-70	70-75	75-80	80-85	> 85
Recreational						
Outdoor sports arenas and spectator sports	Y	Y ⁱ	Y ⁱ	Ν	Ν	Ν
Outdoor music shells and amphitheaters	Y	Ν	Ν	Ν	Ν	Ν
Nature exhibits and zoos	Y	Y	Ν	Ν	Ν	Ν
Amusements, parks, resorts, and camps	Y	Y	Y	Ν	Ν	Ν
Golf courses, riding stables, and water recreation	Y	Y	25	30	Ν	Ν

^aY (Yes) = Land use and related structures compatible without restrictions.

N (No) = Land use and related structures are not compatible and should be restricted.

25, 30, or 35 = Land use and related structure generally compatible; measures to achieve outdoor-to-indoor noise level reduction (NLR) of at least 25, 30, or 35 decibels (dB) must be incorporated into design and construction of structure.

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

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

^dMeasures to achieve NLR 30 dB should be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or the normal level is low.

^eMeasures to achieve NLR 35 dB should be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or the normal level is low.

^fResidential buildings require an NLR of 25.

⁹Residential buildings require an NLR of 30.

^hResidential buildings not permitted.

ⁱLand-use-compatible provided special sound reinforcement systems are installed.

Source: FAA FAR Part 150, Table 1.

The Airport Sponsor must provide a written assurance verifying action has been or will be taken to restrict land uses next to or near the airport as discussed in 49 United States Code Section 47107(a)(10)). This documentation is provided in Appendix C.1.

Oregon Administrative Rules

The Oregon Administrative Rules Chapter 340, Section 340-035-0045 establishes an airport noise criterion to "... define a perimeter for study and for noise sensitive use planning purposes." The criterion is defined as the DNL 55 and is included in the noise analysis for informational purposes.

The Oregon Land Conservation and Development Commission (LCDC) adopted the Airport Planning Rule (OAR 660, Division 13) to refine the provisions for local government airport

regulation contained in Statewide Planning Goal 12 (Transportation) and the Transportation Planning Rule. The rule implements Oregon Revised Statutes 836.600 through 836.630. Under this section, plan and land use regulations requirements must "encourage and support the continued operation and vitality of airports."

City of Hillsboro Comprehensive Plan

The City of Hillsboro Comprehensive Plan establishes several policies promoting compatible land use planning in the Airport environs.1 Section 7, Air, Water and Land Use Resource, encourages limiting land inside the DNL 60 contours to commercial, industrial, and low-density residential uses. Section 13, Transportation, prohibits land uses in airport noise corridors that are not noise compatible and that can cause physical hazards to air traffic. This section also requires developers to inform the Department of Environmental Quality (DEQ) at the earliest opportunity of transportation system development projects that may affect their jurisdictional interests, to ensure identification of noise standards. The Airport subsection of the Transportation section also states that HIO shall be maintained and used as a general aviation reliever airport.

Washington County Comprehensive Plan

The Washington County Comprehensive Plan was amended in 2003 to address the state Airport Planning Rule. The Comprehensive Plan contains several airport-related policies. Policy 28, Airports, states that "It is the policy of Washington County to protect the function and economic viability of existing public use airports, while ensuring public safety and compatibility between airport uses and surrounding land uses for public use airports and for private use airports identified by the Oregon Department of Aviation (DOA)." The policy also states that the County will coordinate with the City of Hillsboro to help ensure compatibility of surrounding land uses with HIO.

Hillsboro Airport Land Use Planning

The Port is the sponsor of the Hillsboro Airport Issues Roundtable (HAIR). In 2007 and 2008, this sub-committee held approximately 20 public planning meetings as well as 3 public open houses to solicit input and comments on draft language for an Airport Use Zone and an Airport Safety and Compatibility Overlay Zone. These two zone change recommendations were developed in accordance with the Oregon Airport Planning rule (OAR 660-13), as well as inputs from the states of Washington and California airport land use planning handbooks. Currently, the recommendations of the HAIR land use subcommittee are being considered by the Hillsboro Planning Commission who will then forward these on to the Hillsboro City Council for adoption. It is anticipated that the City process will be complete by the end of 2009. The County plans to review this issue during their next hearings season in the spring of 2010. It will be the responsibility of the City of Hillsboro and Washington County to implement any changes to the local zoning codes.

5.2.2.2 Threshold of Significance

Determining significance under NEPA is guided by FAA Order 1050.1E, Change 1, Environmental Impacts: Policies and Procedures Appendix A, Section 4.3 and FAA Order 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions. For compatible land use impacts, FAA Order 1050.1E refers to the thresholds for noise. A significant

HILLSBORO AIRPORT PARALLEL RUNWAY 12L/30R ENVIRONMENTAL ASSESSMENT

¹ Source: Hillsboro Airport Compatibility Study Update, Coffman Associates, November 2005.

impact would occur if analysis shows that the proposed action would cause noise-sensitive areas to experience an increase in noise of DNL 1.5 dBA or more at or above DNL 65 when compared to the No Action Alternative for the same time frame.

Chapter 5 of the FAA Environmental Desk Reference for Airport Actions provides the following additional guidance on determining significance in stating that if the noise analysis:

...concludes that there is no significant noise impact, a similar conclusion usually may be made about compatible land uses. Also, if the action would cause noise impacts that affect land uses such as social or induced socioeconomic effects (e.g., community disruption, relocation impacts, etc.), analyze those effects in the context of the affected resource(s). Therefore, describe those impacts in the appropriate chapter of the environmental document that addresses those resources. To avoid duplicating that information, the document's Compatible Land Use chapter should cross-reference the pages in those chapters containing that information.

5.2.2.3 Methodology

The assessment of potential compatible land use impacts draws on the analysis of noise impacts described in Section 5.1 to determine the effects of the alternatives under consideration with respect to federal criteria. The analysis also examines the consistency of these alternatives with state and local land use policies through reference to the policies identified in the Hillsboro Airport Compatibility Study.² Current land use planning and zoning information is derived from Metro data (February 2009 data set from Metro's Data Resource Center).³

5.2.3 Environmental Impacts of Alternatives

This section identifies whether any significant compatible land use impacts would occur as a result of the proposed action. For the purposes of NEPA, compatible land use impacts are determined by assessing changes within the DNL 65 contours for the proposed action compared to those associated with the No Action Alternative. Consistent with State of Oregon law, the DNL 55 contours have been included on all the exhibits in Section 5.1. In accordance with Oregon Administrative Rules Chapter 340, Section 340-035-0045, these contours are provided to "...define a perimeter for study and for noise sensitive use planning purposes."

As described in Section 4.3.2 the area immediately surrounding the Airport is planned for commercial, employment, and agricultural uses that are compatible with Airport operations. As noted above, operation of HIO as a GA reliever airport is consistent with City of Hillsboro and Washington County land use policies. None of the alternatives under consideration would conflict with local land use plans and policies. Appendix A includes letters from the City of Hillsboro and Washington County documenting that the Airport is consistent with applicable land use plans.

5.2.3.1 Alternative 1 - No Action

Alternative 1 is the no action condition. DNL contours for Alternative 1 for 2012 and 2015 are shown in Exhibits 5.1-3 and 5.1-4. The DNL 65 contour, used to define compatible land use, would be entirely on Airport property and would not contain any residences or other noise-sensitive uses.

² Hillsboro Airport Compatibility Study Update, Coffman and Associates, November 2005.

³ http://rlismetadata.oregonmetro.gov/.

5.2.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A.

This section describes the impacts on land use associated with Alternative 2 during construction and operation. No significant impacts on land use were identified for Alternative 2.

Construction Impacts

Construction activity associated with this alternative would not alter surrounding community development and would have no impacts on land use.

Operational Impacts

DNL contours for Alternative 2 for 2012 and 2015 are shown in Exhibits 5.1-5 and 5.1-7. As is the case for Alternative 1, the DNL 65 contour would be entirely on Airport property and would not contain any residences or other noise-sensitive uses. Implementation of Alternative 2 would not cause noise-sensitive areas to experience an increase in noise of DNL 1.5 dBA or more at or above DNL 65, and would not result in social or induced socioeconomic effects. The analysis documented in Section 5.6, Secondary (Induced) Impacts, demonstrates that implementation of this alternative would not alter existing patterns of land use or surface transportation, or otherwise disrupt surrounding development patterns. This alternative would not, therefore, cause significant compatible land use impacts.

5.2.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on land use associated with Alternative 3 during construction and operation. No significant impacts on land use were identified for Alternative 3.

Construction Impacts

The construction impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

Operational Impacts

The DNL contours used to define compatible land use for Alternative 3 for 2012 and 2015 are shown in Exhibits 5.1-6 and 5.1-7. The operational impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

5.2.4 Mitigation and Measures to Avoid and Minimize Impacts

No noise-sensitive areas would be exposed to DNL 65 or higher, nor would any receptors experience a DNL 1.5-dBA increase within the DNL 65 as a result of the proposed action; thus no mitigation is required.

5.3 Historical, Architectural, Archaeological, and Cultural Resources

This section reviews the federal and state regulations that require the identification and assessment of historic, archaeological and other cultural resources in the HIO Area of Potential Effect (APE). It provides information on the investigations conducted and the results of those investigations. Consequences of Alternatives 1, 2 and 3 are discussed in light of these results.

Historic properties are defined as buildings, sites, districts, structures, and objects significant in American history, archeology, architecture, engineering, or culture, and worthy of preservation. Archaeological resources are the material remnants of past human life or activities; these resources may include artifacts (individual items such as complete or broken arrowheads or bottles at least 50 years old) and features (e.g., fire hearths, foundations) that may co-occur at locations identified as archaeological sites. Historical built resources are standing buildings or other structures that are at least 50 years old.

5.3.1 Summary of Impacts

No archaeological or historic resources on or eligible for listing on the National Register of Historic Places (NRHP) were found in the project Area of Potential Effect (APE) (Appendix C.2). Two built historical resources were identified in the APE, but both were assessed as *not eligible* for the NRHP (Appendix C.2). The background research and field observations conducted in this analysis indicate that a "No Properties Affected" determination by the FAA in consultation with the Oregon State Historic Preservation Office (SHPO) is appropriate. SHPO concurred with this determination on June 12, 2009.

5.3.2 Regulatory Setting, Threshold of Significance, and Methodology

Archaeological and built historical resources that may be affected by a proposed project requiring FAA approval are protected under federal and state regulations. This section identifies the applicable regulations and thresholds of significance. It also reviews the methods used to identify cultural resources in the APE.

5.3.2.1 Applicable Regulations and Standards

An airport improvement project, such as the proposed Parallel Runway 12L/30R, that requires FAA approval, permits, and/or funding is a federal undertaking under Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to identify cultural resources listed in, or eligible for listing in, the NRHP and to assess the effects that their undertakings may have on those resources (as implemented through 36 CFR Part 800). To be listed on, or eligible for listing on the NRHP, a resource must meet one of the following requirements (36 CFR 60.4):

- a) Be associated with events that have made a significant contribution to the broad patterns of our history
- b) Be associated with the lives of persons significant in our past,
- c) Embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent

a significant and distinguishable entity whose components may lack individual distinction,

d) Have yielded, or may be likely to yield, information important in prehistory or history.

In most cases, a resource must be at least 50 years old to be considered for eligibility.

Hillsboro Airport is owned by the Port and is also subject to Oregon state laws, which also protect archaeological sites and human burials, if identified (Oregon Revised Statutes [ORS] 97.740-97.760, 358.905-358.955, and 390.235).

5.3.2.2 Threshold of Significance

For federal airport actions, the FAA is responsible for meeting the requirements of Section 106 of the NHPA and its implementing regulations. Individual resources considered under Section 106 are assessed for NRHP eligibility using the National Register Criteria for Evaluation (36 CFR Section 60.4). Sites of "archaeological significance" under Oregon law are likewise defined as NRHP-listed or -eligible sites. Sites identified in writing by an Indian tribe are also sites of archaeological significance (ORS 358.905). The FAA consults with the Oregon SHPO and interested Indian tribes regarding the identification and evaluation of NRHP-eligibility of cultural resources found in the APE. A significant impact could occur if consultation with the SHPO or a tribe resulted in a "Finding of Adverse Effect," although this finding does not automatically result in a significant impact.

5.3.2.3 Methodology and Assumptions

The Area of Potential Effect (APE) was defined for this project as the area affected by significant aircraft noise exposure, as defined by the DNL 65 noise exposure contour for the 2015 condition because historic buildings could be adversely affected by increases in noise levels. The APE also reflects the limits of construction disturbance, which could affect archaeological resources, referred to as the archaeological study area (Exhibit 5.3-1).

The project team undertook investigations to determine if previously recorded archaeological or historical resources were present in the APE and to identify additional resources in the field. Background literature and historical maps of the region, archaeological site and project records maintained by the Oregon SHPO, and the SHPO Historic Sites Database for built resources and National Register listings were reviewed, and field surveys were conducted to identify archaeological resources and built historical resources. A systematic pedestrian archaeological survey of the proposed parallel runway archaeological study area was conducted to locate any surface evidence of prehistoric or historical archaeological artifacts, features, or sites. A windshield survey of properties within the APE evaluated properties 45 years or older, to ensure that resources that would become 50 years old during the course of the Parallel Runway 12L/30R Project were considered. These investigations resulted in technical memoranda for archaeological resources and for historic resources (Appendix C.2). This memorandum was provided to the Oregon SHPO with a letter requesting concurrence with the finding of "No Properties Affected."



(Hillsboro 7.5" USGS quadrangle)

EXHIBIT 5.3-1 Area of Potential Effect and Archaeological Study Area Hillsboro Airport Parallel Runway 12L/30R Environmental Assessment

5.3.3 Environmental Impacts of Alternatives

This section reviews the potential impacts that the alternatives under consideration may have on archaeological or built historical resources. The studies reviewed above found that no archaeological resources or built historical resources are present in the APE. Thus, none of the alternatives would result in impacts to archaeological or built historical resources.

5.3.3.1 Alternative 1 - No Action

The No Action Alternative would not entail acquisitions or additional physical development. This alternative would also maintain the current configuration and operation of runways at HIO. It would not alter aircraft activity levels or flight patterns compared to existing conditions. As described in Section 5.1, significant noise levels would remain on-airport and would not affect known historic, architectural, archaeological and cultural resources. Therefore no impacts on archaeological or historic resources would result from this alternative.

5.3.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts on archaeological and historic resources associated with Alternative 2 during construction and operation. No significant impacts on archaeological or historic resources were identified for Alternative 2.

Construction Impacts

No archaeological or built historical resources are present in the APE, so no impacts would result from construction of this alternative.

Operational Impacts

No archaeological or built historical resources are present in the APE area, so no impacts would result from operation of this alternative.

5.3.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on archaeological and historic resources associated with Alternative 3 during construction and operation. No significant impacts on archaeological and historic resources were identified for Alternative 3.

Construction Impacts

The construction impacts of Runway 12L/30R with Charlie Helipad Option B would be the same as those for Alternative 2.

Operational Impacts

The impacts of operating Runway 12L/30R with Charlie Helipad Option B would be the same as those for Alternative 2.

5.3.4 Mitigation and Measures to Avoid and Minimize Impacts

No archaeological or built historical resources have been found in the project APE. No mitigation measures are necessary, but unanticipated finds of buried archaeological materials might occur.

Archaeological sites and, in particular, Indian burials are protected under Oregon state law (ORS 97.740-97.760, 358.905-358.955, ad 390.235), and by federal regulations where federal funds

or permits are involved (e.g., 36 CFR Part 800, 43 CFR 7.4, 43 CFR 10.4). Disturbance of graves is specifically prohibited, even through accidental discovery and even if reviewing agencies have concurred that a specific project is in compliance with applicable state and federal regulations. If archaeological resources or potential human remains are encountered during the Parallel Runway 12L/30R Project, all earth disturbance in the vicinity of the find will be halted immediately, in accordance with state and federal laws, and the FAA and Port will be notified. A qualified archaeologist will be consulted to investigate and evaluate the discovery and to recommend subsequent courses of action in consultation with the FAA, the Port, the Oregon SHPO, and the appropriate tribes.

5.4 DOT Section 4(f)

This section describes the consequences of the No Action Alternative and Alternatives 2 and 3 of the Hillsboro Airport Parallel Runway 12L/30R Project with respect to resources subject to U.S. Department of Transportation Act (DOT) Section 4(f), and resources subject to Land and Water Conservation Fund Act of 1965 Section 6(f).

5.4.1 Summary of Impacts

As described in Section 4.5, the study area used for this analysis is the same as the noise study area, which encompasses the existing and future DNL 65 noise contours. No potential DOT Section 4(f) or Land and Water Conservation Fund (LWCF) Section 6(f) properties are present within this study area. No property would be acquired as part of any alternative under consideration and the 65 DNL noise contour would remain entirely within the Airport property for all alternatives. Therefore, no significant direct or indirect impacts to potential Section 4(f) or Section 6(f) resources were identified and no mitigation measures are necessary.

5.4.2 Regulatory Setting, Threshold of Significance, and Methodology

This section provides a summary of the applicable regulations applying to analysis of potential Section 4(f) or Section 6(f) resources and the methodology used in this analysis.

5.4.2.1 Regulatory Setting

Section 4(f) of the DOT Act of 1966 provides for the protection of certain publicly owned resources. DOT Section 4(f) resources include public parks; recreational areas; wildlife and waterfowl refuges of federal, state, or local significance; and historic sites of federal, state, or local significance. FAA follows the procedural requirements for Section 4(f) provided in Order DOT 5610.1C, Attachment 2, paragraph 4. In addition, FAA uses relevant sections of the Federal Highway Administration and Urban Mass Transportation Administration's guidance defining Constructive Use under 23 CFR 771.135 (56 FR 13269, April 1, 1991).

The Land and Water Conservation Fund Act of 1965 (Public Law 88-578), 16 USC 601-80 (f)(3), commonly known as LAWCON Section 6(f), requires that:

No property acquired or developed with assistance under this section, shall, without the approval of the Secretary (of the Department of the Interior) be converted to other than public outdoor recreational uses. The Secretary shall approve such conversion only if he finds it to be in accord with the existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonable equivalent usefulness and location.

5.4.2.2 Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 6.3 states that a significant Section 4(f) impact would occur:

When the proposed action either involves more than a minimal physical use of a section 4(f) property or is deemed a "constructive use" substantially impairing the 4(f) property, and

mitigation measures do not eliminate or reduce the effects of the use below the threshold of significance.

5.4.2.3 Methodology

Current and planned potential Section 4(f) and Section 6 (f) resources were identified through review of City of Hillsboro and Washington County park plans and maps of federal, state, and local refuges and historic sites. Section 5.3, Historic Properties, documents the investigation of historic and archaeological sites in the Airport area that could represent Section 4(f) resources.

Direct Impacts

Direct impacts would result from acquisition and use of eligible Section 4(f) or Section 6 (f) resources. Direct impacts were identified by determining if Section 4(f) or Section 6(f) resources were located within the area to be acquired for the alternatives under consideration.

Constructive Use

Constructive, or indirect, use would result from noise, air pollution, water quality, or surface transportation effects that substantially diminished the features or attributes of the resource. For instance, an adverse constructive noise impact on a 4(f) resource would occur if the uses within the resource were no longer compatible with noise levels. FAA land use compatibility guidelines (see Table 5.2-1) identify incompatible noise impacts on most urban recreation resources as noise levels above day-night average sound level (DNL) 75, unless the resource contains a receptor of unusual noise sensitivity, such as a nature exhibit or outdoor amphitheater, which require a lower level of noise to be compatible. Constructive uses were assessed by comparing the noise contours provided in Section 5.1, Noise, with the locations of the potential Section 4(f) resources to determine if the projected noise levels were incompatible with the land use. Other potential constructive uses were evaluated based on the impact analysis documented in Sections 5.3, Historical, Architectural, Archaeological, and Cultural Resources; 5.5, Socioeconomic Impacts, Environmental Justice and Children's Environmental Health and Safety Risks; 5.7, Water Quality; and 5.8, Air Quality.

5.4.3 Environmental Impacts of Alternatives

This section describes the potential impacts of Alternatives 2 and 3 compared to the No Action Alternative and analyzes whether these impacts would result in any adverse impacts on potential Section 4(f) or Section 6(f) resources.

5.4.3.1 Alternative 1 - No Action

Under Alternative 1, no property would be acquired and no direct or indirect effects would occur to Section 4(f) or Section 6(f) resources compared to existing conditions. As the baseline against which impacts are assessed, Alternative 1 would not generate noise, air quality, water quality, or surface transportation impacts and thus would not result in the constructive use of Section 4(f) or Section 6(f) resources (see Exhibit 5.4-1).


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5.4.3.2 Alternative 2 – Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts on Section 4(f) or Section 6(f) associated with Alternative 2 during construction and operation. No significant impacts on Section 4(f) or Section 6(f) resources were identified for Alternative 2.

Construction Impacts

Construction activities would occur entirely on Airport property and, as noted in Sections 5.1, Noise, 5.3, Historical, Architectural, Archaeological, and Cultural Resources 5.5, Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks, 5.7, Air Quality and 5.8, Water Quality would not directly or indirectly affect noise, historic resources, surface transportation, water quality or air quality. Construction of this alternative would not, therefore, affect any Section 4(f) or Section 6(f) resources.

Operational Impacts

Alternative 2 would not involve acquisition of any property and would not, therefore, have a direct impact on Section 4(f) or Section 6(f) resources. In addition, the DNL 65 dB noise contour associated with this alternative would be entirely within Port property and would not indirectly affect any potential Section 4(f) or Section 6(f) resources (see Exhibit 5.4-1). The analyses documented in Sections 5.3, 5.5, 5.7, and 5.8 determined that operation of this alternative would not significantly affect historic resources, surface transportation, water quality, or air quality. Implementation of this alternative would not, therefore, result in the constructive use of Section 4(f) or Section 6 (f) resources.

5.4.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on Section 4(f) or Section 6(f) associated with Alternative 3 during construction and operation. No significant impacts on Section 4(f) or Section 6(f) resources were identified for Alternative 3.

Construction Impacts

The construction impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

Operational Impacts

The operational impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

5.4.4 Mitigation and Measures to Avoid and Minimize Impacts

No impacts to potential Section 4(f) or Section 6(f) resources were identified; therefore no mitigation is necessary.

5.5 Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks

This section addresses the socioeconomic impacts, impacts on minority and low-income populations, and children's environmental health and safety risks of the No Action Alternative and Alternatives 2 and 3 for the HIO Parallel Runway 12L/30R Project. As described in Section 4.6, the study area for these analyses included the Census Tract Block Groups within approximately one-half mile of the Airport property boundary.

5.5.1 Summary of Impacts

No significant adverse socioeconomic impacts or risks to children's health and safety are anticipated due to construction and operation of the alternatives under consideration. None of the alternatives would result in the relocation of any residences or businesses; the alternatives would not divide or disrupt communities in the surrounding area, nor would they change surface transportation facilities or traffic volumes. None of the alternatives would cause significant noise levels to extend beyond the Airport boundaries. The alternatives would not therefore generate disproportionate effects on children's environmental health risks and safety risks. The analyses documented in this EA determined that construction and operation of these alternatives would not result in adverse impacts on environmental resources that could lead to disproportionately high and adverse impacts on minority and/or low-income populations as a result of any the alternatives.

5.5.2 Socioeconomic Impacts

Consistent with FAA Order 1050.1E, Change 1, Appendix A.16, this analysis addresses the socioeconomic impacts of the No Action Alternative and Alternatives 2 and 3 for the HIO Parallel Runway Project 12L/30R. Socioeconomic impacts analyzed include any potential relocation of residences or businesses; the division or disruption of established communities; and any changes to surface transportation patterns.

5.5.2.1 Regulatory Setting, Threshold of Significance, and Methodology

The following subsections discuss the current regulations addressing socioeconomic impacts, the thresholds used to assess the significance of socioeconomic impacts, and the methodology used to assess socioeconomic impacts.

Applicable Regulations and Standards

The following regulations and guidance were considered in the socioeconomic analysis:

- Council on Environmental Quality (CEQ) Regulations Implementing NEPA (40 CFR Section 1500 *et seq.*)
- Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (42 USC Section 4601, *et seq.*) (PL 91-646 amended by the Surface Transportation and Uniform Relocation Act Amendments of 1987, Title IV of PL 100-17, and PL 105-117) and 49 CFR Part 24 (Implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970)

Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 16.3a sets forth the following thresholds of significance for socioeconomic issues:

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 roads serving the airport and its surrounding communities.

A substantial loss in community tax base.

Methodology and Assumptions

Socioeconomic impacts were assessed following the guidance in FAA Order 1050.1E, Change 1, Appendix A, Section 16. Secondary (induced) socioeconomic impacts are discussed in Section 5.6. Existing socioeconomic conditions are discussed in Section 4.6.

The socioeconomic analysis included a demographic analysis of the study area, as defined in Section 4.6, and the larger geographic area of Washington County to determine population characteristics and examining the project components associated with Alternatives 2 and 3 to determine if operation or construction of the project alternatives would require the relocation of residences or businesses, result in the division or disruption of established communities, and result in any changes to off-airport surface transportation patterns. Because operations levels would not change under Alternative 2 or 3 compared with Alternative 1, no change in operational surface traffic would occur and no further analysis was conducted. Analysis of potential construction traffic effects evaluated the number of truck trips required for construction, based upon information used to calculate potential construction emissions, of the runway, taxiway, and helipad associated with Alternatives 2 and 3, in comparison with the existing traffic levels on approved haul routes (Exhibit 5.5-1).

5.5.2.2 Environmental Impacts of Alternatives

This section describes the potential impacts of the alternatives under consideration with respect to socioeconomic impacts. In order to determine whether there would be socioeconomic impacts, consideration was given to whether there would be significant impacts associated with air quality, water quality, noise, hazardous materials, or traffic.

Alternative 1 - No Action

Alternative 1 would not require acquisitions or additional physical development. This alternative would also maintain the current configuration and operation of runways at HIO. There would be no decrease in the community tax base. No communities would be divided or disrupted. Although aircraft and vehicular traffic levels would continue to increase as forecast activity levels increase, no established thresholds of significance would be exceeded.



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Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the environmental effects associated with Alternative 2 compared to Alternative 1, the No Action Alternative during construction and operation. No significant socioeconomic impacts were identified for Alternative 2.

Construction Impacts

Construction of Alternative 2 would be completed in phases with improvements to the runway occurring first, in 2010 and 2011, followed by relocation of the Charlie Helipad, planned for construction in 2014. Construction effects are temporary and would end when construction activities have been completed. The expected construction activities would not require any relocations or the division or disruption of communities. There would be short-term economic benefits related to construction employment; however, this increase in employment would not result in any permanent changes in the population in the HIO area.

Construction activities would result in some additional traffic associated with truck trips, which in most cases would be four or less trucks per hour. For a few weeks during peak construction periods, truck traffic could reach 21 trucks per hour. Trucks would access the project site using designated Washington County truck routes, as required by the contract specifications (see Exhibit 5.5-1). The routes most likely to experience construction are Brookwood Parkway/Shute Road to the east of the Airport, and Evergreen Road to the north. These roads are both 4-lane arterials in the vicinity of HIO and would therefore have capacities of approximately 3,800 vehicles per hour. At present, these roadways accommodate traffic counts of 28,216 and 18,790, respectively (Washington County, 2008). Assuming that the peak hour traffic represents 10 percent of the daily traffic, peak hour traffic on these road segments would be 2,822 and 1,879. The peak hour volume/capacity (V/C) ratio for Brookwood Parkway/Shute Road is therefore about 0.74, while the V/C ratio for Evergreen Road is about 0.49.

Portland Metro has established roadway level of service (LOS) designations based on the Transportation Research Board Highway Capacity Manual.¹ The Hillsboro Comprehensive Plan² establishes a transportation goal of maintaining LOS of D or better on area roads. According to Portland Metro guidelines, LOS D represents a V/C ratio of 0.80 to 0.89. Assuming that all construction traffic during the peak months used one or the other of these roads, peak-hour traffic on either would increase by approximately 1 percent, which would not degrade their current LOS. For either road, the resulting LOS would be C or better, and would not represent a significant impact.

Operational Impacts

The project would occur on Hillsboro Airport property that is owned by the Port of Portland. Proposed improvements would not extend beyond the existing HIO boundaries, and therefore no relocations of any residences or businesses would be required. In addition, no communities would be divided or disrupted. No communities would be disrupted and no businesses would be relocated or negatively affected; accordingly, there would be no decrease in the community tax base.

¹ Portland Metro, Evaluating Traffic Congestion, 2001

² City of Hillsboro Comprehensive Plan; Section 13, Transportation; III, Policy, (D) Performance

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the effects associated with Alternative 3 compared to the No Action Alternative during construction and operation. No significant socioeconomic impacts were identified for Alternative 3.

Construction Impacts

The construction impacts associated with Alternative 3 would be the same as those discussed for Alternative 2 above.

Operational Impacts

The operational impacts associated with Alternative 3 would be the same as those discussed for Alternative 2 above.

5.5.2.3 Mitigation and Measures to Avoid and Minimize Impacts

Since Alternatives 2 and 3 would not result in any negative impacts, no mitigation related to socioeconomic effects is required.

5.5.3 Environmental Justice

Consistent with FAA Order 1050.1E, Change 1, Appendix A, Section 5.16, this analysis addresses whether the No Action Alternative or Alternatives 2 or 3 would result in any disproportionately high and adverse impacts on minority and/or low-income populations.

5.5.3.1 Regulatory Setting, Methodology, and Thresholds of Significance

The following subsections discuss the regulations addressing environmental justice impacts, the methodology used to assess environmental justice impacts, and the thresholds used to assess significant impacts. FAA Order 1050.1E, Change 1, Appendix A, Section 16.2a states:

The Presidential Memorandum that accompanied Executive Order 12898 encourages the consideration of environmental justice impacts in EAs, especially to determine whether a disproportionately high and adverse impact may occur. Although such an analysis is not required in an EA, it may be helpful in determining whether there is a potentially significant impact. ...where there is a potentially significant impact as part of its EIS process, the FAA must provide for meaningful public involvement by minority and low-income populations. Additionally, FAA must conduct [an] analysis, including appropriate demographic analysis of the potential effects, to identify and address potential impacts on these populations that may be disproportionately high and adverse.

Applicable Regulations and Standards

The following regulations and guidance were considered in the environmental justice analysis:

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 FR 7629, February 11, 1994)
- U.S. Department of Transportation (DOT) Order 5610.2, Environmental Justice in Minority and Low-Income Populations, (62 FR 72, April 15, 1997)
- Environmental Justice: Guidance Under the National Environmental Policy Act (CEQ, 1997)
- *Final Guidance for Consideration of Environmental Justice in Clean Air Act 309 Reviews,* (EPA, 1999)

Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 16.3a states that "Disproportionately high and adverse human health or environmental effects on minority and low-income populations may represent a significant impact." The US Department of Transportation defines these terms as follows:

Disproportionately high and adverse impact on minority and low-income populations. A disproportionately high and adverse impact on minority and low-income populations is an adverse impact that:

(1) is predominately borne by a minority population and/or a low-income population, or

(2) will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse impact that will be suffered by the non-minority population and/or non-low-income population.

(DOT Order 5610.2, § Appendix 1(g))

Low income. A person whose median household income is at or below the U.S. Department of Health and Human Services poverty guidelines for that size of household (DOT Order 5610.2, § Appendix 1(b)).

Low-income population. This population includes any readily identifiable group of lowincome persons who live in geographic proximity and – if circumstances warrant – geographically dispersed and/or transient persons (i.e., migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy, or activity (DOT Order 5610.2, § Appendix 1(d)).

Minority. A minority person is one who meets any of the following criteria (DOT Order 5610.2, § Appendix 1(c)):

- Black (a person having origins in any of the black racial groups of Africa)
- Hispanic (a person of Mexican, Puerto Rican, Cuban, Central America, South American, or the Spanish culture or origin, regardless of race)
- Asian (a person having origins in any of the original people of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands)
- American Indian or Alaskan Native (a person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition)

Minority population. Any readily identifiable groups of minority persons who live in geographic proximity and – if circumstances warrant – geographically dispersed and/or transient persons (i.e., migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy, or activity (DOT Order 5610.2, § Appendix 1(e)).

Methodology and Assumptions

Existing low-income and minority populations are discussed in Section 4.6. Exhibits 5.5-2 and 5.5-3 show individual U.S. Census Block Groups entirely or partially contained within the study area, as defined in Section 4.6 and the percentage of minority and low-income individuals within the population residing within each Block Group.



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The environmental consequences of Alternatives 2 and 3 were evaluated to determine if either proposed project alternative would cause any disproportionately high and adverse impacts on minority and/or low-income populations.

This analysis was performed in accordance with EO 12898 and DOT Order 5610.2 and was prepared using the most recent guidance document from the FAA, Order 1050.1E, Change 1, *Environmental Impacts: Policies & Procedures* (FAA, 2004); and the best available project-specific and demographic data. Demographic data used included data from the 2000 U.S. Census for Block Groups entirely or partially contained within the study area. In addition, since U.S. Census data are more than 9 years old, the analysis included a review of elementary school demographics to identify recent changes in study area demographics. Elementary school data used was from the Hillsboro School District, since the attendance boundaries are the most similar to the Census Tract Block Groups used for the demographic analysis. School data includes minority information similar to the U.S. Census and to assess low-income populations, the number of students who are eligible for the free lunch program (comprised of children from families with incomes at or below 130 percent of the poverty level) was considered.

Impacts on minority and low-income populations were assessed through review of demographics, public outreach information, and the potential environmental impacts discussed in other sections of this EA and their location in relation to minority and low-income populations. This analysis determined whether the project would result in disproportionately high and adverse impacts on minority and/or low-income populations.

As part of the public involvement effort for the project, a meeting with the public and agencies was held on September 11, 2008, to provide information on the project and allow the public to comment. More than 50 people attended the meeting and the majority of the comments related to support for the project and issues regarding noise. The public was notified of the meeting through advertisements in local papers including the *Hillsboro Argus* and *The Oregonian*. Other public involvement efforts have included banners, a briefing packet, information on the Hillsboro Airport page of the Port of Portland website, and announcements through the City of Hillsboro's "Stay Connected" e-publication posted on their website and distributed to people on the City's mailing list.

5.5.3.2 Environmental Impacts of Alternatives

This section describes the alternative under consideration with respect to environmental justice. To determine whether there would be any disproportionate impacts to minority and/or low income populations, consideration was given to whether there would be any disruption of minority and/or low-income communities and whether there would be significant impacts associated with air quality, water quality, noise, hazardous materials, or traffic.

Alternative 1 - No Action

Alternative 1 would not require expansion of the Airport or relocation of any residential or commercial development. No minority or low-income populations would be disrupted. Under the No Action Alternative, operations at HIO would continue to increase and there would be increased congestion and delay compared to existing conditions. As discussed in Section 5.7, Air Quality, increased congestion would result in increased air emissions, but would not exceed recognized thresholds of significance. Similarly, forecast growth in aircraft activity would increase noise levels compared to existing conditions, but significant levels of aircraft noise

would be limited to the Airport. No minority or low-income populations would be exposed to significant levels of noise or air pollutants.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the environmental effects of Alternative 2 compared to the No Action Alternative during construction and operation. No significant environmental justice impacts were identified for Alternative 2.

Construction Impacts

Construction activities associated with Alternative 2 would result in temporary increases in noise and dust associated with construction activities. All construction would occur within Airport boundaries and mitigation measures would be implemented to minimize impacts. In addition construction activity would occur in the northeast quadrant of the Airport. As noted earlier, the highest proportion of minority and low-income populations are located beyond the southwest corner of the Airport. Construction would not result in any disproportionately high and adverse impacts on minority or low-income populations. As described in Section 5.5.2.2, offsite construction traffic would follow County-designated construction traffic routes and would not generate significant changes in noise levels along those routes.

Operational Impacts

Alternative 2 would be developed entirely on property that is owned by the Port of Portland and does not require the acquisition of any residential properties, minority-owned businesses, or any business that provides unique services to minority or low-income populations. The analyses documented in Section 5.1, Noise; Section 5.3, Historical, Architectural, Archeological, and Cultural Resources; Section 5.7, Air Quality; Section 5.8, Water Quality; and Section 5.12, Hazardous Materials, Pollution Prevention, and Solid Waste, show that Alternative 2 would not result in significant negative effects to human health: air quality is expected to improve, and stormwater runoff would be treated to meet applicable water quality standards prior to release into local water bodies. There are also no adverse impacts on historic and cultural resources. These analyses determined that there would be no significant impacts on any populations including minority and low-income populations.

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts associated with Alternative 3 compared to the No Action Alternative during construction and operation. No significant environmental justice impacts were identified for Alternative 3.

Construction Impacts

The construction impacts associated with Alternative 3 would be the same as those discussed for Alternative 2 above.

Operational Impacts

The operational impacts associated with Alternative 3 would be the same as those discussed for Alternative 2 above.

5.5.3.3 Mitigation and Measures to Avoid and Minimize Impacts

Since neither of the build alternatives would result in any disproportionately high and adverse impacts on minority or low-income populations, no mitigation measures specific to minority or low-income populations are proposed or required.

5.5.4 Children's Environmental Health and Safety Risks

Consistent with FAA Order 1050.1E, Change 1, Appendix A, Section 16, this analysis addresses whether the No Action Alternative or Alternatives 2 or 3 would result in any disproportionately impacts on children's environmental health and safety.

5.5.4.1 Regulatory Setting, Methodology, and Thresholds of Significance

The following subsections discuss the current regulations addressing children's environmental health and safety risks, the thresholds used to assess the significance of children's environmental health and safety impacts, and the methodology used to assess children's environmental health and safety risks.

Applicable Regulations and Standards

Guidance regarding analysis of children's environmental health and safety risk is provided by Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks.

Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 16.3a sets forth the following thresholds of significance for children's environmental health and safety risk issues:

An action causing disproportionate health and safety risks to children may indicate a significant impact.

Methodology and Assumptions

For children's environmental health risks and safety risks, the analysis consisted of conducting a demographic analysis to identify the population under the age of 18 in the study, reviewing the proposed project locations in relation to any schools (public and private) and child care facilities, and qualitatively assessing whether any of the alternatives would result in disproportionate children's environmental health and safety risks. The qualitative assessment was based upon a review of the other environmental documentation prepared for the project and included review of Section 5.1, Noise; Section 5.7, Air Quality; Section 5.8, Water Quality; and Section 5.12, Hazardous Materials, Pollution Prevention, and Solid Waste, because these can have the greatest impact on children's environmental health and safety. The impacts identified in these sections was used to determine if there would be any impacts that could adversely affect children's environmental health and safety and the mitigation measures that would be included to minimize any adverse effects.

5.5.4.2 Environmental Impacts of Alternatives

This section describes the potential impacts of the alternatives under consideration with respect to children's environmental health and safety risks. To determine whether there would be any environmental health and safety risks, consideration was given to whether there would be any significant impacts associated with air quality, water quality, noise, hazardous materials, or traffic.

Alternative 1 - No Action

As discussed in Section 5.7.3.1, aircraft emissions are expected to increase under the No Action Alternative relative to existing conditions due to growth in activity and the delay associated with that higher level of activity; however, any increase in air pollutant emissions would remain well below the threshold levels and would not pose any risk to children in the surrounding area. As discussed in Section 5.1, Noise, Section; 5.8, Water Quality; and Section 5.12, Hazardous Materials, Pollution Prevention, and Solid Waste, the No Action Alternative would not result in any negative impacts related to noise, water quality, or hazardous materials related to children's environmental health and safety. While air quality emissions are expected to increase under the No Action Alternative, the increase would not exceed any threshold levels.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the environmental effects associated with Alternative 2 compared to the No Action Alternative during construction and operation. No significant impacts on children's environmental health and safety were identified for Alternative 2.

Construction Impacts

Construction activities would result in minor and temporary increases in air pollutant emissions compared to the No Action Alternative; however, construction emissions would remain well below the threshold levels that would require detailed air quality analysis and would not pose any risk to children's environmental health and safety. In addition, there would be temporary increases in noise levels; however, these impacts are not significant and would not result in any environmental health and safety risks to children.

Operational Impacts

The analyses documented in Section 5.1, Noise, shows that significant noise levels would remain on-airport and would not adversely affect children's health. Sections 5.7, Air Quality; 5.8, Water Resources; and 5.12, Hazardous Materials, Pollution Prevention, and Solid Waste, show that Alternative 2 would not affect products or substances (i.e., water, soil, and food) that a child is likely to ingest, use, be exposed to, or come into contact with. In fact, air quality is expected to improve and stormwater runoff would be treated prior to release into local water bodies. Therefore, there would be no significant impact on children's environmental health risks and safety risks resulting from the operation of Alternative 2.

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the effects associated with Alternative 3 during construction and operation. No significant impacts on children's environmental health and safety were identified for Alternative 3.

Construction Impacts

The construction impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

Operational Impacts

The operation impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

5.5.4.3 Mitigation and Measures to Avoid and Minimize Impacts

Since Alternatives 2 and 3 would not result in any significant negative impacts, no mitigation related to children's environmental health and safety is required.

5.6 Secondary (Induced) Impacts

Consistent with FAA Order 1050.1E, Change 1, Appendix A, Section 15, this analysis addresses the secondary (induced) impacts of Alternatives 2 and 3 compared to the No Action Alternative. The analysis also compares the effects of Alternative 1, No Action, with existing conditions. In some cases, impacts associated with land use, noise, and direct social impacts can lead to induced socioeconomic impacts. The secondary impacts analyzed in this section include shifts in patterns of population movement and growth, increased public service demands, and changes in business and economic activities.

5.6.1 Summary of Impacts

No significant adverse secondary impacts would occur as a result of construction or operation of Alternatives 1, 2, or 3. None of the alternatives would result in land use, noise, or direct social impacts that could lead to shifts in patterns of population movement and growth, increased demand for public services, or changes in business and economic activities.

5.6.2 Regulatory Setting, Threshold of Significance, and Methodology

The following subsections discuss the regulations addressing secondary impacts, the methodology used to assess socioeconomic impacts, and the thresholds used to assess the significance of socioeconomic impacts.

5.6.2.1 Applicable Regulations and Standards

Guidance for assessing secondary impacts is based on Council on Environmental Quality Regulations Implementing NEPA (40 CFR Section 1500 *et seq.*). This guidance identifies secondary impacts as induced changes in patterns of land use, population density or growth rate, and related effects on natural systems.

5.6.2.2 Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 15, does not identify a threshold of significance for secondary impacts, but considers that induced impacts will normally not be significant, except where there are also significant impacts in other disciplines, especially noise, land use, or direct social impacts.

5.6.2.3 Methodology and Assumptions

The analysis consisted of determining a baseline condition for those affected; identifying effects related to changes in land use, noise levels, and direct social impacts; setting up the geographic scope and time frame for the analysis; and identifying and characterizing project-induced effects and affected people, neighborhoods, businesses, services, and other economic activities.

5.6.3 Environmental Impacts of Alternatives

This section describes the potential impacts of Alternative 2 and Alternative 3 compared to Alternative 1, the No Action Alternative, and analyzes whether these impacts would result in any secondary impacts. In order to determine whether there would be any secondary impacts, consideration was given to whether there would be any significant impacts associated with land use, noise, or social disciplines.

5.6.3.1 Alternative 1 - No Action

The No Action Alternative would not entail acquisitions or additional physical development. Although aviation activity would continue to increase compared to existing conditions, the No Action Alternative would not alter land use or transportation patterns and would not exceed thresholds of significance for noise, air quality, or water quality. In the absence of physical development or significant environmental impacts, this alternative would not cause shifts in the existing patterns of population growth, public service demands, or business and economic activities, and therefore it would not lead to secondary impacts.

5.6.3.2 Alternative 2 - Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts associated with Alternative 2 during construction and operation. No significant secondary (induced) impacts were identified for Alternative 2.

Construction Impacts

As noted in Section 5.5, construction of Alternative 2 would be completed in phases with improvements to the runway occurring first, in 2010 and 2011, followed by relocation of the Charlie Helipad, planned for 2014. Construction effects would end when construction activities have been completed. Construction activities would not require any relocations or the division or disruption of communities. There would be short-term economic benefits related to construction employment; however, this temporary increase in employment would not result in any permanent changes in the population in the HIO area. Construction-related truck traffic and employee trips would not affect surface traffic patterns because contractors would be required to use County-designated haul routes that already have high traffic volumes. Construction effects would end when construction activities have been completed and would not result in any land use, noise, or direct social effects; therefore, there would not be any secondary impacts.

Operational Impacts

The proposed Runway 12L/30R and Charlie Helipad Option A would be located on property that is currently owned by the Port of Portland and adjacent to the existing airfield. Proposed improvements would not extend beyond the existing HIO boundaries, and as a result, would not affect land use or surface transportation. As described in Section 3.2.2, Alternative 2 would not lead to increased aviation activity compared to the No Action Alternative. As described in Sections 5.1, Noise and 5.8, Air Quality, operation of the new facilities would not cause significant impacts to noise or air quality. In the absence of induced off-airport development, increased levels of aviation activity, or significant environmental impacts, this alternative would not lead to secondary impacts with respect to shifts in patterns of population movement and growth, public service demands, or changes in business and economic activities.

5.6.3.3 Alternative 3 - Runway 12L/30R with Charlie Helipad Option B

This section describes the secondary impacts associated with Alternative 3 during construction and operation. No significant secondary (induced) impacts were identified for Alternative 3.

Construction Impacts

The construction impacts from Alternative 3 would be the same as Alternative 2.

Operational Impacts

The operational impacts from Alternative 3 would be the same as Alternative 2.

5.6.4 Mitigation and Measures to Avoid and Minimize Impacts

Construction and operation of Alternative 2 or Alternative 3 would not result in any negative impacts and no mitigation related to secondary conditions is required.

5.7 Air Quality

This section describes projected air quality impacts of the alternatives retained for detailed consideration at HIO. Following a summary of air quality impacts, this section reviews applicable regulations, describes the methodologies used to estimate operational and construction emissions, reviews existing conditions, and compares the effects of the alternatives under consideration.

5.7.1 Summary of Impacts

Construction of either Alternative 2 or Alternative 3 would entail construction of the proposed runway, taxiways, and the Charlie helipad. All of these alternatives would temporarily increase air emissions Table 5.7-1 summarizes the estimated construction emissions of Alternatives 2 and 3 in 2010, the projected peak construction year. The construction-related emissions of Alternative 1 would be less than those shown in the table. Once constructed, the build alternatives would reduce airfield congestion and aircraft delay compared to the No Action Alternative, resulting in long-term, ongoing emissions reductions as listed in Table 5.7-2.

TABLE 5.7-1

Peak Project-Related Construction Year Emissions - 2010 (tons per year)

	Construction Emissions (all sources)						
	СО	VOCs	NOx	SOx	PM ₁₀ /PM _{2.5}		
Total Emissions	6.1	0.4	5.2	0.5	4.0		

Notes: CO = carbon monoxide; VOCs = volatile organic compounds; NOx = nitrogen oxides; SOx = sulfur oxides; PM_{10} = particulate matter less than 10 micrometers in aerodynamic diameter; $PM_{2.5}$ = particulate matter less than 2.5 micrometers in aerodynamic diameter; Pb = lead

Source: CH2M HILL analysis, December 2008.

TABLE 5.7-2

Comparative (Operational	Emissions	Inventories	Once	Construction	is Co	ompleted ((tons/y	ear)
---------------	-------------	-----------	-------------	------	--------------	-------	------------	---------	------

Scenario	СО	VOCs	NOx	SOx	PM ₁₀	PM _{2.5}	Pb
Existing (2007)	1,116.0	35.5	20.7	2.9	0.4	0.4	0.7
2012 Alternative 1: No Action	1,436.0	48.7	32.3	4.3	0.6	0.6	0.9
2012 Alternatives 2 & 3	1,417.0	46.7	32.0	4.1	0.6	0.6	0.9
2012 Project-related changes	-19.0	-2.0	-0.3	-0.2	0.0	0.0	0.0
2015 Alternative 1: No Action	1,512.0	53.2	33.2	4.6	0.6	0.6	1.0
2015 Alternatives 2 & 3	1,479.0	47.8	32.7	4.4	0.6	0.6	1.0
2015 Project-related changes	-33.0	-5.4	-0.5	-0.2	0.0	0.0	0.0

Notes: CO = carbon monoxide; VOCs = volatile organic compounds; NOx = nitrogen oxides; SOx = sulfur oxides; $PM_{10} = particulate matter less than 10 micrometers in aerodynamic diameter; <math>PM_{2.5} = particulate matter less than 2.5 micrometers in aerodynamic diameter; Pb = lead. Existing (2007) emissions from Appendix C.4.$

Source: CH2M HILL analysis, December 2008.

As shown in Section 5.7.3.4, the total emissions of either of the project alternatives under consideration would be well below the *de minimis* level. These emissions also represent less than 1/10 of one percent of regional emissions,¹ and would not be regionally significant. By regulation, a General Conformity determination is not required.

5.7.2 Regulatory Setting, Threshold of Significance, and Methodology

This section summarizes applicable air quality regulations and requirements, the existing air quality setting, and the methodology used to compute airport-related emissions. Appendix C.4, Air Quality, provides additional detail.

5.7.2.1 Applicable Regulations and Standards

Hillsboro Airport is subject to federal, state, and local air quality regulations, which are enforced primarily by the Oregon Department of Environmental Quality (DEQ). As noted in Section 4.3.1, HIO is located in the Portland-Vancouver Air Quality Maintenance Area (AQMA), which is in attainment for all pollutants but is subject to a maintenance plan developed to ensure continued compliance with the CO standard.

Clean Air Act

Pursuant to the Clean Air Act (CAA) as amended, the EPA has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM) for both PM₁₀ and PM_{2.5}, and sulfur dioxide (SO₂). These NAAQS have been established to protect human health, public welfare, and the environment. The DEQ has established similar health-based standards, although these are more restrictive in some cases than EPA standards. The NAAQS and Oregon standards are presented in Table 5.7-3. Volatile organic compounds (VOCs) and nitrogen oxides (NOx) are precursor pollutants for the formation of ozone and are therefore included in emissions inventories developed for implementation plans to achieve or maintain NAAQS.

State Permits

The State of Oregon requires indirect source review permits for facilities that indirectly cause or may cause mobile source activity resulting in emissions of CO. HIO does not exceed the thresholds requiring State permits.

FAA Responsibilities

The FAA is responsible for ensuring that federal actions at airports located in federally designated nonattainment and maintenance areas conform to air agency plans. As noted above, the General Conformity regulation requires a conformity determination for federal actions that would exceed established *de minimis* levels, or which would be regionally significant. The FAA is also responsible for ensuring that federal actions do not cause emissions at airports to exceed NAAQS.

¹ Portland Area Carbon Monoxide Maintenance Plan, 2004.

National Standards^a Oregon Standards Primary ^b Secondary Pollutant **Averaging Time** Ozone 8-hour 0.075 ppm 0.075 ppm 0.075 ppm revoked ^d revoked ^d 1-hour revoked^d Carbon monoxide 8-hour 9 ppm 9.0 ppm 1-hour 35 ppm ---35 ppm 0.053 ppm Nitrogen dioxide annual arithmetic mean 0.053 ppm 0.053 ppm Sulfur dioxide annual arithmetic mean 0.03 ppm 0.02 ppm 24-hour 0.14 ppm 0.10 ppm 3-hour 0.5 ppm 0.050 ppm revoked e revoked^e revoked^e **PM**₁₀ annual arithmetic mean $150 \,\mu g/m^3$ $150 \,\mu g/m^3$ $150 \,\mu g/m^3$ 24-hour $15 \,\mu a/m^3$ $15 \,\mu a/m^3$ PM_{2.5} annual arithmetic mean $12 \,\mu g/m^3$ 24-hour $35 \mu g/m^3$ $35 \mu g/m^3$ Lead calendar quarter $1.5 \,\mu g/m^3$ $1.5 \,\mu g/m^3$ $1.5 \,\mu g/m^3$

 TABLE 5.7-3

 Ambient Air Quality Standards

^a National standards, other than ozone, particulate matter, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard (effective 60 days after publication in the Federal Register). For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 micrograms per cubic meter (μg/m³) is equal to or less than 1. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

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

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

^d Nonattainment and maintenance areas no longer subject to the 1-hour standard, revoked as of June 15, 2005.

^e As a result of lack of evidence linking health problems to long-term exposure to coarse particulate pollution, EPA revoked the annual PM₁₀ standard in 2006, effective December 17, 2006.

 $\mu g/m^3$ = micrograms per cubic meter

ppm = parts per million (by volume)

Source: 2006 Oregon Air Quality Data Summaries (DEQ, 2007a).

State Implementation Plan

States are responsible for designating areas that are attainment, nonattainment, or maintenance for each of the criteria pollutants. Each state is required to develop a State Implementation Plan (SIP) to achieve or maintain attainment of the NAAQS within the timeframes set under the CAA. The SIP is a comprehensive plan for the airshed that provides for implementation, maintenance, and enforcement of the measures to bring the area into attainment of NAAQS.

Table 5.7-4 shows the emission projections used to demonstrate that the Portland Air Quality Maintenance Area is projected to maintain attainment with the NAAQS for CO. The Portland Area Carbon Monoxide Maintenance Plan forecasts CO emissions for the demonstration years of 2005, 2010, and 2017.

State of Oregon CO Emissions Inventory Projections					
Analysis Year	Annual CO Emissions (tons/year)				
2005	497,156				
2010	486,359				
2017	540,670				

 TABLE 5.7-4

 State of Oregon CO Emissions Inventory Projections

Source: Portland Area Carbon Monoxide Maintenance Plan, Oregon Department of Environmental Quality, December 10, 2004, Table 8.

General Conformity

As noted above, a general conformity determination is required for a federal action proposed in a nonattainment or maintenance area if the project's total direct and indirect emissions would equal or exceed the annual *de minimis* emission levels in Title 40 Code of Federal Regulations (CFR) Part 93 Subpart 153, or if the project would be regionally significant (if the project emissions represent 10 percent or more of total regional emissions). Because the Portland region is a maintenance area for the CO standard, the applicable *de minimis* threshold level is 100 tons per year for CO.

FAA Order 1050.1E, Appendix A, Section 2 defines direct and indirect emissions as follows.

Direct emissions are those that are caused by or initiated by the Federal action and occur at the same time and place as the action. Indirect emissions are those caused by the Federal action, but occur later in time and/or may be removed in distance from the action. Temporary construction emissions must be considered in determining whether emission threshold levels are exceeded. (See EPA General Conformity Questions and Answers, dated November 1994.)

The Order further defines direct and indirect emissions as follows.

In addition, the General Conformity Rule adopted the exclusive definition of indirect emissions, which excludes emissions that may be attributable to the Federal action, but that the FAA has no authority to control. The FAA is responsible for assessing only direct and indirect emissions of criteria pollutants and precursors that are caused by a Federal action, are reasonably foreseeable, and can practicably be controlled by the FAA through its continuing program responsibility. The FAA may compare emissions with and without the proposed Federal action during the year in which emissions are projected to be greatest in determining whether emission threshold levels are exceeded.

NAAQS

The FAA must also determine that the federal action would not exceed the NAAQS for any criteria pollutant for the timeframe used in the NEPA analysis.

5.7.2.2 Thresholds of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 2.3 provides the following guidance. "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." Chapter 1, paragraph 6, e, (5) of the FAA Environmental Desk Reference for Airport Actions provides the following additional guidance on determining significance: (b) When the emissions inventory shows total net emissions are <u>below</u> de minimis *levels*. If total net emissions of the proposed airport action or alternative analyzed are below de minimis thresholds, and is determined not regionally significant, no further air quality analysis is needed. Therefore, the responsible FAA official may conclude the following:

(1) For NEPA purposes, The action and/or alternatives (if alternatives are evaluated) will not cause a significant air quality impact, since it is unlikely the pollutant concentration analyzed would exceed a NAAQS (See FAA Air Quality Handbook, pg. 14, Section 2.1.5)); and/or

(2) For General Conformity purposes. FAA need not conduct additional analysis or make a General Conformity Determination.

5.7.2.3 Methodology and Assumptions

An inventory of airport-related criteria pollutant emissions was prepared to summarize impacts that may occur with and without construction of either of the two project alternatives under consideration. A summary of the methods and assumptions used to estimate air emissions follows. More detailed descriptions of model inputs and assumptions are provided in Appendix C.3, Air Quality.

Emissions from Aircraft Operations

As required by FAA guidance, the evaluation of airport-related emissions was conducted using the most recent version of the FAA's Emissions Dispersion Modeling System (EDMS) Version 5.1 (FAA, 2008). Emissions were estimated for year 2007, 2012, and 2015 based on the activity forecast for the Airport, as described in the Hillsboro Airport Forecast Update and Verification (CH2M HILL, 2008). Neither of the two project alternatives would affect roadway traffic, parking lot activities, or stationary sources as compared to the No Action Alternative. Therefore, emissions from those sources are not evaluated.

As described in Chapter 3, Alternatives, the proposed projects would improve the operational efficiency of the airfield. Alternative 1, No Action, reflects operations assuming that the proposed parallel runway, taxiways, and Charlie Helipad would not be constructed. Alternatives 2 and 3 involve construction of the same runway and taxiway improvements. These two alternatives differ only with respect to the location of the relocated Charlie Helipad. The development of these proposed facilities would reduce the delay experienced by aircraft operating in each of the forecast years.

Aircraft emissions were estimated for each aircraft on a landing and takeoff (LTO) cycle basis. An LTO consists of two operations, a landing and a take-off. A complete LTO cycle includes 4 "modes" of operation: approach, taxi (in and out)/idle, take-off, and climb-out. Many aircraft also perform pilot training activities called touch-and-go cycles (TGOs). TGOs also comprise two operations consisting of the same aircraft modes except that there is no taxi/idle time while the aircraft is on the ground. Aircraft operations below 3,000 feet above ground level (AGL), including all TGO operations, are included in the inventory. The EDMS produces estimates of the fuel burned by each aircraft as it operates in these modes as well as emissions.

The amount of time that each type of aircraft typically spends in each of the modes described above was used in emission calculations. The EDMS calculations assume default

time values included in the EDMS model for the airborne times in mode (approach, take-off, and climb-out). These values are specific to the performance characteristics of each type of aircraft. Without the project (Alternative 1 – No Action), the estimated total taxi in/out times ranged from 10 minutes in 2007 to 12.4 minutes in 2015 (see Chapter 3, Alternatives). Taxi times include the time required to taxi to and from the runways without delays, as well as any delays the aircraft encounters. The increase in taxi times noted above reflects the increasing levels of aircraft delay as demand increases over time. As noted in Chapter 3, Alternatives 2 and 3 would reduce taxi/idle delay. With these alternatives taxi/idle time would range from 10 minutes in 2010 to 9.1 minutes in 2015 for fixed wing aircraft.

The location of the helipad would affect the taxi distances helicopters would taxi to and from the helipad at the start and end of flight operations. The centers of the two helipad sites are within 500 feet of each other, about a 13 percent change in the taxi distance from the Hillsboro Aviation ramp. The location of the Charlie Helipad would not affect the majority of helicopter operations, which occur in the Charlie helicopter pattern, and would have little effect on average helicopter flight times.

Construction Activities

Although the construction of Runway 12L/30R and associated taxiways is planned to commence in 2010 and continue into 2011, construction emissions were estimated assuming that construction would occur within a single calendar year. Construction of the Charlie Helipad was assumed to start after the new runway is commissioned; thus the two construction projects would not overlap. The two alternative potential locations for construction of the Charlie Helipad are very close together and each would require essentially the same level of construction activity. As described in Appendix C-4, air emissions during the construction period for either project would result from the following activities:

- **Construction equipment.** Heavy diesel-powered equipment would be used during site preparation and project construction to perform activities such as clearing, grading, excavating, and paving. The estimated hours of equipment operation are based on conservative historical production rates for the airfield improvements to be constructed. Once the total hours of operation for each piece of equipment were estimated, emission factors from the EPA NONROAD2005 model² are used to estimate the exhaust emissions of criteria pollutants such as CO, NO_X, VOCs, SO_X, PM₁₀, and PM_{2.5}.
- **Material transport.** As described in Appendix C-4, the quantities of materials required for the work were estimated to approximate the cost of the project. Heavy diesel-powered trucks were assumed to haul the materials from offsite suppliers, using haul distances ranging from 15 to 35 miles dependent upon the typical supplier location.

² EPA NONROAD2005 model uses national average emission rates that are based upon fuel type, engine size (horsepower). Port construction specifications require use of ultra low sulfur diesel fuel be used in construction equipment if practicable. Use of ultra low sulfur fuel would reduce emissions of SOx and PM, but does not materially affect emissions of other criteria pollutants.

Emissions factors from the EPA NONROAD2005 Model, based on the national fleet mix,³ are used for on-road vehicles (see Appendix C-4).

- Worker commuting trips. Worker commute emissions are based on 200 employee vehicles traveling 25 miles round-trip for 200 days, and mobile source emission factors from MOBILE6.2.
- **Grading, site preparation, and demolition.** Fugitive PM emissions estimates associated with earth disturbance and demolition are based on the volumes of excavation using emission factors for PM₁₀ from the U.S. Environmental Protection Agency (EPA) *Compilation of Air Pollutant Emission Factors,* Volume 1 (AP-42). Fugitive dust emissions from the construction sites are assumed to be reduced by 50 percent by watering the exposed areas three times a day. Currently, no emission factors are available to calculate the fugitive PM_{2.5} emissions. It is assumed that the PM_{2.5} emissions would be the same as the PM₁₀ emissions.

5.7.3 Environmental Impacts of Alternatives

In accordance with the requirements of NEPA, this section compares the air emissions of the alternatives retained for detailed consideration. The following subsections address conditions in 2012, reflecting the first full year of operations on the proposed parallel runway and associated taxiways, and 2015, reflecting the first full year of operations on the relocated Charlie Helipad. As described in Chapter 3, Section 3.3, all of the alternatives under consideration would accommodate the same volume of aircraft activity each year. As a result, emissions from sources directly related to the number of aircraft operations, such as GSE, vehicles, and stationary sources, would not differ among the three alternatives. By reducing the amount of delay per aircraft operation, the Alternative 2 or 3 would reduce aircraft ground idle emissions compared to the No Action Alternative.

5.7.3.1 Alternative 1 – No Action

The No Action Alternative would not entail acquisitions or additional physical development. This alternative would also maintain the current configuration and operation of runways at HIO. Table 5.7-5 shows that emissions are forecast to increase through the analysis period. CO emissions would increase by about 30 percent above 2007 levels in 2012 and by about 38 percent in 2015. This projected increase in aircraft emissions is due to the forecasted growth in aircraft activity and the resulting increase in aircraft delay at HIO. Consistent with existing conditions, aircraft operations represent the primary source of all criteria pollutants.

³ Spread Sheet For Calculations Of Construction Equipment Emissions for off-highway truck, FAA Dennis Ossenkop, 2002. These rates are higher than those for comparable on-road vehicles in Mobile 6.2.

		Estimated Emissions (tons/year)						
Year	СО	VOCs	NOx	SOx	PM 10	PM _{2.5}	Pb	
Existing (2007)	1,116.0	35.5	20.7	2.9	0.4	0.4	0.7	
2012 ^a	1,395.0	43.8	27.3	4.0	0.3	0.3	0.9	
2015 ^b	1,480.0	48.6	29.4	4.4	0.4	0.4	1.0	

 TABLE 5.7-5

 Alternative 1 (No Action) Aircraft Operational Emissions, Existing, 2012, and 2015

^aEstimates reflect 11.1 total minutes of aircraft taxi/idle time and 277,224 total aircraft operations. ^bEstimates reflect 12.4 total minutes of aircraft taxi/idle time and 288,250 total aircraft operations. Source: CH2M HILL analysis, 2008.

5.7.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts on air quality associated with Alternative 2 during construction and operation. No significant impacts on air quality were identified for Alternative 2.

Construction Emissions

As described in Section 5.7.2.3, the two notable construction projects associated with Alternatives 2 and 3 are the parallel Runway 12L/30R and associated taxiways, and the relocated Charlie Helipad. Construction of the runway and associated taxiways is expected to occur in 2010 and 2011. Construction of the Charlie Helipad is planned for 2014. Construction of the helipad would not commence until the parallel runway is in operation; thus the two construction projects would not overlap.

The emissions estimates shown in Table 5.7-6 reflect the peak construction year for the runway/taxiway project. The helipad construction project planned for 2014 would require much less construction effort and equipment than the runway/taxiway project. A more detailed description of the calculation methodology is provided in Appendix C.3, Air Quality.

These temporary construction emissions represent the only project-related increase in emissions. Given that the total project-related emissions of either Alternative 2 or Alternative 3 would be below the *de minimis* thresholds it is unlikely the pollutant concentration analyzed would exceed a NAAQS. Therefore, construction emissions would not exceed any threshold of significance.

TABLE 5.7-6

|--|

	Construction Emissions (tons/year)					
Source	СО	VOCs	NOx	SOx	PM ₁₀ /PM _{2.5}	
Construction equipment	1.4	0.3	2.7	0.3	0.2	
Material hauling emissions	1.1	0.1	2.5	0.3	0.2	
Fugitive Dust - Site grading and demolition	NA	NA	NA	NA	3.6	
Worker commute emissions	3.6	<0.1	<0.1	<0.1	<0.1	
Total Construction Emissions for 2010	6.1	0.4	5.2	0.5	4.0	

NA = not applicable; PM emissions are the only pollutant from this category. Source: CH2M HILL analysis, 2008.

Operational Emissions

TABLE 5.7-7

Table 5.7-7 shows the aircraft emissions inventories for Alternatives 2 and 3 for 2012 and 2015. Although Alternatives 2 and 3 would experience the same level of aircraft operations as the No Action Alternative, aircraft emissions for both project alternatives would be slightly lower than the emissions estimated for the No Action Alternative because these project alternatives would reduce aircraft delay.

Alternative 2 and Alternative 3, Aircraft Operational Emissions, 2012 and 2015							
	Estimated Emissions (tons/year)						
Source	СО	VOCs	NOx	Sox	PM 10	PM _{2.5}	Pb
2012 ^a	1,376.0	40.7	27.0	3.9	0.3	0.3	0.9
2015 ^b	1,447.0	43.2	28.9	4.2	0.3	0.3	1.0

^a Estimates based on 9.1 total minutes of aircraft taxi/idle time and 277,224 total aircraft

operations. ^b Estimates based on 9.1 total minutes of aircraft taxi/idle time and 288,250 total aircraft operations.

Source: CH2M HILL analysis, 2008.

Once constructed, operation of the proposed project would not increase emissions from other sources because all of the alternatives under consideration would experience the same level of aviation activity. There would be no change in airport related surface traffic or demand for public services or other potential emissions sources.

Table 5.7-7 shows that aircraft operational emissions are forecast to increase through the analysis period. Compared to existing conditions, CO emissions would increase by about 28 percent in 2012 and by about 35 percent in 2015. These increases reflect forecast growth in aircraft activity. Table 5.7-8 compares aircraft emissions of Alternatives 2 and 3 with those of the No Action Alternative, showing that Alternatives 2 and 3 would reduce aircraft operational emissions in the future compared to the No Action Alternative and would not cause significant air quality impacts.

Project-Related Aircraft Operational Emissions – Alternative 2 and 3 Compared to Alternative 1							
	Aircraft Operational Emission Differences (tons/year)						
Source	СО	VOCs	NOx	Sox	PM 10	PM _{2.5}	Pb
2012	-19.0	-3.1	-0.3	0.0	0.0	0.0	0.0
2015	-33.0	-5.4	-0.5	-0.2	-0.1	-0.1	0.0

 TABLE 5.7-8

 Project-Related Aircraft Operational Emissions – Alternative 2 and 3 Compared to Alternative 1

Note: Project-related emissions reflect the difference between Alternative 1 (No Action) and Alternatives 2 and 3.

Source: CH2M HILL Analysis, 2008.

5.7.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on air quality associated with Alternative 3 during construction and operation. No significant impacts on air quality were identified for Alternative 3.

Construction Emissions

The construction impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

Operational Emissions

The operation impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

5.7.3.4 Conformity Analyses

A conformity determination is required for federal actions if total net direct and indirect emissions would exceed the applicable *de minimis* threshold or if the project related emissions would be regionally significant. The Clean Air Act General Conformity Regulation specifies that project emissions are regionally significant if they represent 10 percent of the projected regional total emissions for the pollutant. The General Conformity rules require consideration of the following analysis years [40 CFR 93.183]:

- 1. The year mandated by the Federal Clean Air Act amendments for attainment by the region or the latest year for which emissions are projected in the maintenance plan. The current maintenance plan shows continued attainment through 2017.
- 2. The year in which the total direct and indirect emissions from the project are greatest. As is noted in the prior sections, once constructed, the proposed projects would reduce operational emissions. Temporary emission increases due to construction would occur, and the peak year of construction emissions was estimated for 2010.
- 3. Any year for which the SIP specifies an emissions budget. The CO Maintenance Plan contains forecasts for point sources, area sources, on-road sources, and non-road sources for 2005, 2010, and 2017.

Table 5.7-9 shows the effect of adding construction and operational emissions to determine total project related-emissions. Construction of Alternative 2 or 3 would increase net CO emissions by 6.1 tons in 2010. In 2012, the operation of Alternative 2 or 3 would reduce net CO emissions by 19 tons compared to the No Action Alternative. Extrapolating the project-related emissions from the 2012 and 2015 analysis years shows that Alternative 2 or 3 would reduce CO emissions by 42.3 tons in 2017.

In accordance with the general conformity requirements, the first test is to compare projectrelated emissions to the applicable *de minimis* thresholds. Table 5.7-9 shows that projectrelated emissions for years 2010 (peak year of project-related emissions), and 2017 attainment year emissions would be below the *de minimis* threshold for the maintenance area.

TABLE 5.7-9

General Conformity Applicability Analysis: Net Project Related Direct and Indirect
Emissions (tons per year)

Analysis Year	CO Emissions		
2010			
Construction	6.1		
Operation	0		
Total	6.1		
De minimis threshold	100		
Are emissions de minimis?	Yes		
Maintenance Plan Projection ^a	462,172		
Project as a percentage of regional emissions	Less than 0.1% increase		
Are emissions regionally significant?	No		
2017			
Construction	0.0		
Operation	-42.3		
Total	-42.3		
De minimis threshold	100		
Are emissions de minimis?	Yes		
Maintenance Plan Projection ^a	456,133		
Project as a percentage of regional emissions	Reduces emissions		
Are emissions regionally significant?	No		

^aSource: Portland Area Carbon Monoxide Maintenance Plan, Oregon Department of Environmental Quality, December 10, 2004, Table 6.

Source: CH2M HILL, 2009.

The second test is to determine if project-related emissions would be regionally significant. The Portland Area CO Maintenance Plan estimated CO emissions in the Portland area airshed for 2005, 2010, and 2017 (DEQ, 2004). Table 5.7-9 shows the Portland Area CO Maintenance Plan projections of 486,359 tons per year in 2010, and 540,670 tons per year in 2017 for all sources in the airshed. As shown in Table 5.7-9, the proposed project-related emissions for 2010 reflect much less than 10 percent of total regional CO emissions. By 2017, project related emissions would decrease compared to the No Action Alternative. Therefore, the proposed project-would not be regionally significant. Because project-related emissions are less than *de minimis* and project-related emissions are not regionally significant, a conformity determination is not required.

5.7.3.5 Toxic Air Contaminants and Hazardous Air Pollutants

Toxic air contaminants (TACs) and hazardous air pollutants (HAPs) are components of VOC and particulate emissions. Alternatives 2 and 3 would reduce aircraft-related VOC and particulate emissions compared to the No Action Alternative. Operation of Alternatives 2 and 3 would therefore reduce TAC/HAP emissions.

5.7.3.6 Greenhouse Gases

Based on FAA data, operations activity at Hillsboro Airport, relative to aviation throughout the United States, represents less than 1 percent of U.S. aviation activity. Therefore, assuming that greenhouse gases occur in proportion to the level of activity, greenhouse gas emissions associated with existing and future aviation activity at Hillsboro Airport would be expected to represent less than 0.03 percent of U.S.-based greenhouse gases. Therefore, we would not expect the emissions of greenhouse gases from this project to be significant.

5.7.4 Mitigation and Measures to Avoid and Minimize Impacts

Because the proposed project would not result in significant air quality impacts, no mitigation is required. Although construction emissions would not require mitigation, measures to minimize construction emissions could include incorporating the provisions of FAA Advisory Circular 150/5370-10C, Standards for Specifying Construction of Airports, in project specifications.

5.8 Water Quality

The proposed Parallel Runway 12L/30R Project at Hillsboro Airport would add new impervious surface in the form of a new runway, new taxiway, and relocation of the existing Charlie Helipad. These additional impervious surfaces would introduce increased stormwater runoff and potential pollutants to stormwater that drains to nearby surface water bodies. This section discusses potential changes to water quality and quantity in the study area as a result of the proposed project.

5.8.1 Summary of Impacts

Surfaces at Hillsboro Airport drain to Glencoe Swale, a tributary of McKay Creek, on the north and to Dawson Creek on the south. Table 5.8-1 provides an overview of each basin and the increase in impervious surface on Airport property draining to each basin.

Proposed increase in impervious Surface per Drainage Basin for Alternative 2 and Alternative 3						
Basin	Total Basin Area (acres)	Basin Area on Airport Property (acres)	Total Impervious Surface on Airport Property with Alternative 1 (acres)	Net Increase in Impervious Surface (acres)	Total Impervious Surface on Airport with Alternatives 2 and 3 (acres)	Net Increase in Impervious Surface Within Basin on Airport Property
Glencoe Swale	753	537.5	32.0	13.3	45.3	42%
Dawson Creek	1,420	427.2	212.0	2.0	214	0.9%
Total		965.2	244.0	15.3	259.3	6.3%

TABLE 5.8-1

Proposed Increase in Im	nervious Surface ne	er Drainage Basin for	Alternative 2 and Alternative 3
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Alternative 1 would not increase the amount of impervious surface draining to Glencoe Swale compared to existing conditions. Both Alternative 2 and 3 would represent a 42 percent increase in impervious area draining to Glencoe Swale relative to the No Action Alternative. Approximately 5.9 percent of Airport property within the Glencoe Swale basin is currently impervious, and Alternatives 2 and 3 would bring this area to approximately 8.4 percent.

Alternative 2 and 3 would represent an approximately 0.9 percent increase in the impervious area draining to Dawson Creek. Because the increase in impervious area for Dawson Creek is below the margin of error for modeling and the increase in flows and pollutants would not be measurable, impacts to Dawson Creek are considered negligible. The analysis in this section therefore concentrates on the Glencoe Swale system. Increased flow to Glencoe Swale would be approximately 5.9 percent in a 10-year storm event and approximately 4.0 percent in a 100-year storm event, which does not exceed the defined threshold of significance.

Stormwater runoff from the new impervious surface in Alternatives 2 and 3 would be treated through a vegetated filter strip to reduce pollutant levels to below water quality criteria. Downstream pollutant concentrations in Glencoe Swale would be lower for Alternatives 2 and 3 compared to the No Action Alternative because the receiving water concentrations would be diluted by the increased runoff (see Table 5.8-2). Thus, no significant water quality impacts are expected with either build alternative.

Downstream Ambient Concentrations in Glencoe Swale Alternative 1 versus Alternatives 2 and 3			
Water Quality Parameter	Alternative 1 Downstream Ambient Concentration	Alternatives 2 and 3 Downstream Ambient Concentration	
TSS ^a	8.32 mg/L	7.35 mg/L	
Total copper ^b	2.9 μg/L	2.7 μg/L	
Total lead ^b	0.75 μg/L	0.68 µg/L	
Total zinc ^b	52.8 µg/L	50.0 µg/L	

TABLE 5.8-2

Notes:

mg/L = milligrams per liter; μg/L = micrograms per liter; SU = standard units ^a An existing background concentration in Glencoe Swale of 7.5 mg/L was assumed based on existing sample data.

^b An existing background concentration in Glencoe Swale of 0.0 µg/L was assumed based on lack of available sample data for metals.

5.8.2 Regulatory Setting, Threshold of Significance, and Methodology

The primary federal regulation that directs water quality management is the federal Clean Water Act, and numerous local and state regulatory programs have been developed pursuant to this act as well. Of specific relevance to this analysis is the National Pollutant Discharge Elimination System (NPDES) permit program that regulates industrial and non-industrial stormwater discharges, a federal program that is delegated to the state for implementation in Oregon.

5.8.2.1 Applicable Regulations and Standards

The federal Clean Water Act (CWA) Section 303(d) requires states to identify waters that do not meet water quality standards, and for which a total maximum daily load (TMDL) needs to be developed. TMDLs are developed for individual water bodies and for each pollutant within that water body that does not meet water quality standards. A TMDL establishes limits for pollutants to allow the water body to meet water quality standards. Water quality criteria are defined as acute or chronic by Oregon Department of Environmental Quality. The acute criteria refer to the average concentration for 1 hour and the chronic criteria refer to the average concentration for 96 hours (4 days). These criteria should not be exceeded more than once every 3 years (OAR 340, Division 41, Table 20).

While Glencoe Swale is not listed on DEQ's 303(d) list or listed as a TMDL water, McKay Creek, to which it drains, was added to DEQ's 303(d) list of impaired waters in 1998 for phosphorus, ammonia, E. coli, and temperature. Every 2 years, DEQ assesses water quality and reports to the U.S. Environmental Protection Agency (EPA) on the condition of Oregon's waters. The DEQ's 2004/2006 Integrated Report states that McKay Creek has been removed from the 303(d) list due to TMDL approval. TMDL listing may designate a specific water use of concern and in what part of the year the pollutant is considered an issue of concern; some pollutants are of

seasonal concern and some may be year-round. The TMDLs that have been approved for McKay Creek are summarized in Table 5.8-3.

Parameter	Impacts	Season
Phosphorus	Resident fish and aquatic life	June 1- September 30
Ammonia	Resident fish and aquatic life	June 1- September 30
E. coli	Water contact recreation	Year around
Temperature	Salmon and steelhead migration corridor	Year around (non- spawning)

 TABLE 5.8-3

 Approved TMDLs for McKay Creek (River Miles 0 to 15.8)

Source: DEQ 2004/2006 Integrated Report for McKay Creek.

The Port of Portland also has a NPDES 1200-Z permit from DEQ specifically for discharge of industrial stormwater from Hillsboro Airport, which includes areas used for vehicle maintenance and equipment cleaning operations, along with other activities. BMPs specific to these activities are required by this permit, and benchmarks are included which provide guidelines for pollutant concentrations, and are not intended as limits (Table 5.8-4). These benchmarks apply only to pollutants not limited by federal regulations. The state criteria for copper, zinc, and lead are more stringent than these benchmarks.

TABLE 5.8-4

NPDES 1200-Z Permit Stormwater D	Discharge Benchmarks
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Parameter	Benchmark
Total copper	0.1 mg/L
Total lead	0.4 mg/L
Total zinc	0.6 mg/L
pH	5.5-9.0 SU
TSS	130 mg/L
Total oil & grease	10 mg/L
Floating solids (associated with industrial activities)	No visible discharge
Oil & grease sheen	No visible sheen

Notes:

mg/l = milligrams per liter, SU = standard units

Source: Port of Portland NPDES General Permit No. 1200-Z.

Stormwater runoff from construction sites that disturbs one acre or more of land is regulated by DEQ under the NPDES 1200-CA permit. This permit requires implementation of a series of construction-related BMPs prior to discharge of stormwater runoff from disturbed areas.

The authorization for non-industrial stormwater discharge from this site is based upon Clean Water Services' (CWS) NPDES Municipal Separate Storm Sewer System Permit (MS4) for stormwater discharge, of which the City of Hillsboro is a co-permittee with CWS. Clean Water

Services is a Special District with responsibility for stormwater and wastewater within incorporated areas of Washington County. For Hillsboro Airport, the lead agency for this permit is CWS, but the requirements of the permit are implemented by the City of Hillsboro. These requirements specify best management practices (BMPs) for the treatment of stormwater runoff prior to its leaving the site. CWS and City of Hillsboro standards also require that any additional quantity of runoff not result in any adverse downstream impacts. Accepted BMPs are regulated under Clean Water Services' Resolution and Order (R&O) 07-20, Section 4.07, and City of Hillsboro's Ordinance No. 2808, Article VI.

5.8.2.2 Threshold of Significance

Based on FAA Order 1050.1E, Change 1, Appendix A, Section 17.3, the threshold of significance for water resources is as follows:

When an action has the potential to exceed water quality standards, there are water quality problems that cannot be avoided or satisfactorily mitigated, or there would be difficulty in obtaining a permit or authorization, there may be a significant impact.

5.8.2.3 Methodology and Assumptions

Water quality impacts in the study area's primary receiving water, Glencoe Swale, were assessed based on application of FHWA-RD-88-006 methodology (U.S. Department of Transportation [DOT], 1990) to assess the changes in water quality against applicable water quality criteria. FHWA based this industry-accepted environmental assessment methodology on a 10-year study to statistically predict pollutant loads. In concert with local sample data, this methodology predicts reasonable and defensible pollutant concentrations and quantities (loadings). This model is used by the Oregon Department of Transportation.

Impacts from the change in stormwater quantity from the project site were calculated based on industry-accepted Santa Barbra Urban Hydrograph Methodology and added to existing flows to assess downstream impacts. This model is approved by the City of Hillsboro and Clean Water Services. See Appendix C.4 for more details about the stormwater flow and water quality calculations.

For existing facilities, approximately half of the Airport stormwater runoff is not currently treated, while the other half drains to onsite engineered water quality treatment facilities. Water from new impervious areas would be treated through vegetated filter strips.

Water quality treatment of stormwater runoff through operational and construction BMPs was assumed at 70 percent removal of particulate pollutants and 30 percent removal of dissolved after treatment (International Stormwater BMP Database, 2008). These values represent typical minimum removal requirements for stormwater permits. Pollutants considered in this analysis included total suspended solids (TSS), copper, lead, and zinc, because increases in these pollutants are associated with increases in impervious surfaces. Other pollutants that may be monitored by the Port, such as oil and grease, were not evaluated because levels of these pollutants are associated with operations levels, not impervious surface area. Because operational patterns would not increase from the proposed project, the distribution of these pollutants to Dawson Creek or Glencoe Swale would not be significantly altered.
5.8.3 Environmental Impacts of Alternatives

This section quantifies the calculated impacts on water quality and the changes in stormwater runoff quantity from the No Action Alternative and the build alternatives.

5.8.3.1 Alternative 1 - No Action

Table 5.8-5 reports predicted pollutant concentrations in stormwater discharge at the point of discharge in Glencoe Swale for the No Action Alternative. These concentrations assume use of BMPs and after mixing in the swale has occurred. No exceedances of either the acute or chronic water quality standards would occur under the No Action Alternative.

5.8.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the water quality effects associated with Alternative 2 during construction and operation. No significant water quality impacts were identified for Alternative 2.

Construction Impacts

Construction impacts associated with Alternative 2 would primarily consist of sediment release through stormwater runoff. Measures to prevent construction impacts associated with erosion and sediment would be required and enforced through the Port's NPDES 1200-CA permit.

Water Quality Parameter	Pollutant Concentrations At Discharge Point	Downstream Ambient Concentration	Criterion	
			Acute	Chronic
TSS ^a	8.77 mg/L	8.32 mg/L	None	None
Total copper ^b	4.5 μg/L	2.9 μg/L	18.0 µg/L	12.0 μg/L
Total lead ^b	1.2 μg/L	0.75 μg/L	82.0 μg/L	3.2 μg/L
Total zinc ^b	81.4 μg/L	52.8 μg/L	120.0 µg/L	110.0 μg/L

TABLE 5.8-5

Notes:

mg/L = milligrams per liter; μ g/L = micrograms per liter

Pollutant Concentrations in Glencoe Swale - Alternative 1, No Action

^a An existing background concentration in Glencoe Swale of 7.5 mg/L was assumed based on existing sample data.

^b An existing background concentration in Glencoe Swale of 0.0 µg/L was assumed based on lack of available sample data for metals.

Source: CH2M HILL, 2008.

Erosion prevention and sediment control measures would also comply with Clean Water Services' Resolution and Order (R&O) 07-20, Chapter 6, and City of Hillsboro's Ordinance No. 2808, Article VI, in addition to Item 1156 of FAA Advisory Circular 150/5370-10A, Standards for Specifying Construction of Airports (FAA, 2007b). Nearby sensitive areas, such as wetlands, would be protected from stormwater runoff using these best management practices and impacts would not be significant.

Operational Impacts

Alternative 2 would increase the impervious surface in the Glencoe Swale drainage by 13.3 acres, or 42 percent, which would increase runoff to Glencoe Swale. Approximately 5.9 percent of Airport property within the Glencoe Swale basin is currently impervious, and Alternative 2 would bring this area to approximately 8.4 percent. There would be a minor increase in downstream flows in Glencoe Swale as a result of the increased impervious area. Downstream flows in Glencoe Swale would be increased by approximately 5.9 percent in a 10-year storm event and approximately 4.0 percent in a 100-year storm event.

All of the new impervious area constructed under Alternative 2 would receive water quality treatment using vegetative filter strips, an approved BMP under Clean Water Services' regulations, that filters out pollutants as water is dispersed across the vegetation. The vegetative filter strips would be designed and constructed as an engineered BMP in compliance with local regulations and the Port's *Wildlife Hazard Management Plan* (Port of Portland, 2007).

The operational impacts on water quality for Alternative 2 are reported in Table 5.8-6, which includes the predicted pollutant concentrations in stormwater discharges at the point of discharge in Glencoe Swale and downstream after mixing in the swale has occurred. These concentrations are compared to the acute and chronic criteria, as defined in Section 5.8.2.1. No calculated exceedance of either the acute or chronic water quality standards was indicated for Alternative 2. Water quality impacts would not reach the threshold of significance.

Downstream pollutant concentrations in Glencoe Swale would be reduced with Alternative 2 compared to the No Action Alternative, as shown in Table 5.8-2. These downstream concentrations are lower because the total flow is increased with Alternatives 2 and 3, which would dilute the receiving water concentrations.

5.8.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the water quality effects associated with Alternative 3 during construction and operation. No significant water quality impacts were identified for Alternative 3.

Construction Impacts

The construction impacts for Alternative 3 would be the same as for Alternative 2, as discussed in Section 5.8.3.2.

Operational Impacts

The impacts on water quality for Alternative 3 would be the same as Alternative 2 as discussed in Section 5.8.3.2 and shown in Table 5.8-6. A comparison of Alternative 3 with Alternative 1 is provided in Table 5.8-2.

Water Quality		Downstream Ambient	Criterion	
Parameter	At Discharge Point	Concentration	Acute	Chronic
TSS ^a	7.28 mg/L	7.35 mg/L	None	None
Total copper ^b	3.9 µg/L	2.7 μg/L	18.0 µg/L	12.0 µg/L
Total lead ^b	1.0 µg/L	0.68 µg/L	82.0 µg/L	3.2 µg/L
Total zinc ^b	71.8 μg/L	50.0 μg/L	120.0 µg/L	110.0 µg/L

 TABLE 5.8-6

 Pollutant Concentrations – Alternatives 2 and 3

Notes:

mg/L = milligrams per liter; μ g/L = micrograms per liter

^aAn existing background concentration in Glencoe Swale of 7.5 mg/L was assumed based on existing sample data.

^bAn existing background concentration in Glencoe Swale of 0.0 µg/L was assumed based on lack of available sample data for metals.

5.8.4 Mitigation and Measures to Avoid and Minimize Impacts

No significant impacts were identified; therefore no mitigation would be required. The permanent water quality treatment BMPs would be vegetative filter strips adjacent to all new impervious surfaces, as specified in Clean Water Services' R&O 07-20, Section 4.07, and City of Hillsboro's Ordinance No. 2808, Article VI. Minimum widths of the vegetative filter strips, designed in accordance with the above referenced requirements, are 9 feet for the runway, 6.4 feet for the taxiway, and 10 feet for Charlie Helipad. Current plans call for filter strip widths of 17 to 77 feet for the runway, 9 to 90 feet for the taxiway, and 20 feet for Charlie Helipad. The proposed BMPs substantially exceed minimum requirements, and treatment removal efficiencies should exceed those in the pollutant modeling.

Construction BMPs are expected to include, but not be limited to, sediment fences, wattles, inlet protection, and ground protection measures such as mulch and hydro-seeding. Specifications for erosion and sediment control would be performance-based, which requires that the contractor prevent the release of sediment from the project regardless of the BMPs specified in the plans. If the specified BMPs prove inadequate, then additional prevention measures must be put in place. In addition, incorporating the provisions of Advisory Circular 150/5370-10A, Standards for Specifying Construction of Airports, in project specifications would minimize water quality impacts.

5.9 Fish, Wildlife, and Plants

This section describes the regulatory setting, thresholds of significance, methodology, environmental consequences, potential mitigation, and measures to avoid and minimize impacts of the Hillsboro Airport Parallel Runway 12L/30R Project on fish, wildlife, and plants, including federally listed threatened and endangered species.

5.9.1 Summary of Impacts

No significant impacts on fish, wildlife, or plants are expected from Alternative 2 or Alternative 3. Alternative 2 and Alternative 3 would convert 70.4 acres of Airport land that are currently vegetated and undeveloped to impervious surface and managed vegetation. This includes 68.18 acres of predominantly Improved Pasture, Cultivated-Bareground/Irrigated, and Pervious Wasteland/Barren/Weedy Fill (see section 4.10), of which 6.30 acres are Vegetated Corridor as defined by Clean Water Services, and 2.22 acres are jurisdictional wetlands. In addition, 0.09 acres of regulated stormwater ditches are in the project area. The area between the proposed parallel runway and the existing Runway 12/30 would also be maintained more frequently as a grass infield area, instead of pasture land. Of the affected lands, the improved pasture area currently provides small mammal habitat and the wetlands are used by a variety of waterfowl. Filling wetlands within the construction footprint may reduce waterfowl use of Airport lands. A slight reduction in potential for birdstrikes may occur as some aircraft flight activity moves farther away from wetlands associated with Glencoe Swale. These changes are consistent with the *Hillsboro Airport Wildlife Hazard Management Plan* (Port of Portland, 2007).

Alternatives 2 and 3 would require clearing and grading for construction of the new runway, helipad, taxiways, and stormwater outfall (adjacent to the south side of Glencoe Swale) and would introduce the potential for erosion and sedimentation to Glencoe Swale, and the potential for sediment to enter the stormwater ditch and then Dawson Creek. These alternatives would also increase impervious surface by 15.3 acres, which would increase stormwater runoff within the project footprint. Alternatives 2 and 3 would both represent a 42 percent increase in Airport impervious area draining to Glencoe Swale relative to the No Action Alternative and an approximately 0.9 percent increase in the impervious area draining to Dawson Creek (see Section 5.8, Water Quality). As discussed in Section 5.8, stormwater flows attributable to Alternatives 2 and 3 are estimated to increase only 5.9 percent and 4.0 percent for the 10-year and 100-year storm, respectively, in Glencoe Swale downstream of the culverts under NE 25th Avenue, which effectively attenuate flows. The effect of the peak stormwater flows in the main stem of McKay Creek, the nearest downstream waterway in which fish listed as threatened or endangered under the Endangered Species Act are likely to be present, are calculated to be only 0.18 percent and 0.12 percent for the 10-year storms, respectively.

Stormwater flow increases in Dawson Creek for the 100-year event are calculated to be 0.9 percent. The effects on Rock Creek, the nearest downstream waterway where salmon or steelhead may be present, would be considerably less than changes in Dawson Creek. Due to the very small flow changes in McKay Creek and Dawson Creek, and even smaller flow changes downstream, increases in stormwater are expected to have no impacts on fish in the receiving waters.

Three species listed by the USFWS under the Endangered Species Act may occur in Washington County: the northern spotted owl, Kincaid's lupine, and Nelson's checker mallow, all listed as threatened. In addition to these species, two federally listed threatened fish species are found in the Tualatin River: Upper Willamette River Distinct Population Segment (DPS) steelhead and Upper Willamette River Evolutionarily Significant Unit (ESU) Chinook salmon. None of these federally-listed threatened or endangered plant or animal species are present in the project area. The project would have no effect on federally listed plants, terrestrial wildlife, and fish because no suitable habitat for these species occurs at HIO or the vicinity. No federally listed threatened or endangered plant species have been documented at HIO, nor were any observed during a reconnaissance-level survey of the site. The highly altered conditions and ongoing disturbances to vegetation indicate that it is extremely unlikely that the listed plants, Kincaid's lupine and Nelson's checker mallow, could survive there. No suitable habitat for the spotted owl is present on or near HIO. Listed fish and suitable stream habitat are not present at HIO or in the vicinity. Stormwater inputs from the project would not have a measurable effect on downstream receiving waters and no change in stormwater quality is expected. Based on these considerations, the FAA has determined the project would have "no effect" on federally-listed species or their habitats (see No Effects Memorandum in Appendix C.5).

5.9.2 Regulatory Setting, Thresholds of Significance, and Methodology

This section summarizes the regulations affecting fish, wildlife, and plants that could be affected by development at HIO, the thresholds used to define significant impacts on plants, wildlife, and fishery resources, as well as federally-listed threatened and endangered species. The methodology used to assess impacts on these resources is also discussed.

5.9.2.1 Applicable Regulations and Standards

The following sections discuss the regulations that guide the evaluation of fish, wildlife, and plants, including federally-listed threatened and endangered species.

49 USC Section 47106(c)(1)(B)

When review of an application for an airport development action involving a new airport, a new runway, or a major runway extension indicates the action would have significant adverse effects on natural resources including fish and wildlife, the Secretary of Transportation may approve that application, but only after finding that no possible and prudent alternative exists and that every reasonable step has been taken to minimize the adverse effects.

Federal Endangered Species Act (ESA)

The federal Endangered Species Act of 1973 was enacted to protect and conserve species listed as "threatened" and "endangered." Under the ESA, it is unlawful for anyone (private parties or state and federal entities) to "take" a listed species without authorization. To "take" is defined as to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species. Harm includes destruction of habitat necessary for survival. Incidental take, or take that is "incidental to, not the purpose of, carrying out an otherwise lawful activity," may be allowed subject to specific terms and conditions and with approval from the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS).

Section 7 of the ESA requires that through consultation (or conferencing for proposed species) with the USFWS and/or NMFS, federal actions do not jeopardize the continued existence of any

threatened, endangered, or proposed species or result in the destruction or adverse modification of critical habitat.

Oregon Endangered Species Act (Oregon ESA)

Oregon ESA provides protection to animal and plant species listed as threatened or endangered under Oregon Revised Statutes (ORS) 496.002 through 496.192. The Oregon ESA applies only to state agencies taking actions on state-owned or leased lands. Oregon's ESA is administered by Oregon Department of Fish and Wildlife (ODFW) for wildlife species and by Oregon Department of Agriculture (ODA) for plant species. Compliance with the Oregon ESA is typically achieved during consultations with the federal agencies pursuant to the federal ESA.

City of Hillsboro, Significant Natural Resources Overlay

Section 131A of the Hillsboro Zoning Ordinance provides protection for significant natural resources under Statewide Planning Goal 5 (Natural Resources) and the provisions of the Goal 5 administrative rule (OAR 660, Division 23). Significant natural resources are designated as significant wetlands, riparian corridors, and wildlife habitat. These resources have been inventoried and mapped within areas under the City of Hillsboro's jurisdiction according to the procedures, standards, and definitions established under Goal 5. The mapping provides a general idea of where significant Goal 5 natural resources (wetlands, riparian corridors, and wildlife habitat) may be located. The actual physical boundaries of these natural resources must be delineated prior to development or development activities occurring. A permit may be required to develop within significant natural resources or their protective buffers.

City of Hillsboro, Habitat-Friendly Development

Section 131B of the Hillsboro Zoning Ordinance implements the recommendations of the Tualatin Basin Fish & Wildlife Habitat Program aimed at encouraging the use of habitatfriendly development practices and low-impact development techniques. The intent is to provide flexibility in the land development ordinances to encourage the protection of qualified Habitat Benefit Areas as shown on the City of Hillsboro Significant Natural Resources Overlay District map (City of Hillsboro, 2009a).

Fish

The following state law applies to aquatic species only.

Oregon Department of Fish and Wildlife, In-Water Work Guidelines

Any project-related in-water work would be subject to in-water work period guidelines established by ODFW (ODFW, 2008) under the authority of Oregon Revised Statute 496.182. These guidelines specify that the preferred in-water work period for the tributary is July 15 to September 30, a season when tributaries are typically nearly dry. If no in-water work is required and work is outside the buffer, it is unlikely that ODFW would need to be involved. However, if the proposed project includes stormwater discharges or significantly alters hydrology in the basin, further coordination may be required.

Wildlife

The following federal, state, and local laws and regulations apply to wildlife.

The Bald and Golden Eagle Protection Act, as Amended

This law protects bald and golden eagles by prohibiting (except under certain conditions) the taking, possession, and commerce of such birds. "Taking" is defined under this act as "to

harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct," including modification to a species' habitat.

The act allows take, possession, and transportation of bald and golden eagles for scientific, educational, and Native American religious purposes, or in circumstances when take may be necessary to ensure the protection of wildlife, agriculture, or other interests particular to a specific locality. The act also allows for take of golden eagle nests that interfere with resource development or recovery operations. Prior to taking, possessing, or transporting any bald or golden eagle, or golden eagle nest, a permit must be obtained from the USFWS.

Migratory Bird Treaty Act of 1918, as Amended, 16 U.S. Code (USC) Sections 703-711

This federal law prohibits actions that may take a migratory bird species. If an action may take a migratory bird or affect its breeding habitat, consultation with the USFWS is needed. If it is determined that there are no feasible alternatives to taking the migratory bird or its nest, USFWS must issue a permit for the taking. Mitigation is typically required as part of the permit. The Port has consulted with and obtained a migratory bird permit from the USFWS, which includes an airport depredation permit for direct lethal control, if required, to ensure public aviation safety.

Oregon Administrative Rules 635-43-0000 to 0045

Under Oregon Administrative Rules (OAR) 635-43-0000 to 0045, a Scientific Taking Permit is required to capture or handle specific wildlife species in Oregon (see Wildlife Technical Memorandum in Appendix C.5 for a complete list of species).

Any person desiring to take wildlife in these categories for scientific purposes must first obtain a Scientific Taking Permit from ODFW. The Port holds a Scientific Taking Permit from ODFW for activities at all Port facilities, although no taking would occur for this project.

Oregon Administrative Rules 635-043-051 to 0115

Under OAR 635-0430951 to 0115, a property owner must obtain a Wildlife Harassing Permit from ODFW before harassing any wildlife on their property. Harassment is defined as any act that frightens or chases, but does not kill, wildlife. Harassment can be employed for scientific purposes pursuant to an ODFW program; to offer protection against a threat to human safety; to offer protection of land or property from damage; for wildlife management purposes pursuant to ODFW programs; or for rehabilitation of sick, injured, or orphaned wildlife. A Wildlife Harassing Permit is not required of those persons possessing a valid federal migratory bird permit authorizing harassment of migratory bird species. The current federal migratory bird permit that the Port maintains on an annual basis meets the ODFW state requirements under OAR 635-043-051 to 0115.

Plants

The following local agencies regulate plants in the Airport area.

City of Hillsboro

The City of Hillsboro Zoning Code contains a variety of regulations that address the impacts of development on vegetative communities including:

- Agricultural crops
- Upland forest communities
- Wetland communities

• Riparian communities

The City's regulations affecting these vegetative communities are designed to provide open space, buffers from noise, separation of conflicting uses, watershed protection, maintenance of clean air and water, and outdoor recreation activities. The City's Comprehensive Plan (City of Hillsboro, 2009b) encourages the preservation of existing wooded areas and significant trees and also encourages the planting of additional trees to enhance the surrounding community.

The City regulates vegetation in wetland and riparian areas specifically through its Significant Natural Resources Overlay District, a section of the Hillsboro zoning code. The Overlay District places limitations on certain development activities affecting vegetation within these areas, and requires permits in certain circumstances. Natural resources designated for protection within the City limits are indicated on the City's Significant Natural Resource Map.

Clean Water Services (CWS)

CWS is a water resource management utility responsible for protecting water quality in the Tualatin River and watershed. This agency enforces regulations that limit activities in the Tualatin River watershed that have the potential to negatively affect overall water quality. Applicable regulations focus on vegetated corridors adjacent to waterways, water bodies, and wetlands, defined collectively as "Sensitive Areas" (CWS, 2007). In addition, CWS limits development activities on the land immediately adjacent to these Sensitive Areas, the "Vegetated Corridor," as part of the water quality protection implementation plan.

The Sensitive Area regulations limit development in any Sensitive Area or Vegetated Corridor. The Sensitive Areas must first be identified, and the vegetation documented through a prescreening determination and an initial site assessment. If the initial site assessment indicates that there are Sensitive Areas present or within 200 feet of the development site, a Natural Resource Assessment is required. Depending on the potential extent and impacts of the development, an Alternatives Analysis and compensatory mitigation may also be required. Impacts on vegetation in Vegetated Corridors are restricted and mitigation is usually required in the form of replacement in kind, enhancement, or occasionally through a payment to provide option (CWS, 2007).

5.9.2.2 Thresholds of Significance

The following thresholds of significance for potential fish, wildlife and plant impacts are provided in FAA Order 1050.1E, Change 1, Appendix A, Section 8.3:

A significant impact to Federally-listed threatened and endangered species would occur when the FWS or NMFS determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat in the affected area...Lesser impacts including impacts on non-listed species could also constitute a significant impact...NEPA practitioners should consider factors affecting population dynamics and sustainability for the affected species such as reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), and the minimum population levels required for population maintenance...

5.9.2.3 Methodology

The identification of wildlife and fish populations and vegetative communities that could be affected by proposed development at HIO included the following steps:

- Background research on the regulations and background information affecting the Airport including baseline vegetation and wildlife datasets (*Hillsboro Airport Wildlife Hazard Management Plan*
- Review of previous reports performed concerning Airport lands for reference purposes
- Review of the Oregon Natural Heritage Information Center (ORNHIC) database for rare, threatened, and endangered plants and animal in the project area
- Review of USFWS Federally Listed, Proposed, Candidate Species, and Species of Concern under the Jurisdiction of the Fish and Wildlife Service which may occur within Washington County, Oregon
- Onsite reconnaissance to review the existing conditions

See Section 4.10 for a description of existing conditions.

5.9.3 Environmental Impacts of Alternatives

This section describes the environmental effects of the alternatives under consideration on fish, wildlife, and plants. The discussion addresses both construction and operational impacts of the proposed project.

Construction activities would cause specific impacts resulting solely from construction, but these activities would be limited to the summer construction season and thus are considered short-term. The effects are distinct in that they are temporary and their degree of adversity generally diminishes as work concludes. During construction, the Port would follow all applicable state and federal requirements, including FAA Advisory Circular 150/5370-10C, *Standards for Specifying Construction of Airports*, and would work to keep the impacts of construction activities to a minimum.

Operational impacts are assessed by specific type of disturbance to fish, wildlife, and plants.

5.9.3.1 Fish

This section describes the potential impacts of Alternatives 2 and 3 compared to Alternative 1.

The Hillsboro Airport (HIO) and associated land owned by the Port of Portland totals 965 acres. Of this area, 1.59 acres have been designated as stream habitat. This habitat consists of Glencoe Swale, an intermittent tributary of McKay Creek that crosses the north end of HIO. McKay Creek is a tributary to Dairy Creek, which in turn is a tributary to the Tualatin River, which joins the Willamette River at approximately river mile 28.5. At the southeast corner of HIO, a stormwater ditch conveys stormwater to Dawson Creek, which flows to Rock Creek, also a tributary of the Tualatin River.

Upper Willamette River Distinct Population Segment (DPS) steelhead and Upper Willamette River Evolutionarily Significant Unit (ESU) Chinook salmon are both federally listed as threatened under the ESA. Both species occur in the Tualatin River, a tributary of the Willamette River and the eventual receiving water body for both the McKay Creek and Dawson Creek systems. The Tualatin River is approximately 4.3 stream miles downstream from HIO. Neither species is present at HIO or in the vicinity, nor is there suitable habitat for them on HIO (see No Effects Memorandum, Appendix C.5).The following discussion of fish impacts focuses on the effects on listed species and the potential impacts on downstream aquatic habitats. The impacts would be indirect downstream effects on water quality and quantity through stormwater discharge. The assumption is that the effects on listed species and their habitats would be similar to the effects on other resident fish species in the aquatic resource.

Alternative 1 - No Action

As the baseline condition, there would be no changes to streams in the HIO vicinity; therefore, no operational impacts on fish are expected to occur as a result of Alternative 1.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts on fish associated with Alternative 2 during construction and operation. No significant impacts on fish were identified for Alternative 2.

Construction Impacts

Construction impacts on fish and aquatic resources could potentially include increased stormwater runoff and subsequent sediment contaminant loading. However, for the reasons discussed below, potential impacts on fish and fish habitat are unlikely to occur as a result of this project.

Clearing and grading for construction of the new runway, helipad, taxiways, and stormwater outfall (adjacent to the south side of Glencoe Swale) would introduce the potential for erosion and sedimentation to Glencoe Swale, and the potential for sediment to enter the stormwater ditch and then Dawson Creek. Suspended sediment has been shown to change salmon behavior and cause mortality if turbidity concentrations are high. The sub-lethal effects of turbidity generally include salmon avoidance and redistribution, reduced feeding and growth, respiratory impairment, reduced tolerance to disease and toxicants, and physiological stress. Increased sediment deposition can degrade downstream spawning and rearing habitat and can alter riparian vegetation. Construction related site disturbances would be limited to the dry summer construction season and the site itself would be stabilized and re-vegetated as appropriate prior to the rainy season, effectively limiting the opportunity for stormwaterentrained sediments to enter downstream aquatic habitats. Downstream impacts would be further minimized through implementation of erosion and sediment control BMPs at the project site.

Operational Impacts

The increase in new impervious surface (15.3 acres) is expected to increase stormwater runoff generated from within the project site. Of this area, 2 acres of new impervious surface would be in the Dawson Creek basin. The subsequent increase in stormwater flow into Dawson Creek would be approximately 0.9 percent for the 100-year event. The effects on Rock Creek, the nearest downstream waterway where salmon or steelhead may be present, would be considerably less than changes in Dawson Creek (see Appendix C.5 for a discussion of the drainage basin). Due to the small flow changes no impacts on fish in the receiving waters are expected.

As discussed in Section 5.8, Water Quality, stormwater flows attributable to Alternative 2 in Glencoe Swale below the NE 25th Street culverts are estimated to increase 5.9 percent and 4.0 percent for the 10-year and 100-year storm, respectively. The increase of the peak stormwater flows in the mainstem of McKay Creek, the nearest downstream waterway in which listed fish

are likely to be present, are calculated to be 0.18 percent and 0.12 percent for the 10-year and 100-year storms, respectively. These increases were found to be insignificant.

Stormwater from the increased impervious surface would be conveyed to stormwater treatment facilities to improve water quality prior to discharge into Glencoe Swale or the stormwater ditch that drains to Dawson Creek in the southeast part of HIO. Although water temperature is a concern for fish, both the Glencoe Swale and the stormwater ditch have intermittent flows that primarily convey stormwater during the rainy season and do not flow in the summer when elevated ambient water temperature are a concern. Therefore no project-related impact on water temperature is expected. Similarly, dissolved oxygen levels are typically low when water temperatures are high. As neither Glencoe Swale nor the stormwater ditch contributes flow to McKay Creek or Dawson Creek, respectively, during summer, the development of Alternative 2 is not expected to affect dissolved oxygen levels in those systems during the summer and would not impact fish species in these creeks.

As discussed in Section 5.8, Water Quality, downstream ambient concentrations for other water quality parameters important for fish, including total suspended solids, total copper, total lead, and total zinc would be less than under Alternative 1, and would be well below state criteria for these pollutants. Because aircraft operations would not increase as a result of the proposed project, the quantity of pollutants directly associated with aircraft operations such as jet fuel and hydraulic oil would not be altered over the baseline condition.

Based on the reasons provided below, FAA has determined the project would have "no effect" on federally-listed fish species or their habitats (see No Effects Memorandum, Appendix C.5).

A determination of no effect for Upper Willamette River DPS steelhead is appropriate because:

- No steelhead are documented or known to occur in Glencoe Swale or the drainage ditch to Dawson Creek.
- The nearest potential suitable habitat is 2.8 miles downstream in McKay Creek; and in Dawson Creek.
- The nearest critical habitat is 6.0 miles downstream from HIO, and extends upstream in the Tualatin River from that point.
- No construction is proposed within ordinary high water (OHW) of Glencoe Swale or within the drainage ditch to Dawson Creek.
- There would be negligible changes to flow attributable to the proposed project, in the receiving waters.
- The project would decrease concentrations of potential contaminants in the receiving waters, compared to Alternative 1.

A determination of no effect for Upper Willamette River ESU Chinook Salmon is appropriate because:

• No Chinook salmon are documented or known to occur in Glencoe Swale or the drainage ditch to Dawson Creek.

- No potential migration, spawning or rearing habitat, nor critical habitat, is mapped in either the Dairy Creek or Rock Creek drainages.
- No construction is proposed within OHW of Glencoe Swale or within the drainage ditch to Dawson Creek.
- There would be negligible changes to flow attributable to the proposed project, in the receiving waters.
- The project would decrease concentrations of potential contaminants in the receiving waters, compared to the no action alternative.

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on fish associated with Alternative 3 during construction and operation. No significant impacts on fish were identified for Alternative 3.

Construction Impacts

Construction impacts on fish attributable to Alternative 3 would be the same as for Alternative 2.

Operational Impacts

Operational impacts on fish attributable to Alternative 3 would be the same as for Alternative 2. Impacts on federally-listed threatened and endangered fish species and their habitat from the two alternatives would be the same, including the determination of "No Effect."

5.9.3.2 Wildlife

This section describes the impacts from each alternative on wildlife. Table 5.9-1 identifies the state and federal listed terrestrial species found in Washington County. As noted in Section 4.10, no rare, threatened, or endangered wildlife species or their habitats are present at HIO.

State and Federal Listed Terrestrial Species in Washington County

		• •	
Species	State Status	Federal Status	Jurisdiction and Notes
Bald eagle Haliaeetus Ieucocephalus	Threatened	De-listed	ODFW, USFWS (also protected under the Bald and Golden Eagle Act)
Northern spotted owl Strix occidentalis caurina	Threatened	Threatened	ODFW, USFWS
Streaked horned lark Eremophila alpestris strigata		Candidate for listing	ODFW, USFWS

Source: USFWS 2008; ODFW 2008

According to a search of the ORNHIC, no rare, threatened, or endangered terrestrial species are documented at HIO (ORNHIC, 2008). The nearest record of a state-listed species is about 3 miles to the southwest at Jackson Bottoms, where a bald eagle nest is documented (ORNHIC, 2008). Bald eagles generally perch, roost, and build nests in mature trees near water bodies and

TABLE 5.9-1

available prey, usually away from intense human activity (USFWS, 1986). No suitable nesting habitat for the bald eagle is located at HIO, and the onsite wetlands do not provide unique wintering habitat for this species, given the presence of other wetlands and agricultural fields in the greater project vicinity.

The northern spotted owl requires extensive tracts of old-growth forest or forests with mature trees and multiple canopy layers, away from intensive human development (55 Federal Register 26114). No suitable breeding or foraging habitat for the spotted owl is located at HIO or the vicinity. The streaked horned lark is a passerine of open lands and uses the sandy, barren areas at the Portland International Airport, but has not been observed at HIO (Nick Atwell, Wildlife Manager, Port of Portland, Portland, Oregon, September 17, 2008, personal communication with S. Hartung, ESA Adolfson; see Wildlife Technical Memorandum, Appendix C.5).

Alternative 1 - No Action

No additional habitat would be converted under this alternative; therefore, no significant impacts on wildlife are expected to occur as a result of Alternative 1.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts on wildlife associated with Alternative 2 during construction and operation. No significant impacts on wildlife were identified for Alternative 2.

Construction Impacts

Voles and other small rodents would likely suffer mortality during construction due to clearing and grading the grass/forb habitat in preparation for constructing the new runway and helipad. The reduction of voles (raptor prey base) is consistent with the *Hillsboro Airport Wildlife Hazard Management Plan*. Other wildlife species that may be present onsite are expected to be able to avoid construction activities.

Operational Impacts

Shifting some flight activity 700 feet to the east, while maintaining the same total number of operations as Alternative 1, is not expected to substantially increase the potential for bird or wildlife aircraft collisions, which are collectively called airstrikes. A slight reduction in the potential for airstrikes may occur because some flight activity would be farther away from the wetlands along Glencoe Swale that seasonally attract waterfowl. This area is identified as Management Area C in the *Hillsboro Airport Wildlife Hazard Management Plan* (Port of Portland, 2007).

Alternative 2 would reduce the amount of vole and other small mammal habitat in the study area by 70.4 acres. Grass/forb areas and pastures are the most common habitat types at HIO and on surrounding Port-owned property where populations of voles and other rodents have been observed. Reducing the small mammal habitat would reduce the prey base for raptors, and could in turn lead to a reduction in the risk of airstrikes with red-tailed hawks, owls, and other raptors.

This alternative would also alter foraging habitat used by birds such as barn swallows, by converting grass/forb habitat to impervious surface. These birds would be expected to find suitable foraging habitat in other areas at HIO or in the vicinity. Filling wetlands within the construction footprint may reduce waterfowl use of the Airport. None of the impacts described is this section would exceed the thresholds of significance listed in Section 5.9.2.2.

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on wildlife associated with Alternative 3 during construction and operation. No significant impacts on wildlife were identified for Alternative 3.

Construction Impacts

Construction impacts on wildlife attributable to Alternative 3 would be the same as for Alternative 2.

Operational Impacts

The operational impacts on wildlife would be the same as discussed for Alternative 2.

5.9.3.3 Plants

This section describes the impacts from each alternative on plants. As noted, the project would take place wholly within the highly managed and maintained airfield at HIO, and in terms of impacts to vegetation would directly convert relatively uniform monotypic airfield turf grasses or agricultural grass crops (also monotypic) to airport runway and taxiway infrastructure. The project would have no effect on federally listed plants because no suitable habitat for these species occurs at HIO or in the vicinity. No federal or state listed threatened or endangered plant species are documented at HIO, and none were observed during a reconnaissance-level survey of the site. The highly altered conditions and ongoing disturbances to vegetation incurred by airfield maintenance indicate that it is extremely unlikely that listed plants could survive there.

Alternative 1 - No Action

No additional conversion of airfield grasses to airfield pavement would occur under this alternative; therefore, no operational impacts on plants are expected to occur as a result of Alternative 1.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts on plants associated with Alternative 2 during construction and operation. No significant impacts on plants were identified for Alternative 2.

Construction Impacts

No impacts on plants are expected beyond the permanent removal of vegetation described below under operational impacts.

Operational Impacts

Alternative 2 would result in the conversion of approximately 70.4 acres of Airport land that are currently vegetated and undeveloped, of which 6.30 acres are Vegetated Corridor as defined by Clean Water Services and 2.22 acres are emergent and herbaceous wetland community. Table 5.9-2 presents the acreage of the habitat types shown in Exhibit 5.9-1. The area between the proposed parallel runway and the existing Runway 12/30 would also be managed more frequently as a grass infield area, instead of pasture land.

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on plants associated with Alternative 3 during construction and operation. No significant impacts on plants were identified for Alternative 3.



Data Sources: ESA Analysis, 2008 Port of Portland, 2008 Metro RLIS, 2008



EXHIBIT 5.9-1 Habitat Impacts from Alternative 2 Hillsboro Airport Parallel Runway 12L/30R Environmental Assessment

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Construction Impacts

Construction impacts attributable to Alternative 3 would be the same as for Alternative 2.

Operational Impacts

Operational impacts attributable to Alternative 3 would be similar to those for Alternative 2, as shown in Table 5.9-2 and Exhibit 5.9-2. The total acreage converted would remain the same.

TABLE 5.9-2

Alternatives 2 and 3 - Area of Habitat Impact

	Acres Converted		
Habitat Classification ^a	Alternative 2	Alternative 3	
Improved Pasture - Perennial Grass Seed/Hay	37.5	37.5	
Cultivated - Bareground/Irrigated	18.6	17.6	
Pervious Wasteland/Barren/Weedy Fill	11.0	12.6	
Other/Not Classified ^b	3.3	2.7	
Total	70.4	70.4	

^a From Wildlife Hazard Management Plan (WHMP), Port of Portland, 2007

^b Other includes less than half an acre of the following: blackberry scrub-shrub, cottonwood/willow scrub-shrub, ditchroadside, grass/forb-mowed, and developed-pervious. Not classified areas include areas within the limits of disturbance that were not classified as part of the WHMP

5.9.4 Mitigation and Measures to Avoid and Minimize Impacts

Compensatory mitigation would be required for unavoidable impacts on regulated Vegetated Corridors as required by CWS. Compensatory mitigation for jurisdictional wetland impacts is discussed in Section 5.10, Wetlands. Other operational and construction impacts on vegetation, wildlife, and fish can be avoided or minimized through site planning and construction BMPs, as discussed below.

5.9.4.1 Mitigation

The project would permanently convert 6.3 acres of Vegetated Corridor that are regulated by CWS. These Vegetated Corridors are buffers around jurisdictional wetlands and can range from 15 feet wide to 50 feet wide, depending on the wetland. While these impacts do not exceed the thresholds of significance defined in Section 5.9.2.2, mitigation would be required by CWS for Vegetated Corridor impacts. There would be no impacts on federally- or state-listed plant species since none were found on the project site.

Compensatory mitigation of vegetation is proposed for unavoidable impacts on regulated Vegetated Corridors. The Vegetated Corridors that would be impacted by the proposed project are maintained as part of the mowed airfield and are classified by CWS as a "degraded condition" (CWS, 2007). Mitigation for both upland and wetland impacts of the project would be constructed at the Jackson Bottom Wetland Preserve, 3.5 miles from the Airport within the Tualatin River basin and is further discussed in Section 5.10.4.



Data Sources: ESA Analysis, 2008 Port of Portland, 2008 Metro RLIS, 2008



EXHIBIT 5.9-2 Habitat Impacts from Alternative 3 Hillsboro Airport Parallel Runway 12L/30R Environmental Assessment

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The mitigation for vegetated corridors would consist of enhancement planting of the mitigation site, subsequent to additional coordination with CWS, as allowed in Chapter 3.08 1(B) of CWS Design and Construction Standards (R&O 07-20) and in accordance with the Intergovernmental Agreement between the Port of Portland, Oregon Department of Transportation, Clean Water Services, and the City of Hillsboro (see Appendix C.6). The upland portion of the mitigation site would be planted with native vegetation and would meet the requirements for a "good condition" buffer (CWS, 2007). This mitigation site would be higher functioning in characteristics of native vegetation, wildlife habitat, fish habitat, flood water storage, sediment retention, and possibly removal or storage of nutrients than the area impacted by the project.

5.9.4.2 Measures to Avoid Impacts

The layout for the proposed new facilities has been carefully analyzed to avoid stream and vegetation impacts to the greatest extent possible, thereby minimizing impacts on vegetation, fish, and wildlife that use those habitats. Layouts that were analyzed consisted of various distances between the existing runway 12/30 and the proposed parallel runway, and various positions of the proposed helipad relative to the parallel runway.

Impacts on fish, wildlife, and plants would be further minimized by keeping the construction footprint as small as possible while enabling construction that meets all requirements for HIO's operation. Minimization of the construction footprint would minimize loss of habitat for small mammals, and would therefore minimize impacts on birds of prey.

Measures to avoid and minimize the possibility of impacts on fish during construction include the following:

- Construction BMPs would be implemented to avoid or effectively minimize erosion and sedimentation from exposed soils during construction.
- The project would be designed to include BMPs to effectively control and manage both stormwater quality and stormwater quantity over the long term. Stormwater BMPs would be designed to effectively limit flow from new impervious surface to closely match existing baseline conditions. Subsequent study and analysis of the stormwater quality and quantity mitigation would also include an analysis of loading and flow contributions during smaller, more normal flow events compared to the 10-, 25-, and 100-year events included in Appendix C.4, Water Quality.

5.10 Wetlands

This section describes the regulatory setting, the threshold of significance, the methodology used to assess wetland impacts, the environmental consequences, potential mitigation, and measures to avoid and minimize impacts of the Hillsboro Airport Parallel Runway 12L/30R Project on wetlands. The on-Airport wetlands have already been highly modified by grading, plowing and other agricultural uses, and drainage improvements. The term "wetlands" generally includes other features regulated by state or federal agencies, such as ditches (which may qualify as "other waters" under the federal regulation). These features are identified and discussed separately, where appropriate.

5.10.1 Summary of Impacts

Development of Alternative 2 or Alternative 3 would both result in permanent loss of 2.22 acres of wetlands. Wetlands that would be impacted range in size from 0.01 acre to 1.71 acres, with the largest wetland being only partly impacted. All wetlands that would be impacted are vegetated primarily, if not exclusively, by non-native grasses and opportunistic weedy species.

In addition to wetlands, 0.09 acre of other regulated waters would be impacted. These "other waters" are excavated roadside ditches located along roadways to convey stormwater. These ditches range from 2 to 4 feet wide but do not convey water wider and deeper than 1 foot.

5.10.2 Regulatory Setting, Threshold of Significance and Methodology

Federal, state, and local regulations for wetland resources that could be affected by development at HIO are summarized below. This section also describes the thresholds used to define significant impacts on these resources.

5.10.2.1 Applicable Regulations and Standards

Wetlands in Oregon are regulated by both the U.S. Army Corps of Engineers (USACE) and Oregon's Department of State Lands. As will be seen, the extent of regulation differs somewhat, meaning that certain wetlands may be regulated by one agency but not the other.

Federal wetland regulations include:

- Executive Order 11990, Protection of Wetlands,
- DOT Order 5660.1A, Preservation of the Nation's Wetlands
- Section 404 of the Clean Water Act (CWA) (Federal Water Pollution Control Act, as amended, 33 USC 1251, et seq.);
- Section 10 of the Rivers and Harbors Act of 1889

Executive Order 11990 requires federal agencies to ensure their actions minimize the destruction, loss or degradation of wetlands and to assure the protection, preservation, and

enhancement of the nation's wetlands to the fullest extent practicable during the planning, construction, funding and operation of transportation facilities and projects.

DOT Order 5660.1A requires that transportation facilities should be planned, constructed, and operated to assure protection and enhancement of wetlands.

The USACE is authorized to implement Section 404 and Section 10 regulatory programs. Wetlands adjacent to, abutting, or with significant hydrologic connections to waters of the U.S. are regulated by the USACE. The USACE has determined that all impacted wetlands listed in Table 5.10-1 and Exhibits 5.10-1 and 5.10-2 fall under their jurisdiction with the exception of wetlands AB, W, X, 1, 2, 3, and 4.

These wetlands do not meet the requirements for USACE regulation because they are isolated, depressional wetlands and lack a hydrologic connection to waters of the U.S. (see USACE jurisdictional determination dated March 20, 2009 in Appendix C.6).

State wetland regulations under the Oregon Removal Fill Law (ORS 196.795-990) are implemented by the Department of State Lands (DSL) through Oregon Administrative Rule 141-085. All of the wetlands mapped on the Airport are subject to state regulation under the Removal Fill Law (see delineation concurrence letter from DSL dated July 15, 2009, in Appendix C.6).

In addition to jurisdictional wetland impacts, 0.15 acre of roadside stormwater conveyance ditches on the airfield would be impacted (Table 5.10-2); 0.09 acre of these ditches is regulated as "other waters" by USACE as described in the jurisdictional determination (Appendix C.6).

Roadside ditches are exempt from the Oregon Removal Fill law if they are less than 10 feet wide and not contiguous with other wetlands, per OAR 141-085-0515 (10). Consequently, none of these "other waters" within the project area are regulated by the state (see DSL delineation concurrence letter in Appendix C.6).

5.10.2.2 Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A, Section 18.3 notes the following thresholds of significance for wetlands:

A significant impact would occur when the proposed action causes any of the following:

18.3a. The action would adversely affect the function of a wetland to protect the quality or quantity of municipal water supplies, including sole source, potable water aquifers.

18.3b. The action would substantially alter the hydrology needed to sustain the functions and values of the affected wetland or any wetlands to which it is connected.

18.3c. The action would substantially reduce the affected wetland's ability to retain floodwaters or storm-associated runoff, thereby threatening public health, safety or welfare (this includes cultural, recreational, and scientific resources important to the public, or property).

18.3d. The action would adversely affect the maintenance of natural systems that support wildlife and fish habitat or economically-important timber, food, or fiber resources in the affected or surrounding wetlands.

Wetland ID	Total Wetland Area (acres)	Wetland Impact Area (acres)	USACE Jurisdiction	Oregon DSL Jurisdiction
А	0.27	0.27	Yes	Yes
В	0.47	0.47	Yes	Yes
I	0.03	0.03	Yes	Yes
J	0.05	0.05	Yes	Yes
К	0.01	0.01	Yes	Yes
L	0.06	0.06	Yes	Yes
Ν	0.01	0.01	Yes	Yes
0	0.01	0.01	Yes	Yes
Ρ	0.02	0.02	Yes	Yes
R	1.71	0.30	Yes	Yes
W	0.36	0.36	No	Yes
х	0.17	0.17	No	Yes
AB	0.01	0.01	No ^a	Yes
1	0.03	0.03	No	Yes
2	0.03	0.03	No	Yes
3	0.02	0.02	No	Yes
4	0.04	0.04	No	Yes
9	0.05	0.05	Yes	Yes
10	0.12	0.12	Yes	Yes
11	0.03	0.02	Yes	Yes
12	0.04	0.04	Yes	Yes
13	0.03	0.03	Yes	Yes
15	0.07	0.07	Yes	Yes
Total Area	3.64	2.22	1.56	2.22

 TABLE 5.10-1

 Wetland Impacts for Alternative 2 or Alternative 3

^a Wetland AB was delineated after the delineation report was submitted to the USACE but is an isolated wetland and is not likely regulated by USACE. Final determination will be made by USACE during permitting. Impacts on wetland AB are proposed for mitigation due to assumed DSL jurisdiction.



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Water ID	Total Area of Water (acres)	Water Impact Area (acres)	USACE Jurisdiction	Oregon DSL Jurisdiction
Ditch D	0.05	0.04	Yes	No
Ditch M	0.12	0.05	Yes	No
Ditch Y	0.19	0.03	No	No
Ditch Z	0.03	0.03	No	No
Total Area of Other Waters	0.39	0.15	0.09	0.00

TABLE 5.10-2 Other Waters Affected by Alternatives 2 and 3

18.3e. The action would promote development of secondary activities or services that would affect the resources mentioned in items (1) through (4) in this section.

18.3*f.* The action would be inconsistent with applicable State wetland strategies.

5.10.2.3 Methodology and Assumptions

Six previous studies (listed below) have identified wetlands on the Airport. Due to changes in federal regulations, the federal jurisdictional status of some of the wetlands may have changed since the early wetland delineations were conducted. Additionally, Oregon Department of State Lands (DSL) has a 5-year limitation on wetland delineations. Delineations that were concurred with by DSL more than 5 years ago have expired, and must be re-delineated if impacts are proposed.

To ensure that the most recent information was used, a field reconnaissance of the study area was conducted in August 2008, along with review of the following wetland studies that were conducted between 1997 and 2009:

- A wetland delineation in the area proposed for construction of the parallel runway (ICF Jones and Stokes, 2009)
- A wetland determination on the site originally proposed for construction of the Charlie Helipad (ICF Jones & Stokes, 2008)
- A wetland delineation by Parametrix (2007) which identified wetlands between the existing Runway 12/30 and Taxiway Alpha
- A wetland delineation of the existing helipad location (Jones & Stokes Associates, 2004)
- Wetland delineations by Entranco (2000) and David Evans and Associates (1997) along McKay Creek, north of Runway 12/30, north and south of Northeast Evergreen Road, and extending west of NE 25th Avenue.

5.10.3 Environmental Impacts of Alternatives

Potential environmental consequences of each considered alternative are described in this section. Each alternative is briefly described, followed by descriptions of the operational and construction impacts.

5.10.3.1 Alternative 1 - No Action

Development of the Taxiway C Extension project, part of the No Action Alternative, resulted in permanent impacts to a wetland (0.057 acres) that were permitted under a USACE nationwide permit for linear transportation project (NWP-2007-1033) and an Oregon DSL fill permit (40015-FP). Compensatory wetland mitigation was completed at an approved off-site location.

5.10.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section discusses the potential impacts on wetlands from construction and operation of Runway 12L/30R with Charlie Helipad Option A. Development of Runway 12L/30R and the relocated Charlie Helipad would cause permanent wetland impacts. These wetland impacts would exceed the thresholds of significance identified in Section 5.10.2.2.

Construction Impacts

Temporary construction impacts on wetlands that will not be permanently impacted could occur due to increased erosion and sedimentation from site runoff associated with construction activities. These potential impacts would be mitigated by using construction BMPs. Practicable erosion control measures such as silt fencing, bio bags, sediment collection basins, gravel entryways, and tire wash areas would be installed prior to the commencement of construction and properly maintained throughout the duration of the project to keep sediment from entering the wetlands and other waterways in the project vicinity. Following completion of construction, all disturbed areas would be stabilized and re-vegetated with an approved groundcover material. Refer to the Joint Permit Application (Appendix C.6) for detailed information regarding construction BMPs.

Operational Impacts - Wetlands

Development of Alternative 2 would result in permanent loss of 2.22 acres of wetlands, all of which are regulated by DSL and 1.56 acres of which are regulated by USACE. Alternative 2 would affect 23 separate wetlands. These wetlands are listed in Table 5.10-1 and shown in Exhibit 5.10-1. The wetlands are palustrine-emergent seasonally flooded/saturated (PEME) wetlands and include both slope/flats and flats hydrogeomorphic (HGM) classifications. Individual wetlands that would be impacted range from 0.01 acre to 1.71 acres, with the largest wetland being only partly impacted. All wetlands that would be impacted are vegetated primarily, if not exclusively, by grasses cultivated for grass seed and opportunistic weedy species and have low function and value as described in the HGM analysis included in Appendix C.6.

Operational Impacts – Other Waters

As noted above, four roadside stormwater conveyance ditches totaling 0.15 acre would be impacted (Table 5.10-2). Two of these ditches, totaling 0.09 acre, are regulated by the USACE as "other waters" (ditches D and M). They are not regulated by DSL. The remaining ditches (Y and Z) are not regulated by either agency. These ditches are man-made, maintained for

stormwater conveyance, and generally lack vegetation. The bottoms of the ditches consist of gravel, silts, and mud. Due to the low function and value of the stormwater conveyance ditches, mitigation is not being proposed for these impacts.

5.10.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This alternative differs from Alternative 2 only in the location of the proposed Charlie Helipad. Development of Runway 12L/30R and the relocated Charlie Helipad would cause permanent wetland impacts. These wetland impacts would exceed the thresholds of significance identified in Section 5.10.2.2.

Construction Impacts

Construction impacts attributable to Alternative 3 are anticipated to be the same as for Alternative 2.

Operational Impacts

Operational impacts attributable to Alternative 3 would be the same as for Alternative 2. The components of the two alternatives are nearly identical, with the difference being in the location of the Charlie Helipad. Impacts on wetlands and other waters from the two alternatives would be the same, the permanent loss of 2.22 acres of jurisdictional wetlands and 0.09 acre of regulated roadside ditches (Table 5.10-1, Exhibit 5.10-2, and Table 5.10-2).

5.10.4 Mitigation and Measures to Avoid and Minimize Impacts

Many construction and operational impacts on wetlands can be avoided or minimized through site planning and construction best management practices (BMPs). No practicable alternative that would avoid or minimize all wetland impact is available. Alternatives 2 and 3 minimized wetland impacts to the extent practicable. Compensatory wetlands mitigation described in Section 5.10.4.1 would be provided for 2.22 acres of permanently impacted wetlands.

5.10.4.1 Mitigation

Compensatory wetland mitigation would be provided for all unavoidable wetland impacts. The proposed mitigation involves restoring historic wetlands and enhancing existing wetlands at an offsite location at a ratio of 1:1 impact to mitigation for restoration and at a ratio of 3:1 for enhancement. The restored and enhanced wetlands would provide several wetland functional characteristics and values that would exceed the functions and values of the impacted wetlands. They would be higher functioning in characteristics of native vegetation, wildlife habitat, fish habitat, flood water storage, sediment retention, and possibly removal or storage of nutrients.

The compensatory wetland mitigation site is located within the Jackson Bottom Wetland Preserve, a large wetland complex in the Tualatin River floodplain (Exhibit 5.10-3). The mitigation project would result in the restoration of former wetlands and enhancement of existing wetlands within the larger habitat unit of the wetland preserve.



Exhibit 5.10-3 Location of Jackson Bottoms Wetland Mitigation Site The Port of Portland, Oregon Department of Transportation, City of Hillsboro, and Clean Water Services developed an intergovernmental agreement (IGA) which allows the parties to work cooperatively to restore and enhance wetlands at the Jackson Bottom Wetland Preserve for the purpose of generating wetland and upland mitigation credits required under federal, state, and local regulations. The IGA was signed in July 2009 and a copy of the final IGA is included in Appendix C.6. The City of Hillsboro and CWS both own property at the Jackson Bottom Wetland Preserve, but the compensatory wetland mitigation will occur entirely on the City of Hillsboro's property. The wetland mitigation project would meet all wetland mitigation requirements for this project.

The planned mitigation would restore former wetlands by removing piles of material that were placed in Jackson Bottom Wetland Preserve in the early 1980's when a large water quality treatment pond was excavated on the preserve. Removal of the material would restore the original hydrology and surface of hydric soil in the floodplain of the Tualatin River. The project would also enhance degraded wetlands on the site by modifying the hydrology by excavating a swale throughout the existing wetland area and planting native trees and shrubs. The entire mitigation site would be planted with emergent and woody vegetation to create emergent, scrub shrub, and forested wetland.

5.10.4.2 Monitoring and Maintenance of Mitigation

Monitoring and maintenance of the compensatory wetland mitigation site that is proposed for use by the HIO Parallel Runway 12L/30R Project would be the responsibility of the City of Hillsboro as agreed upon in the IGA for the mitigation project (see Appendix C.6). The Port of Portland and ODOT, as permit holders, would be responsible for ensuring that the City is monitoring and maintaining the site to satisfy any permit conditions.

5.10.4.3 Measures to Avoid and Minimize Impacts

The layout for the proposed new facilities has been carefully analyzed to avoid wetland impacts to the greatest extent possible, thereby ensuring that wetland impacts are minimized. Layouts that were analyzed consisted of various distances between the existing runway 12/30 and the proposed parallel runway, and various positions of the proposed helipad relative to the parallel runway. Wetland impacts were calculated for each layout and considered in the selection of Alternatives 2 and 3.

Impacts on wetlands would be further minimized by keeping the construction footprint as small as possible while enabling construction that meets all requirements for HIO's operation.

The construction contractor would be required to avoid and minimize unnecessary impacts on wetlands during construction. Wetlands in the vicinity of construction zones would be marked with construction fencing to ensure vehicles do not inadvertently access them. Best management practices for erosion control would be used to ensure sediment from construction does not enter wetlands or other waters.

5.11 Floodplain Impacts

This section discusses potential changes to floodplains in the study area as a result of the project.

5.11.1 Summary of Impacts

For Alternatives 1, 2, and 3, no work is proposed within the 100-year floodplain for Glencoe Swale or Dawson Creek. The stormwater runoff analysis discussed in Section 5.8, Water Quality, was used to determine that the estimated floodplain impacts for Alternatives 2 and 3 would not reach the threshold of significance as defined by FAA. Therefore, there would be no significant impacts from construction and operation within floodplains.

5.11.2 Regulatory Setting, Threshold of Significance, and Methodology

This section summarizes the federal, state, and local regulations for floodplains that could be affected by development at HIO, and describes the threshold used to define significant impacts to floodplains and the methodology used to assess impacts to floodplains.

5.11.2.1 Applicable Regulations and Standards

Floodplains are regulated under several federal statutes including:

- National Flood Insurance Act (1968)
- Flood Disaster Protection Act (1973)
- Executive Order 11988, Floodplain Management (1977)

National Flood Insurance Reform Act (1994)

The requirements for these acts are codified in Chapter 44 of the Code of Federal Regulations (44 CFR). The minimum standards for floodplain regulation are codified in 44 CFR; however, local agencies can establish more stringent requirements.

Local communities comply voluntarily with the aforementioned federal acts and CFRs. Washington County is the designated floodplain management agency for Hillsboro and the Hillsboro Airport. Section 421 of Article IV of the Washington County Development Code regulates floodplain area development. Clean Water Services (CWS) of Washington County, a special district responsible for stormwater management, has additional regulations for development activities within regulatory floodplains in their Design and Construction Standards, Section 5.10. Section 5.10 and Section 421 of Article IV of the Washington County Development Code require that development within floodplains result in no rise in the regulatory (100-year) floodplain, unless allowed by approved local plans or federal, state and local permits.

5.11.2.2 Threshold of Significance

Based on FAA Order 1050.1E, Change 1, Appendix A, Section 9.3, a significant impact on floodplains would occur if the proposed action resulted in "notable adverse effects on natural and beneficial floodplain values."

5.11.2.3 Methodology

As discussed in Section 5.8, Water Quality, either Alternative 2 or 3 would result in a 42 percent increase in impervious area draining to Glencoe Swale and less than a 1 percent increase in the impervious area draining to Dawson Creek. The project's effects on Dawson Creek would be negligible, and therefore the floodplain analysis concentrated on the Glencoe Swale system. Impacts on the Glencoe Swale floodplain were assessed using CWS' latest hydrologic and hydraulic model of Glencoe Swale.

CWS has initiated a floodplain re-evaluation of the area, called the Watershed 2000 Project. The re-evaluation is currently under review by FEMA for approval to redefine the regulatory floodplains for incorporated Washington County. CWS's Watershed 2000 hydraulic models (HEC-RAS models) were used to determine project-related floodplain impacts. Since no development is proposed in the regulatory floodplain, potential secondary impacts to the floodplain were considered. The additional flow from the proposed project impervious area was added to the existing flow in Glencoe Swale to determine if it would result in a measurable increase in water surface elevation. This approach is conservative since some future land development (additional impervious area) is already incorporated into the CWS Watershed 2000 models.

5.11.3 Environmental Impacts of Alternatives

This section discusses the expected impacts on the floodplains for Glencoe Swale and Dawson Creek from the three alternatives. The existing regulated floodplains in the HIO area are shown in Exhibit 4-5.

5.11.3.1 Alternative 1 - No Action

The No Action Alternative would not entail acquisitions or further physical development. No development would occur in designated floodplains. The No Action Alternative would not alter the extent of existing floodplains.

5.11.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts associated with Alternative 2 compared to the No Action Alternative during construction and operation. No significant impact on floodplains would occur from Alternative 2.

Construction Impacts

Construction of Alternative 2 would not impact regulated floodplains.

Operational Impacts

The proposed parallel runway 12L/30R, Taxiway D, and the relocated Charlie Helipad Option A would all be located outside the 100-year floodplain for Glencoe Swale or Dawson Creek. Therefore, there would be no impacts from development of this project on floodplains.

This alternative would create a 42 percent increase in impervious area draining to Glencoe Swale. The 100-year flow from the Airport to Glencoe Swale would increase to 59.29 cubic feet per second (cfs) from 49.45 cfs, a 9.84-cfs increase. The direct impact on the Glencoe Swale floodplain would be a 10-cfs increase in flow to the swale, a 4 percent increase. The increased flow is within the modeling margin of error and the change to the 100-year floodplain in Glencoe Swale is not measurable.

5.11.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts associated with Alternative 3 compared to the No Action Alternative during construction and operation. No significant impact on floodplains would occur from Alternative 3.

Construction Impacts

The construction impacts for Alternative 3 would be the same as for Alternative 2.

Operational Impacts

The impacts of Alternative 3 would be the same as discussed for Alternative 2.

5.11.4 Mitigation and Measures to Avoid and Minimize Impacts

No significant impact on floodplains would occur from Alternative 2 or 3; therefore no mitigation is required.

5.12 Hazardous Materials, Pollution Prevention, and Solid Waste

This section describes the consequences of implementing Alternative 2 or Alternative 3 (the project alternatives) with respect to hazardous materials, pollution prevention, and solid waste.

5.12.1 Summary of Impacts

No significant impacts related to hazardous materials, pollution prevention, or solid waste were identified for Alternative 1, Alternative 2 or Alternative 3. No contaminated sites were identified inside the area to be disturbed for the proposed project alternatives. Alternative 1, Alternative 2, or Alternative 3 would not affect any known contaminated soil; however, it is possible contaminated media from unknown sources could be encountered during construction. In the event of such a discovery, or a release of hazardous materials during construction, necessary corrective actions and reporting requirements would be implemented. The facilities constructed in either Alternative 2 or Alternative 3 would not increase the number of Airport users compared to the No Action Alternative, therefore neither of these alternatives are anticipated to generate hazardous or toxic wastes.

The Airport generates municipal type solid waste and other nonhazardous wastes associated with the operation and maintenance of general aviation aircraft. The Port of Portland's waste management system separates waste streams so that materials that can be recycled are captured and remaining materials are properly disposed. The facilities constructed in Alternative 2 or 3 would not increase the number of Airport users compared to the No Action Alternative, therefore, a substantial increase in solid waste generation once construction is completed is not expected.

Various non-hazardous solid wastes would be generated during demolition and construction of the project. The concrete, asphalt, soil, and other wastes would be segregated and recycled or reused when possible. For example, clean soil would be used as fill, if appropriate. Solid waste generation from the construction activities is not anticipated to exceed 50 cubic yards of material.

5.12.2 Hazardous Materials

This section describes the consequences of implementing the alternatives under consideration with respect to hazardous materials. A hazardous material is any substance or material that has been determined to be capable of posing an unreasonable risk to human health, safety, and property when transported in commerce (49 CFR 172 Table 172.101). These materials include hazardous wastes as described in 40 CFR 261 and hazardous substances which are identified as any element, compound, mixture, solution, or substance once released into the environment, may pose substantial harm to human health or the environment as well as those defined as a hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and listed in 40 CFR 302 (FAA 1050.1E).

5.12.2.1 Regulatory Setting, Threshold of Significance, and Methodology

Hazardous materials are defined and regulated by federal, state, and local agencies. The following subsections provide background on applicable regulations and agency requirements as outlined in FAA Order 1050.1E, Change 1, Appendix A, Section 10.

Applicable Regulations and Standards

Hazardous materials are identified and regulated at the federal level by the EPA. For properties located within the boundaries of the state of Oregon, the EPA has delegated the implementation of the hazardous materials regulations to the Oregon Department of Environmental Quality (DEQ). Even though EPA has delegated these responsibilities to DEQ, EPA maintains final authority on regulating hazardous materials. Therefore, the project site is subject to both federal and state regulations.

Applicable federal regulations controlling the use, storage, handling, and disposal of hazardous materials include the following:

- Comprehensive Environmental Response Compensation and Liability Act
- Resource Conservation and Recovery Act (RCRA)
- Superfund Amendments and Reauthorization Act
- Toxic Substances Control Act
- Community Environmental Response Facilitation Act
- Oil Pollution Act
- Pollution Prevention Act

Hazardous substances, as defined by DEQ rules (Oregon Administrative Rule [OAR] Chapter 340, Division 101) are:

- Substances defined as hazardous substances in Section 101(14) of the federal Comprehensive Environmental Response, Compensation, and Liability Act. Typical hazardous substances are petroleum hydrocarbons, selected volatile organic compounds, select inorganics, pesticides, and polycyclic aromatic hydrocarbons (PAHs). Appendix C.7 provides a list of these substances.
- The State of Oregon has classified additional materials as hazardous waste that may not be classified as hazardous waste under federal regulations. These constituents, identified in OAR 340-101-033 as state-only hazardous wastes are defined as any residue including but not limited to manufacturing process wastes and unused chemicals that has either a three percent or greater concentration of any substance or mixture of substances listed in 40 CFR 261.33(e) or a ten percent or greater concentration of any substance or mixture of substances listed in 40 CFR 261.33(f) or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of either of the above stated residues or mixtures. The exceptions to this designation are defined as mixtures of pesticides identified in OAR 340-101-033 section 2 that are listed in both 40 CFR 261.33(e) and (f) as well as those substances or mixtures of substances with individual constituents only listed in both 40 CFR 261.24 Table 1 and 40 CFR 261.33(e) and (f) as well as Dichlorodifluoro-methane and Trichloromonofluoromethane when they are intended to be recycled.
- Oil, including gasoline, fuel oil, diesel, lubricating oil, or other petroleum products
Threshold of Significance

As defined in FAA Order 1050.1E, Change 1, Appendix A, Section 10.3b, a significant impact could occur if:

- The action involves a property on or eligible for the National Priorities List.
- The sponsor would have difficulty meeting applicable local, state, or federal laws and regulations on hazardous materials.
- There is an unresolved issue regarding hazardous materials.

Methodology

The primary study area for hazardous materials reflected the boundaries of lands that would be disturbed by construction of the proposed project. The environmental review in this area focused on real properties that may contain contaminated soil or groundwater. The property in the study area is currently mowed grass airfield safety areas and other cleared areas on the Airport that are currently used for agriculture.

A second study area was selected to consider lands within an approximately 0.5-mile radius of the construction disturbance area. This secondary area was investigated to identify contaminated groundwater plumes that have been documented in the records reviewed for this project and that could be affected by construction activities such as dewatering. If construction of Alternative 2 or 3 involves aggressive dewatering, it might affect the hydraulic gradient of groundwater in the area, changing the direction or rate of migration of any contaminant plumes present.

Port of Portland files and various databases of historical or regulatory agency information were reviewed for current or historical recorded contaminated sites within the primary and secondary study areas, which includes Airport and non-Airport properties. A recorded contaminated site may contain soil and/or groundwater that is contaminated with hazardous materials, referred to in this report as "contaminated media." Recorded contaminated sites in and around HIO are identified in Table 4-3 and shown in Exhibit 4-8.

Results of searches of the following databases are included in Appendix C.7:

- Environmental Data Report for Hillsboro Airport by Environmental Data Resources, Inc. (EDR)
- DEQ's Environmental Cleanup Site Information database (DEQ, 2008)
- Historical aerial photographs
- Certified Sanborn® map report
- Environmental reports provided by the Port of Portland

5.12.2.2 Environmental Impacts of Alternatives

This section discusses the potential environmental impacts associated with the three alternatives under analysis with respect to hazardous materials.

Alternative 1 - No Action

Under the No Action Alternative the Port would continue to manage hazardous materials through its existing Spill Response Plan and continue use of the existing best management practices.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the potential hazardous material impacts associated with Alternative 2 compared to the No Action Alternative during construction and operation. No significant impacts related to hazardous materials were identified for Alternative 2.

Construction Impacts

Review of environmental files (see Appendix C.7, Attachment A) indicated that there were no sites listed on EPA's National Priorities List and no RCRA Solid Waste Management Units found within the area that would be disturbed by construction activity associated with Alternative 2.

Groundwater at HIO is relatively shallow, ranging in depth from 5 to 15 feet below ground surface depending on the property's elevation and the time of year. Section 5.12.2.3 discusses best management practices to address encountering contaminated groundwater during construction.

Construction crews would probably bring hazardous materials onsite to construct the proposed runway and Charlie Helipad. These hazardous materials could include fuel, cleaning solvents, paints, and raw materials (cement, heavy metals, etc.). Proper handling, storage, and disposal of these materials, as specified in the Port's bid specifications, would avoid adverse effects on the environment.

Operational Impacts

Alternative 2 would require the Port to modify and expand the Spill Response Plano address the increased area of potential spills and releases of hazardous materials; however, continuation of the existing best management practices would adequately address situations that may arise.

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the potential hazardous material impacts associated with Alternative 3 compared to the No Action Alternative during construction and operation. No significant impacts related to hazardous materials were identified for Alternative 3.

Construction Impacts

The construction impacts of Alternative 3 would be the same as those discussed for Alternative 2.

Operational Impacts

The impacts of operating Alternative 3 would be the same as those discussed for Alternative 2.

5.12.2.3 Mitigation and Measures to Avoid and Minimize Impacts

No significant impacts related to hazardous materials were identified for Alternative 2 or Alternative 3; therefore, no mitigation is required.

Best management practices (BMPs) would be incorporated in the Port's bid specifications to avoid and minimize impacts during construction and operation of Alternative 2 or 3. Potential BMPs may include but are not limited to:

- If the Contractor encounters suspected hazardous or environmentally sensitive conditions in the work area beyond those mentioned in these specifications or the drawings, the Contractor shall immediately stop all work in the area of the suspected contamination and notify the Port.
- The Port will make arrangements for testing and appropriate abatement, if required.
- The Contractor shall alert employees to the conditions and assure that no operations occur that disturb the suspected hazardous or environmentally sensitive condition.
- The Contractor will ensure that all staff and work crews are properly trained.

All necessary corrective actions and reporting requirements would be fulfilled if previously unknown contaminants were discovered during construction or a spill occurred during construction or operation of Alternative 2 or 3.

5.12.3 Pollution Prevention

This section describes the consequences of implementing the alternatives under consideration with respect to pollution prevention. The Port maintains an aggressive pollution prevention program, by continuing to examine ways to reduce the use of potential pollutants at the airfield and implementing best management practices for the storage, handling and disposal of these materials.

5.12.3.1 Regulatory Setting, Threshold of Significance, and Methodology

According to FAA Order 1050.1E, Change 1, Appendix A, Section 10.1, federal agencies are to comply with applicable pollution control standards in prevention, control and abatement of environmental pollution. The Port's activities and efforts to address pollution prevention at the Hillsboro Airport and the potential impacts the proposed expansion project could impose on these efforts are discussed below.

Applicable Regulations and Standards

Executive Order 12088, Federal Compliance with Pollution Control Standards, directs federal agencies to "comply with applicable pollution control standards in the prevention, control and abatement of environmental pollution; and consult with the EPA, state, interstate and local agencies concerning the best techniques and methods available for prevention, control and abatement of environmental pollution."

Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A.11 does not identify a threshold of significance for pollution prevention.

Methodology

The Port's pollution prevention program at the Hillsboro Airport was evaluated to identify potential impacts that Alternative 2 or 3 could impose on those activities. This review was based on project design information, standard Port best management practices (BMPs) and disposal

methods, as well as standard Port maintenance activities (Roy Weedman, Port of Portland, personal communication, 2008).

5.12.3.2 Environmental Impacts of Alternatives

This section discusses the potential environmental impacts associated with the three alternatives under analysis with respect to pollution prevention.

Alternative 1 - No Action

The Airport's stormwater management system will continue to accommodate stormwater runoff and would continue to meet water quality standards as defined by the Airport's Pollutant Discharge Elimination System (NPDES) 1200-Z permit.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the potential pollution prevention impacts associated with Alternative 2 compared to the No Action Alternative during construction and operation. No impacts related to the Port's pollution prevention program were identified for Alternative 2.

Construction Impacts

Construction crews may bring hazardous materials onsite to construct the proposed runway, taxiways and Charlie Helipad. Construction of the projects proposed in this alternative would require more such materials onsite than would be required for the No Action Alternative. In addition, Alternative 2 would require a large area of soil to be exposed, which would greatly increase the potential of soil erosion and increased turbidity in stormwater leaving the site. Construction impacts associated with Alternative 2 would be temporary, and proper handling, storage, and disposal of these materials, as specified in the Port's bid specifications, would avoid adverse effects on the environment.

Operational Impacts

Alternative 2 would require the Port to modify and expand its stormwater management system for new impervious surface, under their National Pollutant Discharge Elimination System (NPDES) 1200-Z permit; however, the expected increase in runoff would not increase the downstream concentration of potential pollutants (see Section 5.8, Water Quality).

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the potential pollution prevention impacts associated with Alternative 3 compared to the No Action Alternative during construction and operation. No impacts related to the Port's pollution prevention program were identified for Alternative 3.

Construction Impacts

The construction impacts of Alternative 3 would be the same as those discussed for Alternative 2.

Operational Impacts

The impacts of operating Alternative 3 would be the same as those discussed for Alternative 2.

5.12.3.3 Mitigation and Measures to Avoid and Minimize Impacts

No significant impacts related to pollution prevention were identified for Alternative 2 or Alternative 3; therefore, no mitigation is required.

Best management practices (BMPs) would be incorporated in the Port's bid specifications to avoid and minimize impacts during construction and operation of Alternative 2 or 3. Potential BMPs may include but are not limited to:

- Implementing appropriate stormwater management and erosion control measures, and
- Ensuring all staff and work crews are properly trained.

All necessary stormwater permits and reporting requirements would be fulfilled prior to the commencement of construction activities or operation of Alternative 2 or 3.

5.12.4 Solid Waste

This section describes the consequences of implementing the three alternatives under consideration with respect to solid waste. Solid waste can be defined as garbage, refuse, sludges, wastes, and other discarded materials resulting from residential and non-industrial operations and activities. In this section, solid waste excludes hazardous wastes.

5.12.4.1 Regulatory Setting, Threshold of Significance, and Methodology

The following subsections provide background on applicable regulations and agency requirements as outlined in FAA Order 1050.1E, Change 1, Appendix A.10.

Applicable Regulations and Standards

Applicable federal regulations controlling the use storage, handling, and disposal of solid waste include the following:

- Solid Waste Disposal Act
- 40 CFR, Part 258.10, Solid Wastes-Airport Safety
- FAA AC150/5200-33B, Hazardous Wildlife Attractants on or near Airports (FAA, 2007b)

Threshold of Significance

FAA Order 1050.1E, Change 1, Appendix A., Section 10 does not identify a threshold of significance for solid waste.

The FAA *Desk Reference for Airport Actions* (FAA, 2007a) provides supplemental guidance on solid waste impacts and states that a significant impact related to disposal of solid waste could occur if project-generated solid waste would exceed available landfill or incineration capacities; require extraordinary effort to meet applicable solid waste permit conditions or regulations; or if local, state, or federal agencies determined that substantial unresolved waste disposal issues exist that may require more analysis.

Methodology

The Port's operations and solid waste management program at the Hillsboro Airport was evaluated to identify potential impacts that Alternative 2 or 3 could impose on those activities. This review was based on project design information, standard Port best management practices (BMPs) and disposal methods, as well as standard Port maintenance activities (Roy Weedman, Port of Portland, personal communication, 2008). Projected waste streams produced by HIO after implementing Alternative 2 or 3 were also estimated using this information. Information on projected waste during construction was obtained from preliminary design staff.

5.12.4.2 Environmental Impacts of Alternatives

This section discusses the potential environmental impacts associated with the three alternatives under analysis with respect to solid waste generation.

Alternative 1 - No Action

Under the No Action Alternative, solid waste could increase slightly due to maintenance of the Taxiway C Extension additional pavement. Solid waste related to this additional pavement would include material from storm drain filters and light tubes from taxiway lighting. Table 5.12-1 shows the projected waste streams for this alternative.

TABLE 5.12-1

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Waste Stream	Alternative 1 - No Action	Alternative 2	Alternative 3	
Storm drain filters/catch basin cleanout	30 pounds	36 pounds	36 pounds	
Municipal solid waste	21 tons	21 tons	21 tons	
Spent absorbents	96 pounds	100 pounds	100 pounds	
Light tubes	94 lamps	113 lamps	113 lamps	
Used batteries	38 pounds	38 pounds	38 pounds	
Aerosol cans	70 cans	70 cans	70 cans	
Oily sludge	110 pounds	110 pounds	110 pounds	

Note: All amounts are based on past practices and projected alternative impacts.

Source: Roy Weedman, Port of Portland, personal communication, 2008.

Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the potential solid waste impacts associated with Alternative 2 compared to the No Action Alternative during construction and operation. No significant impacts related to solid waste were identified for Alternative 2.

Construction Impacts

A temporary increase of waste generation would occur related to construction and demolition activities associated with construction of the proposed runway, taxiways, and helipad; however, this increase would be of short duration and would not likely be a large volume. Various nonhazardous solid wastes would be generated during demolition and construction of the project. The concrete, asphalt, soil, and other wastes would be segregated and recycled or reused when possible. For example, clean soil would be used as fill, if appropriate. Solid waste generation from the construction activities is not anticipated to exceed 50 cubic yards of material. This estimated volume is well within the capacities of the local disposal facilities (Waste Management, 2009).

Operational Impacts

Operation of this alternative would not increase air traffic at the airfield compared to the No Action Alternative and would not, therefore, lead to a significant increase in solid waste generation. Some changes in solid waste would occur related to additional maintenance activities for storm drains and lighting, and potential waste from spills. Additional pavement cleaning waste, storm filters, and light tubes would be generated. Other waste related directly to the number of aircraft operations would not increase. Table 5.12-1 shows projected waste

generation increases for each alternative. Used oil is not included because it is all recycled onsite. These increases are not considered significant and there is adequate space at existing regional facilities to accept these quantities.

Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the potential solid waste impacts associated with Alternative 3 compared to the No Action Alternative during construction and operation. No significant impacts related to solid waste were identified for Alternative 3.

Construction Impacts

The construction impacts of Alternative 3 would be the same as those discussed for Alternative 2.

Operational Impacts

The impacts of operating Alternative 3 would be the same as those discussed for Alternative 2.

5.12.4.3 Mitigation and Measures to Avoid and Minimize Impacts

No significant impacts related to solid waste were identified for Alternative 2 or Alternative 3; therefore no mitigation is required. The Port has a construction waste recycling specification that sets goals for recycling construction and demolition work on Port property (see Appendix C.7).

5.13 Farmlands

This section describes the consequences of implementing Alternative 2 or 3 with respect to important farmland, as defined by the Farmland Protection Policy Act (FPPA).

5.13.1 Summary of Impacts

With respect to farmlands classified as prime, unique, or of statewide importance, as defined by the US Department of Agriculture Natural Resource Conservation Service (NRCS), approximately 50 acres of prime farmland or farmland of statewide importance would be directly or indirectly converted to non-farmland use as a result of either Alternative 2 or 3. Coordination with the NRCS under the Farmland Protection Policy Act resulted in a Farmland Conversion Impact Rating Score of 107, which is below the threshold of significance of 200.¹

5.13.2 Regulatory Setting, Thresholds of Significance, and Methodology

This section discusses the methods used to assess impacts to farmlands, the thresholds of significance for farmland impacts, and the existing condition of farmlands on Port property in Hillsboro.

5.13.2.1 Applicable Regulations and Standards

The purpose of the Farmland Protection Policy Act (FPPA) (7 U.S.C 4201-4209) is to:

...minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that Federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland.

Important farmlands monitored under the FPPA include farmland designated as prime, unique, or of statewide or local importance, as defined by the National Resource Conservation Service (NRCS). These are defined as follows:

- *Prime farmland* is "land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimal use of fuel, fertilizer, pesticides, or products."
- *Unique farmland* is defined as "land used for producing high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture necessary to produce high quality crops or high yields of them economically."
- *Farmland of statewide or local importance* is defined as "land that has been designated as 'important' by either a state government (State Secretary of Agriculture or higher office) or by county commissioners or an equivalent elected body. The State Conservationist representing the Natural Resource Conservation Service (NRCS) must agree with the designation."

These designations are based on soil types, not on actual use; therefore land may fall into one of these categories even if not actively farmed, and even if zoned for other uses. The FPPA does

¹ www.nrcs.usda.gov/programs/fppa

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not apply, however, to land already committed to urban development or water storage or to areas within U.S. Census Urban Areas. HIO is outside of the Hillsboro Urban Area for the 2000 U.S. Census.

5.13.2.2 Threshold of Significance

A significant impact would occur if the combined score on Form AD-1006 exceeded 200 and avoidance and minimization measures could not reduce the score to less than 200 (the maximum score is 260). While the FPPA does not require mitigation per se, this score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level.

5.13.2.3 Methodology

Maps provided on the NRCS website at http://websoilsurvey.nrcs.usda.gov/app/ were used to identify prime or unique farmland, or farmland of statewide or local importance, in the project area. The FPPA requires that Form AD-1006, Farmland Conversion Impact Rating, be completed by the lead federal agency for a proposed project. As directed by the FAA, the Port, as the project sponsor, fulfilled this requirement. Form AD-1006 requires the lead agency or designee to provide information on the form regarding the project and acres of impact before submitting to the NRCS. The NRCS then provides additional information to the form regarding farmland designations and uses. The form is returned to the project proponent, who calculates a "site assessment" score for the impact based on guidance provided in 7 CFR 658.5(b). The site assessment scores 12 criteria to determine which sites deserve the most protection from conversion to non-farm uses. In each of the 12 criteria a numerical value system is used to rate the factors, the higher the overall number value given the site, the more protection it will receive. The maximum individual scores are 10, 15 and 20 points, depending upon the relative importance of each criterion. The final score is used to determine whether the project would exceed the threshold of significance established by the FAA.

As an example of the methodology, the scoring process for the first criterion is as follows:

1. How much land is in non-urban use within a radius of 1.0 mile from where the project is intended?

More than 90 %:	15 points
Between 90-20%:	14 to 1 points
Less than 20%:	0 points

Within one mile of the proposed project area 44 percent of the land is non-urban land. Therefore this factor was scored with 5 points.

Table 5.13-1 includes the 12 site assessment criteria listed in Part 6 of form AD-1006. Each of these criteria was assessed for the proposed project and the corresponding score for each criterion is included in the table.

The total numerical score for the Site Assessment Criteria (48) is then added to a numerical *Relative Value of Farmland to be Converted* (59) provided by the NRCS. This number ranks the value of the farmland at HIO to regional and statewide values on a scale of 0 to 100 points. The combined project score of 107 (48 + 59) falls well below the minimum threshold of significance established by FAA at 200 points.

TABLE 5.13-1

Site Assessment Scores from Form AD-1006

Factor	Project score
1. Area in Non-urban Use	5
2. Perimeter in Non-urban use	6
3. Percent of Site Being Farmed	17
4. Protection Provided By State and Local Government	0
5. Distance from Urban Built-up Area	2
6. Distance To Urban Support Services	0
7. Size of Present Farm Unit Compared to Average	10
8. Creation of Non-farmable Farmland	3
9. Availability of Farm Support Services	5
10. On-Farm Investments	0
11. Effects of Conversion on Farm Support Services	0
12. Compatibility With Existing Agricultural Use	0
Total	48

5.13.3 Environmental Impacts of Alternatives

This section discusses the potential environmental impacts on farmlands associated with the three alternatives under analysis.

5.13.3.1 Alternative 1 – No Action

Alternative 1 would not convert existing prime farmland and farmland of statewide importance to non-agricultural uses and no impacts to farmlands would occur.

5.13.3.2 Alternative 2 – Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes impacts on farmlands that are prime, unique, or of statewide importance associated with Alternative 2 compared to the No Action Alternative during construction and operation. No significant impacts on farmlands were identified for Alternative 2.

Construction Impacts

Construction activities would not affect farmland beyond the direct or indirect conversion to non-agricultural uses as described for operational impacts.

Operational Impacts

Table 5.13-2 summarizes impacts on each soil type and farmland classification for Alternatives 2 and 3.

TABLE 5.13-2 Impacts on NRCS Farmland Classifications at HIO

	Acres Impacted by Alternatives 2 and 3			by d 3
Soil type	Classification	Direct	Indirect	Total
Amity silty loam	Prime farmland if drained	9.41	31.89	41.3
Woodburn silt loam, 3 to 7 percent slopes	All areas are prime farmland	0.33	0.70	1.03
Dayton silty loam	Farmland of statewide importance	1.89	5.79	7.68
Total Farmland Impacted ¹		11.63	38.38	50.01

Source: CH2M HILL, 2009.

¹In addition to the area of farmland impacted there are 20.34 acres of urban lands within the project area which are exempt from the FPPA for a total of 70.35 acres of project impact.

Form AD-1006, *Farmland Conversion Impact Rating*, was submitted to the NRCS as required by the FPPA. The total score for Alternative 2 is 107, well below the established level of significance of 200. A copy of this form and the site assessment protocol used to score the assessment are provided in Appendix C.8. A total of 11.6 acres of prime farmland or farmland of statewide importance would be directly converted to non-farmland uses as new impervious surfaces. The remaining impacted farmland area of 38.4 acres would be indirectly converted to non-farmland uses as graded areas within the project footprint, and would not be available for farmland uses in the future.

5.13.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on farmlands associated with Alternative 3 during construction and operation. No significant impacts on farmlands were identified for Alternative 3.

Construction Impacts

As with Alternative 2, the construction of this alternative would not affect farmland beyond that directly or indirectly converted to non-agricultural uses as described for operational impacts.

Operational Impacts

As shown in Table 5.13-1, Alternative 3 would have the same direct and indirect conversion impacts to farmlands as described above for Alternative 2, and the total Farmland Conversion Impact Rating would also be the same as Alternative 2.

5.13.4 Mitigation and Measures to Avoid and Minimize Impacts

No significant impacts related to farmland were identified for Alternative 2 or Alternative 3.

5.14 Energy Supply, Natural Resources, and Sustainable Development

The operation of aircraft and airport facilities uses energy in the form of electricity, natural gas, aviation fuel, diesel fuel, and gasoline. In addition, construction of new facilities requires consumption of additional energy and natural resources. FAA Order 1050.1E, Change 1, Appendix A, Section 13 states that

...the proposed action will be examined to identify any proposed major changes in stationary facilities or the movement of aircraft and ground vehicles that would have a measurable effect on local supplies of energy or natural resources. If there are major changes, power companies or other suppliers of energy will be contacted to determine if projected demands can be met by existing or planned source facilities.

This section describes the consequences of implementing Alternative 2 or 3 with respect to these resources, and describes efforts to incorporate sustainable construction techniques into the project.

5.14.1 Summary of Impacts

Under the No Action Alternative, delays are projected to increase from 3,321 hours in 2007 to 6,200 hours in 2010 as aircraft activity increases. Increasing delay would increase aviation fuel consumption.

Implementation of either Alternative 2 or Alternative 3 would decrease demand for energy compared to the No Action Alternative by reducing aircraft congestion and delay at the Airport. Without the proposed improvements, aircraft operating at HIO are projected to experience 7,160 hours of total delay by 2012, and 9,657 hours of delay by 2015. In contrast, Alternative 2 or 3 would reduce delays to 1,018 hours of total delay in 2012 and 1,027 hours in 2015. These delay reductions would decrease aviation fuel consumption by 103 tons (about 33,000 gallons) in 2012 and 183 tons (about 58,000 gallons) in 2015.

Under Alternative 1, traffic levels would continue to grow beyond current levels as a result of continued economic growth in the region. Operation of either Alternative 2 or 3 would not lead to increased activity at HIO compared to the No Action Alternative and would not, therefore, increase energy consumption associated with the operation of airport facilities. Operation of the new runway and associated taxiways would entail a small increase in demand for electricity to operate the taxiway and runway lights that would be used for nighttime operations and possibly during periods of low visibility.

As described in Section 5.12, Hazardous Materials, Pollution Prevention, and Solid Waste, solid waste generated during construction of Alternative 2 or 3 would be reused and recycled as appropriate. As part of its sustainability practices, the Port continues to examine ways to reduce waste generation through its waste management program, which includes waste segregation, recycling, and energy recapture programs.

5.14.2 Regulatory Setting, Threshold of Significance, and Methodology

This section describes the regulatory context for the evaluation of project-related changes in energy use and the use of natural resources, as well as the consideration of sustainable development.

5.14.2.1 Applicable Regulations and Standards

FAA Order 1050.1E, Change 1, Appendix A, Section 13 identifies the following two applicable statutes, regulations or policies:

- 1. Executive Order 13123, Greening the Government through Efficient Energy Management (64 FR 30851, June 8, 1999), encourages each Federal agency to expand the use of renewable energy within its facilities and in its activities. E.O. 13123 also requires each Federal agency to reduce petroleum use, total energy use and associated air emissions, and water consumption in its facilities.
- 2. It is also the policy of the FAA, consistent with NEPA and the CEQ regulations, to encourage the development of facilities that exemplify the highest standards of design including principles of sustainability. All elements of the transportation system should be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the traveling public. This is in keeping with section 102(2)(A) of NEPA, which requires all agencies to "...utilize a systematic interdisciplinary approach, which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking...

In addition, 40 CFR 1502.16 (e) and (f) requires federal agencies to assess each alternative's energy requirements, energy conservation, and the use of natural or consumable resources.

5.14.2.2 Threshold of Significance

In determining the significance of impacts, FAA Order 1050.1E, Change 1, Appendix A, Section 13 states:

For most actions, changes in energy demands or other natural resource consumption will not result in significant impacts. If an EA identifies problems such as demands exceeding supplies, additional analysis may be required in an EIS. Otherwise, it may be assumed that impacts are not significant.

In assessing the potential for significant impacts, this analysis considers the following factors in assessing the potential to cause demands that would exceed available or future (project year) natural resource or energy supplies:

- The action would cause a substantial demand on available energy or natural resource supplies.
- When compared to future no action conditions, changes in aircraft movements or ground vehicle use would cause a statistically significant increase in fuel consumption.
- Consumable natural resources necessary for construction are rare.

• The action would not be consistent with smart growth requirements of the agency having jurisdiction over the area where the airport is located.

5.14.2.3 Methodology and Assumptions

A discussion of the methodology and assumptions used to evaluate the effects of the alternatives with respect to the factors identified above follows.

Demand on available energy or natural resource supplies. Aviation fuel consumption would decrease with the reduction in aircraft delay, thus reducing the demand on aviation fuel supplies. Fuel consumption estimates were based on airfield delay analyses described in Appendix B2, Hillsboro Airport Airfield Capacity Update and Validation, consistent with the assumptions used in the air quality analysis documented in Section 5.8. Emissions and Dispersion Modeling System default values for fuel consumption by time in operating mode were used to calculate fuel consumption for this analysis. Although electrical power demand would increase for all of the alternatives under consideration, the evaluation of impacts for the project alternatives reflects the additional increase in demand associated with the proposed new airfield lighting. Use of other natural resources would occur during construction and are described below.

Changes in aircraft or ground vehicle movements. None of the alternatives under consideration would affect the volume of ground vehicle activity nor would any alternative alter ground vehicle movement patterns. This analysis therefore addresses only aircraft activity. The fuel burn estimates described above accounted for changes in aircraft taxi distances and delay for the alternatives under consideration.

Use of rare natural resources in construction. The cost estimates prepared for Alternatives 2 and 3 included estimates of the amount of material required for construction. These materials are listed in Appendix B.5. The analysis addresses the type and availability of building materials.

Consistency with smart growth requirements. Metro is responsible for managing the Portland metropolitan region's urban growth boundary and is required by state law to have a 20-year supply of land for future residential development inside the boundary. The state Legislature also granted Metro several specific land-use planning powers¹ including:

- Coordinating regional and local comprehensive plans in adopting a regional urban growth boundary.
- Requiring consistency of local comprehensive plans with statewide and regional planning goals.
- Planning for activities of metropolitan significance including (but not limited to) transportation, water quality, air quality, and solid waste.

The City of Hillsboro and Washington County have established land use policies consistent with the Metro Urban Growth Boundary and associated land use and development policies. Continued development of HIO as a GA reliever airport in accordance with either Alternative 2

¹ Metro urban growth boundary webpage. <u>http://www.oregonmetro.gov/index.cfm/go/by.web/id=277</u>, accessed May 12, 2009.

or Alternative 3 would comply with the land use plans and policies of both the City and the County. Consistency with local land use plans is addressed in more detail in Section 5.2.

5.14.3 Environmental Impacts of Alternatives

This section discusses the potential environmental impacts associated with the three alternatives under analysis with respect to energy supply, natural resources, and sustainable development.

5.14.3.1 Alternative 1 - No Action

The No Action Alternative would not entail acquisitions or additional physical development. Although the No Action Alternative would not lead to increased aviation activity at HIO, aviation forecasts anticipate activity levels would continue to increase over existing levels (see Section 1.3). As activity levels increase, delays are projected to increase from 3,321 hours in 2007 to 6,200 hours in 2010. This increase in total delay would increase use of aviation fuel. As noted above, this analysis assumes that demand for electrical power, heating, and cooling would also increase under this alternative relative to existing conditions as aviation activity increases over time.

5.14.3.2 Alternative 2 - Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the impacts on natural resources and energy associated with Alternative 2 compared to the No Action Alternative during construction and operation. No significant impacts on natural resources and energy were identified for Alternative 2.

Construction Impacts

Alternative 2 would require the use of building materials and the expenditure of energy during construction of the proposed facilities. The materials to be used in construction are listed in Appendix B.5 and include typical building materials such as asphalt, aggregate, drainage pipe, and electrical wiring. All of these materials are readily available in the region.

Construction of the proposed airfield improvements would also generate construction waste. The Port minimizes construction waste by recycling construction materials when it is possible to do so. As described in Section 5.12, Hazardous Materials, Pollution Prevention, and Solid Waste, solid waste generated during construction of Alternative 2 would be reused and recycled as appropriate. As part of its sustainability practices, the Port continues to examine ways to reduce waste generation through its waste management program, which includes waste segregation, recycling, and energy recapture program.

Operational Impacts

As described in Chapter 3, none of the build alternatives would induce aviation activity through the analysis period. As shown in Table 5.14-1, Alternative 2 would reduce the demand for aviation fuel compared to Alternative 1, No Action, by reducing airfield congestion and aircraft delay. Implementation of Alternative 2 would therefore have a beneficial effect in reducing consumption of aviation fuel, and would have a neutral effect on demand for most other sources of energy.

TABLE 5.14—1 Annual Aircraft Fuel Consumption by Alternative

	2007		2012		2015	
Alternatives	Tons	Gallons	Tons	Gallons	Tons	Gallons
Alternative 1, No Action	2,007	642,648	3,127	1,000,781	3,399	1,087,651
Alternatives 2 & 3, Proposed Parallel Runway 12L/30R			3,024	967,642	3,216	1,029,059
Fuel Savings of Alternatives 2 & 3			104	33,139	183	58,592

Note: Fuel includes jet fuel and aviation gasoline. Source: CH2M HILL analysis, 2009.

At present, the electrical load for runway and taxiway lighting is approximately 170.25 kilowatts (KW). The runway and taxiway lighting incorporated in the new runway would increase the airfield's demand for electrical power by about 18 percent, to 201.25 KW. Portland General Electric (PGE) provides electrical power to HIO and the surrounding area. As noted in Section 4.17, the Airport is located in an urbanizing area; population in Washington County and the region is forecast to grow at an annual rate 1.5 percent and an 534-acre tract of primarily agricultural land immediately to the north of the Airport has been added to the Portland Metro Urban Growth Boundary to help provide a 20-year industrial land supply for the Portland region. PGE will continue to increase the capacity of its facilities to accommodate increased demand, including the growth of demand at HIO.

As described in Section 5.2, the City of Hillsboro Comprehensive Plan supports the continued operation of HIO as a GA reliever airport. Implementation of this alternative would be consistent with the Airport's role and with the City's, County's, and Metro's land use plans and policies for the Hillsboro area.

5.14.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the impacts on natural resources and energy associated with Alternative 3 compared to the No Action Alternative during construction and operation. No significant impacts on natural resources and energy were identified for Alternative 3.

Construction Impacts

Construction impacts attributable to Alternative 3 are anticipated to be the same as for Alternative 2.

Operational Impacts

The operational impacts associated with Alternative 3 would be the same as those for Alternative 2.

5.14.4 Mitigation and Measures to Avoid and Minimize Impacts

No mitigation is required to reduce the impacts on energy supply and natural resources from implementing Alternative 2 or 3. However, the Port is committed to continuing its successful recycling and utilities conservation programs.

5.15 Light Emissions and Visual Impacts

This section compares the light emissions and visual effects of implementing Alternative 2 or 3 to those of the No Action Alternative. FAA Order 1050.1E, Change 1, Appendix A, Section 12.1 provides the following guidance regarding the consideration of potential light emissions and visual effects:

A description of potential impacts due to light emissions or visual impacts associated with a Federal action may be necessary. Consideration should be given to impacts on people and properties covered by section 303 (formerly, 4(f)) of the DOT Act, using guidance in section 6 of this appendix to determine section 4(f) use and significant impact.

5.15.1 Summary of Impacts

Construction of Alternatives 2 and 3 would involve development of airfield facilities. Alternatives 2 and 3 include a new parallel runway, associated taxiways, and a relocated helipad, as shown in Exhibits 3-4 and 3-5. All of these facilities would be developed on Airport property adjacent to existing airfield development. These improvements would potentially cause off-airport light emissions or materially alter the visual characteristics of the surrounding area.

Light emissions. No new approach lighting systems or other lights that affect surrounding areas are proposed. Approach lighting systems would have the potential to introduce light sources beyond the airfield itself because they extend beyond the runway end. For example, the Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting (MALSR) installed on Runway 12 extends 2,700 feet northwest of the Runway 12 threshold; or approximately 800 feet beyond Evergreen Road. Runway End Identifier Lights (REILs) are located at the runway ends and are designed to be visible from the air; accordingly, they are not directed into neighboring areas. Other on-airport lighting such as taxiway and runway lighting are used to direct pilots taxiing aircraft on the ground. These lights are designed to minimize glare, and would not affect surrounding areas.

Visual effects. The Airport has been in operation and part of the landscape since 1925. Exhibit 4-2 shows that the entire Airport is zoned for industrial use and is surrounded on three of four sides by employment (typically office park) and commercial use. Continued airport development on this site is consistent with the existing pattern of development. The northern side of the airport adjoins agricultural land uses that have been identified for urban growth. The City of Hillsboro has an intergovernmental agreement with Washington County that will extend the existing band of industrial development westward across the northern boundary of HIO. Future land use in this area will be similar to the industrial/business park development surrounding much of the Airport at present. Operation of either Alternative 2 or 3 would not alter the volume of air traffic or materially change the location of traffic patterns.

5.15.2 Regulatory Setting, Threshold of Significance, and Methodology

This section describes the regulatory context for the evaluation of project-related changes in light emissions and visual effects.

5.15.2.1 Applicable Regulations and Standards

Although FAA Order 1050.1E, Change 1 does not identify specific regulatory requirements, Appendix A, Section 12.2 provides the following guidance for the assessment of light emissions and visual impacts.

Light Emissions. The responsible FAA official considers the extent to which any lighting associated with an action will create an annoyance among people in the vicinity or interfere with their normal activities. Because of the relatively low levels of light intensity compared to background levels associated with most air navigation facilities (NAVAIDS) and other airport development actions, light emissions impacts are unlikely to have an adverse impact on human activity or the use or characteristics of the protected properties. Information will be included in the environmental document whenever the potential for annoyance exists, such as site location of lights or light systems, pertinent characteristics of the particular system and its use, and measures to lessen any annoyance, such as shielding or angular adjustments.

12.2b. *Visual Impacts*. *Visual, or aesthetic, impacts are inherently more difficult to define because of the subjectivity involved. Aesthetic impacts deal more broadly with the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable. Public involvement and consultation with appropriate Federal, State, and local agencies and tribes may help determine the extent of these impacts. The visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact. The art and science of analyzing visual impacts is continuously improving and the responsible FAA official should consider, based on scoping or other public involvement, the degree to which available tools should be used to more objectively analyze subjective responses to proposed visual changes.*

5.15.2.2 Threshold of Significance

FAA Order 1050.1E, Change 1 does not identify thresholds of significance. The *FAA Environmental Desk Reference for Airport Actions*, Chapter 16, Section 7 provides the following additional guidance on determining significance:

Light emissions. When an action's light emissions create annoyance to or interfere with normal activities.

Visual effects. When consultation with Federal, State, or local agencies, tribes, or the public shows these effects contrast with existing environments and the agencies state the effect is objectionable.

5.15.2.3 Methodology

The following factors were considered in evaluating light emissions and visual effects.

Light emissions. The evaluation of potentially intrusive light emissions examined the nature of the project with respect to new sources of light and the nature of the area that might be exposed to new light sources. New lighting sources were assumed to consist of runway and taxiway lights necessary for the safe operation of the new facilities and installed consistent with applicable FAA guidelines. No lighting is proposed for the relocated helipad. Alternatives 2 and

3 do not include approach lighting systems that have the potential to extend beyond the immediate vicinity of the proposed airfield improvements.

Visual effects. The evaluation of visual effects examined the visibility of the proposed improvements, their consistency with existing development, and the character of the surrounding area from which these improvements would be visible.

5.15.3 Environmental Impacts of Alternatives

This section discusses the potential environmental impacts associated with the three alternatives under analysis with respect to light emissions and visual impacts.

5.15.3.1 Alternative 1 – No Action Alternative

The No Action Alternative would not entail acquisition or additional physical development. The lighting and visual characteristics of the Airport will remain essentially unchanged from existing conditions. Operation of this alternative would not alter the number of aircraft operating at HIO, nor would it change aircraft traffic patterns in the vicinity.

5.15.3.2 Alternative 2 – Proposed Runway 12L/30R with Charlie Helipad Option A

This section describes the visual and light emission impacts associated with Alternative 2 compared to the No Action Alternative during construction and operation. No significant visual or light emission impacts were identified for Alternative 2.

Construction Impacts

It is anticipated that the majority of the construction work will take place during daytime hours. If any nighttime construction is required, the Port will comply with City of Hillsboro noise ordinance and seek a variance for any evening or nighttime hours (7 p.m. to 7 a.m.). The variance process would enable local residents to express any concerns they might have about intrusive lighting in the event that nighttime construction were to be proposed. Construction vehicles would be present on the site during construction, but would not be visually intrusive. The closest residence is about 550 feet from the construction site. At that distance, a piece of construction equipment 10 feet tall would occupy about 1 degree in a vertical arc, the same degree of visibility that a 2-inch-tall object would have at a distance of 10 feet.

Operational Impacts

Operational impacts on lighting and visual quality include new light sources and physical development, as well as changes in aircraft operations associated with the new infrastructure. These light emissions and visual effects are described below.

Light emissions. No new approach lighting is proposed. New taxiway and runway lights would be designed to reduce on-airport glare and would not be directed off-airport. No lighting is proposed for the relocated helipad. As shown in Exhibit 4-2, no residential land uses are immediately adjacent to HIO. The proposed new runway would be open for aircraft operations at night, as is the existing main runway. The traffic pattern for the new runway and helipad would be similar to the existing traffic patterns at HIO (see Exhibits 5 and 8 in the Runway and Flight Track Use Assumptions section of Appendix C.1). The changes associated with these improvements include:

- **Runway 12L/30R.** Aircraft on final approach to the new runway would be 700 feet to the northeast of the final approach to the existing main runway. The area under this new approach path consists of agricultural land and Airport property. The new approach path would not result in aircraft landing lights being directed into residential areas.
- **Charlie Helipad.** The relocated Charlie Helipad would be 500 feet to the northeast of the existing facility. The area under the approach path to the relocated helipad consists of agricultural land and Airport property. The new approach path would not result in aircraft landing lights being directed into residential areas.

Visual effects. No vertical structures are proposed. Given the relatively flat terrain in and around the airport, the proposed additional pavement would only be visible to observers in the immediate vicinity. The additional pavement would be similar to existing development on the Airport, and would continue to be consistent with the visual character of the area. Operation of this alternative would not alter the number of aircraft operating at HIO, nor would it substantially change aircraft traffic patterns in the vicinity. Therefore, Alternative 2 would not adversely affect the visual environment.

5.15.3.3 Alternative 3 - Proposed Runway 12L/30R with Charlie Helipad Option B

This section describes the visual and light emission impacts associated with Alternative 3 compared to the No Action Alternative during construction and operation. No significant visual or light emission impacts were identified for Alternative 3.

Construction Impacts

The construction impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

Operational Impacts

The operational impacts associated with Alternative 3 would be the same as those discussed for Alternative 2.

5.15.4 Mitigation and Measures to Avoid and Minimize Impacts

No mitigation is required to reduce the light emissions or visual impacts of implementing Alternative 2 or 3.

5.16 Summary of Impacts

Table 5.16-1 summarizes the environmental consequences of the alternatives retained for detailed consideration with respect to the resource categories in the previous sections.

TABLE 5.16-1

Summary Evaluation of Alternatives Retained for Detailed Consideration

Evaluation Criteria		Alternative 1	Alternative 2 Alternative 3			
1.	Noise	Significant levels of noise would remain on-airport through the analysis period (2015).	No significant noise impact – significant levels of noise would remain on-airport through the analysis period (2015).			
2.	Compatible Land Use	Significant noise levels would remain on-airport indicating no compatible land use impacts.				
3.	Historical, Architectural, Archaeological, and Cultural Resources	No impacts on historic, archited	ectural, archaeological, or cultural resources.			
4.	DOT Section 4(f) Impacts	No impact on DOT Section 4(f) lands.				
5.	Social and Environmental Justice	No residential or commercial relocations would occur. No significant noise exposure.				
6.	Secondary (Induced) Socioeconomic Impacts	No shifts in patterns of population movement and growth, increased demand for public services, or changes in business and economic activities.				
7. Air QualityOperational CO emissions would increase from 1,116 tons in 2007 to 1,436 tons in 2012 and 1,512 tons in 2015.Compared to Alternative 1 (No Action), CO be reduced by 19 tons in 2012 and 33 ton Construction emissions would not be sign		Action), CO emissions would and 33 tons in 2015. not be significant.				
8. Water Quality		The Airport would continue to meet water quality standards.	Drainage plans for the proposed facilities would incorporate stormwater management measures to ensure that water quality standards continue to be met. No significant impact.			
9. Fish, Wildlife and Plants		No effect on threatened or endangered species.				
		No effect on Vegetated Corridors	6.3 acres of Vegetated Corrido Jackson Bottom Wetland Pres	r would be mitigated for at erve.		
10. Wetlands		No new wetlands fill would be required.	Projects in either of these alternatives would fill 2.22 acres wetlands and would be mitigated at Jackson Bottom Wetlar Preserve.			
11	.Floodplains	No work would occur in regulated floodplains.				
12	. Hazardous Materials, Pollution Prevention, and Solid Waste	rdous rials, tion shtion, and Waste				
13.Farmlands		No conversion of farmland.	Projects in either of these alter approximately 50 acres of prim statewide importance as define	natives would affect e farmlands or farmlands of ed by the FPPA. These impacts		

TABLE 5.16-1
Summary Evaluation of Alternatives Retained for Detailed Consideration

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3	
		would not be significant.		
14.Natural Resources and Energy Supply	Use of aviation fuel would increase over current levels with forecast growth in demand and increases in congestion and delay.	Compared to the No Action Alternative, implementation of these alternatives would reduce fuel consumption by reducing delay. Construction would not require use of scarce materials. New runway and taxiway lighting would slightly increase demand for electrical power, well within the existing grid capacity.		
15. Light and Visual ImpactsNo change in lighting or visual characteristics of airport.No additional off-air airport development adjacent on-airport f		No additional off-airport lighting airport development. New development adjacent on-airport facilities.	g or lighting directed at off- elopment would be similar to	

Source: CH2M HILL and ESA analysis.