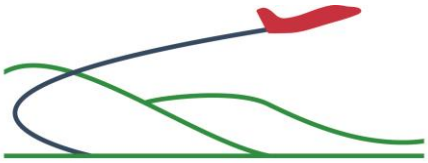
FINAL ENVIRONMENTAL ASSESSMENT

Environmental Assessment to Comply with FAA Design Standards, Meet Runway Length Requirements, Improve All-Weather Reliability, and Terminal Improvements

Pullman-Moscow Regional Airport



November 2014

Mead&Hunt

In Partnership with:

JUB Engineers, Inc.
TO Engineers, Inc.
Epic Land Solutions, Inc.
GeoEngineers, Inc.
Transect Archaeology

FINAL ENVIRONMENTAL ASSESSMENT

Environmental Assessment to Comply with FAA Design Standards, Meet Runway Length Requirements, Improve All-Weather Reliability, and Terminal Improvements

Pullman-Moscow Regional Airport

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

12/11/14

Responsible FAA Official **Date**

November 2014

Mead & Hunt

9600 NE Cascades Parkway, Suite 100
Portland, Oregon 97220

In Partnership with:

JUB Engineers, Inc.
TO Engineers, Inc.
Epic Land Solutions, Inc.
GeoEngineers, Inc.
Transect Archaeology

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment to Comply with FAA Design Standards, Meeting Runway Length Requirements, Improve All-Weather Reliability and Terminal Improvements
Pullman-Moscow Regional Airport
Pullman, Washington

Introduction

The Pullman-Moscow Regional Airport (PUW) is identified in the Federal Aviation Administration's (FAA) National Plan of Integrated Airports as a primary non-hub airport and is a FAA Part 139 certificated commercial service facility. The airport provides scheduled air carrier and general aviation services to the residents and visitors to the City of Pullman, Washington, City of Moscow, Idaho, and other nearby communities in Whitman and Latah Counties.

PUW is proposing improvements to bring the airport into compliance with FAA design standards. Currently, the airfield facilities at PUW do not meet FAA design standards for the critical design aircraft. A critical design aircraft is the most demanding aircraft, or a composite of the most demanding characteristics of several aircraft, that make substantial use of an airport (500 or more itinerant operations). The dimensional and performance characteristics of the critical design aircraft are used to determine the appropriate Airport Reference Code (ARC) and associated dimensional standards for an airport. Currently, the critical design aircraft at PUW is the C-III Bombardier Q-400; however, the Airport is still classified as an ARC B-III facility.

A Final Environmental Assessment (FEA), attached, has been prepared in accordance with FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. The purpose of the FEA is to document the evaluation of the environmental impacts associated with the Proposed Action described in the next section.

Proposed Action

The Proposed Action includes the following elements:

- Realign Runway 6/24 to meet design standards for C-III aircraft.
- Extend the realigned Runway 6/24 from 6,700-feet to 7,100-feet to accommodate existing user needs.
- Widen Runway 6/24 from 100-feet to 150-feet to meet design standards for C-III aircraft.

- Provide taxiway infrastructure to serve the realigned runway and aircraft parking areas.
- Develop revised approach and departure procedures for the realigned runway to provide capabilities for a Category I approach with ½ mile and 200 feet visibility (supported with Remote Visual Range (RVR), centerline and touchdown zone lighting).
- Provide runway and taxiway lighting for new pavement surfaces.
- Relocate or replace existing ground based navigational aids.
- Relocate or replace existing weather reporting equipment.
- Expand or relocate the existing passenger terminal.
- Acquire land through avigation easement or fee simple.

Purpose and Need

As stated above, the purpose of the project is to meet FAA design standards for the type and size of aircraft that are currently using the airport as well as those forecast to use the airport within the reasonably foreseeable timeframe. Factors contributing to the need for improvement include inadequate runway/taxiway separation, limited all-weather reliability, inadequate runway length and width. The airport currently operates under a "Modification to Design Standards" agreement, which permits commercial operations to continue at PUW conditioned upon the provision of a long-term solution to meet the required design standards. The facilities in the airport terminal do not meet existing or future passenger demand.

The Proposed Action will correct this deficiency by providing the proper runway taxiway separation, adequate runway length, improved precision to operate during inclement weather and the appropriate terminal capacity and functionality.

Alternatives

In accordance with the federal guidelines implementing the National Environmental Policy Act (NEPA), a reasonable range of alternatives was identified that may accomplish the objectives of the proposed action. These alternatives included the No Action alternative; the use of smaller aircraft, other modes of travel or telecommunications, the use of other airports; and several development alternatives.

As described in Chapter Three of the FEA, the use of smaller aircraft, other modes of travel, telecommunications and the use of other airports were eliminated from further consideration because they did not meet the purpose and need. The following development alternatives were further evaluated:

- No Action
- Improvements to the Existing Runway
- Relocation of the Runway to the South Ridgeline
- Shifting the Runway
- Runway re-alignment

- Combination of runway relocation, shifting and/or alignment

The analysis found that the No Action alternative failed to meet the purpose and need. It also determined that many of the options listed above were not feasible from an operational and/or financial perspective. Two development alternatives that involved a shift and/or shift and a rotation were further evaluated in the FEA and each of these alternatives had similar environmental impacts. In accordance with Council on Environmental Quality's 40 CFR 1502.14, the FAA is required to identify a Preferred Alternative. The preferred alternative is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. The shift of the runway with a counterclockwise re-alignment was selected as the preferred alternative because it involved significantly less earthwork and was much lower in cost.

An alternatives analysis was also conducted for the terminal improvements. Five alternatives including the No Action were evaluated. Constructing a new terminal at a new location along the realigned runway was selected as the preferred alternative.

Environmental Consequences Assessment

The *Environmental Consequences Chapter* (Chapter 5) of the attached FEA outlines the potential environmental consequences associated with the No Action and preferred alternative. The *Environmental Consequences Chapter* includes the assessment of the preferred alternative and No Action alternative for the environmental resource categories. Implementation of the preferred alternative would not significantly affect environmental resources as described in the environmental consequences summary included at the end of the *Environmental Consequences Chapter*.

The Draft EA was released to the public and interested agencies for review and comment on August 20, 2014. Two public hearings were held on September 23 and 24th in Pullman, Washington and Moscow, Idaho respectively. The comment period closed on October 6, 2014. Transcripts from the hearings and comments and responses are included in Appendix P of the FEA.

Below is a summary of findings in Chapter 5 of the FEA for the environmental resource categories.

Air Quality

The Pullman area is currently within attainment for all of the National Ambient Air Quality Standards (NAAQS) criteria pollutants. The proposed action would slightly increase fuel emissions from a small increase in taxi time and airport maintenance (i.e. snow removal) on the expanded runway, but this increase would be small and therefore a detailed air quality evaluation was not required.

The construction phase of the Proposed Action would produce a temporary increase in

air pollution through the emissions of construction vehicles and dust resulting from earth moving for the runway and terminal improvements, which would be minimized through fugitive dust Best Management Practices (BMPs). Traffic patterns are not expected to change as a result of the project; therefore vehicular traffic is not anticipated to impact air quality.

Climate

The GHG emissions at the Airport are primarily linked to fuel burn associated with aircraft operations. Because the operational level resulting from the Proposed Action would not increase over the No Action, the project is not anticipated to result in an increase in GHG emissions.

Compatible Land Use

Runway and terminal improvements associated with the Proposed Action would require the acquisition of 255.6 acres of land. Acquisition of land is necessary in order to protect the Airport approach area. The acquisition would include two residences on the northeast side of the Airport and a number of WSU agriculture-related facilities in the proposed RPZ. It would also include a 15.3 acre avigation easement for the Palouse Ridge Golf Course. All property acquisition will fully comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

Construction Impacts

The Proposed Action involves laying new pavement, relocation of navigational aids, and construction of new facilities. These activities might temporarily increase noise and dust related to construction. Construction impacts could also include increase solid waste and the potential for an increase in point source pollutant emissions. The contractor would be required to dispose of all construction waste in accordance with applicable state and federal guidelines. The contractor would also have to apply for a Stormwater Construction General Permit with Best Management Practices (BMPs) to prevent stormwater pollution and erosion.

Department of Transportation Act: Section 4(f)

The Proposed Action would not result in the direct or indirect use or constructive use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from an historic site of national, state, or local significance. Therefore, no adverse effects to Section 4(f) resources are anticipated.

Farmlands

A Farmland Conversion Rating Form (Form AD-1006) was completed for the Proposed Action. No prime or unique farmland or farmland of statewide or local importance will be affected.

Floodplains

Despite the proposed floodplain modifications with the proposed study area, the existing drainage patterns downstream of the airport would not be changed as a result of the Proposed Action. The proposed flood conveyance improvements to the project would be refined to maintain the beneficial values for the floodplain within the study area; specifically flood conveyance, flood storage volume, and hydrologic timing.

Wildlife and Vegetation

No impacts to ESA-listed or state identified wildlife or vegetation would result from the Proposed Action. A Biological Assessment (BA) was prepared and those species identified in the study area were evaluated for impacts.

Hazardous Materials, Pollution Prevention, and Solid Waste

A Phase One Environmental Site Assessment was conducted for the Proposed Action and did not identify any hazards of concern. Construction activities and equipment maintenance will be performed in a designated area and control measures to contain petroleum and other maintenance products would be used. All spills would be cleaned up immediately and the materials disposed of properly.

Solid waste generated during daily operations at the Airport would not increase as a result of the Proposed Action. There might be a temporary increase over the period of construction in the amount of solid waste due to construction-related activities, but the increase would be temporary, occurring only during construction activities, and would not overextend the capacity of any landfills in the area.

Historical, Architectural, Archeological, and Cultural Resources

Cultural resource reports were prepared for the Proposed Action study area and the wetlands mitigation site. Four cultural resources were identified as being potentially eligible for inclusion in the National Register of Historic Places within the Area of Potential Effect (APE) for the Proposed Action. No cultural resources that were eligible for the NRHP were identified within the APE for the mitigation site. The FAA consulted with the Washington Department of Archaeology and Historic Preservation for the Proposed Action in accordance with Section 106 of the National Historic Preservation Act and received concurrence with FAA's determination that there will be no adverse effect on historic properties.

Government-to-government consultation was also conducted in accordance with Executive Order 13175, Consultation and Coordination with Indian and Tribal Governments and FAA Executive Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures. FAA consulted with the Confederated Tribes of the Colville Reservation, Spokane Tribe of the Spokane Reservation, the Nez Perce Tribe, and the Coeur D'Alene Tribe of the Coeur D'Alene Reservation. Concurrence with a no adverse effect finding was received by the Nez Perce, Colville and Spokane Tribes with the condition that a monitoring plan be developed and followed during all ground disturbing activities. The FAA and the Sponsor will ensure that this condition is met.

Light Emissions and Visual Environment

The existing airfield lighting system would be replaced with runway and taxiway edge lighting, full centerline lighting, Medium Intensity Approach Lighting System With Runway End Identifier Lights and touchdown zoning lighting. Homes and businesses nearest the airport are located along Airport road. Most of these properties have views of the rolling topography. Some of these properties may have views of airport facilities but do not have direct views of the runway. Because these properties cannot directly see the runway, these properties would not incur adverse effects due to changes in lighting. If needed, light shielding techniques can be used to minimize visual effects.

Natural Resources and Energy Supply

The Proposed Action would not significantly increase the use of the natural resources or energy in the area. The materials will be locally sourced. Accordingly, there would be no significant impacts to any natural resources or the energy supply as a result of the Proposed Action.

Noise

No housing units or incompatible land uses would fall within 65 DNL noise exposure contours. Changes in noise exposure resulting from the Proposed Action would not expand the area within the 65 DNL noise contour to include any noise sensitive land uses such as residences, parks, schools, and churches resulting in a 1.5 DNL increases. Therefore, aircraft noise associated with the Proposed Action would not significantly impact noise sensitive areas.

Secondary (Induced) Impacts

The Proposed Action may result in short-term beneficial economic impacts due to construction employment but would not have a long-term impact on the social or economic environment.

Socioeconomic Environment, Environmental Justice, and Children's Environmental Health and Safety Risks

There would not be any significant changes to the socioeconomic environment as a result of the Proposed Action. The project will have no effect on population growth or local development. Local traffic patterns would remain the same. Two residents would be relocated in accordance with the Uniform Relocation Act. There would not be a disproportionate impact on low income or minority populations and since there are no schools, parks or playgrounds in the area, there would not be environmental health or safety risks for children.

Water Quality

The Proposed Action would result in a modification to the site drainage patterns, an increase of approximately 60 acres of impervious area, and additional industrial activities. Drainage conveyance systems would be designed to create an efficient stormwater network and would include water quality best management practices that will comply with local, state and federal requirements. The Proposed Action will not result in an exceedance of a water quality standard or permit conditions through the minimization and mitigation measures outlined in the FEA.

Wetlands

Runway and terminal improvements associated with the Proposed Action would result in land disturbing activities that would directly affect wetlands and streams. The Proposed Action would impact both directly and indirectly approximately 10.3 acres of riverine wetlands, 7.0 acres of sloped wetlands/ephemeral stream channels, 0.9 acres of depressional wetlands and 8,460 feet of Airport Creek. Consistent coordination has been maintained with the applicable regulatory agencies (United States Army Corps of Engineers, Washington Department of Ecology and the Washington Department of Fish and Wildlife) throughout the development of the EA. In order to mitigate the unavoidable impacts, an offsite mitigation site has been selected. The selected mitigation site is located along the South Fork of the Palouse River and is within the same watershed resource inventory area sub-basin as the Airport and encompasses approximately 120 acres. Details of the planned mitigation are included in the FEA. The site and the conceptual mitigation design have been vetted with the regulatory agencies. Section 404 and 401 of the Clean Water Act permits along with a Hydraulic Permit approval would be required for construction.

Cumulative Impacts

In order to evaluate possible cumulative impacts, research was conducted to identify projects in the past, present or reasonably foreseeable timeframe. None of the projects in concert with the Proposed Action are anticipated to result in cumulative impacts.

Connected Action: Avista Energy Corridor

The above ground Avista Energy Corridor is located south of the existing runway. In its current location the utility corridor would cross the proposed new runway at mid-field and the new parallel taxiway near the west end. The obstruction presented by an above ground utility corridor would be incompatible with the operations of a runway. Therefore, relocation of the Avista Energy Corridor was evaluated as a connected action.

Several options were developed and analyzed for the relocation of the Avista Energy Corridor. The options included routes both north and south of PUW. Both aboveground and underground options were considered due to height restrictions and compatible land use requirements in the vicinity of the Airport.

All of the Avista Energy Relocation Options discussed above would avoid crossing the proposed runway and parallel taxiway at mid-field, and thereby would reduce land use incompatibilities with the operation of the new runway. Each option was evaluated further to determine the most technically and economically feasible route for the relocated energy corridor. The South Aboveground Option was selected as the option to be carried forward for further evaluation in the Environmental Consequences Chapter of the FEA.

Minimization and Mitigation Measures

Chapter Five of the FEA outlines the proposed minimization and mitigation measures for various resources. A majority of the minimization measures include Best Management Practices during construction to minimize erosion and sedimentation. Measures will also be in place to control dust and prevent or manage hazardous materials or spills. Due to the wetland and stream impacts, a conceptual mitigation plan has been developed. The following elements are anticipated in that plan:

- The creation of approximately 8 acres of riverine wetlands;
- The enhancement and preservation of 13 acres of riverine wetlands;
- The enhancement and preservation of 1 acre of sloped wetlands;
- The enhancement and preservation of approximately 98 acres of adjacent and contiguous upland buffer areas; and
- The installation of 2 in-stream boulder clusters for fish habitat.

The plan will be included in the Joint Aquatic Resources Permit that will be submitted to the Corps of Engineers. This environmental finding is conditioned upon the issuance of that permit prior to project construction.

Finding

I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information, I find the proposed federal action is consistent with existing national environmental policies and objectives of Section 101(a) of the National Environmental Policy Act of 1969 (NEPA), and other applicable environmental requirements. I also find the proposed federal action with the required mitigation referenced above will not significantly affect the quality of the human environment or include any condition requiring any consultation pursuant to section 102(2)(C) of NEPA. As a result, the FAA will not prepare an EIS for this action.

PREPARED BY: _____ Date: 12/11/14
Cayla D. Morgan
Environmental Protection Specialist
Seattle Airports District Office

APPROVED: _____ Date: 12/11/14
Kathryn Vernon
Regional Administrator
Northwest Mountain Region

Pullman-Moscow Regional Airport

Airport Board

Glenn A. Johnson, Chair
Mayor of Pullman, Washington

Bill Lambert, Vice-Chair
Mayor of Moscow, Idaho

Jeff Hawbaker
Pullman City Council Representative

Paul Kimmell
Latah County Representative

Jon Kimberling
City of Moscow Representative

Ron Watcher
At-Large Representative

Mel Taylor
Washington State University

Ron Smith
University of Idaho

Airport Executive Director

Anthony Bean, C.M.
Executive Director

Contents

Chapter 4 Affected Environment

Chapter 5 Environmental Consequences

Chapter 6 Preparers

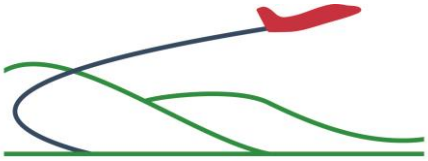
Tables

Figures

Appendices

Chapter 1 Introduction

FINAL ENVIRONMENTAL ASSESSMENT



Chapter 1 Introduction

The Pullman – Moscow Regional Airport (PUW or the "Airport") is located in Whitman County, Washington, less than five miles west of the Idaho-Washington border. The Airport is publicly owned by the City of Pullman, and is operated and sponsored jointly by the City of Pullman, Washington and the City of Moscow, Idaho. Currently, the airfield facilities at PUW do not meet Federal Aviation Administration (FAA) design standards for the critical design aircraft. A critical design aircraft is the most demanding aircraft, or a composite of the most demanding characteristics of several aircraft, that make substantial use of an airport (500 or more annual itinerant operations).[1] The dimensional and performance characteristics of the critical design aircraft are used to determine the appropriate Airport Reference Code (ARC) and associated dimensional standards for an airport.[2] Currently, the critical design aircraft at PUW is the C-III Bombardier Q-400; however, the Airport is still classified as an ARC B-III facility.

In 2006, the FAA granted a "Modification to Design Standards" agreement, which permitted commercial operations to continue at PUW, provided the Airport work toward a long-term solution to meet the required design standards. Further, a Terminal Area Plan (2013) determined that the facilities in the airport terminal do not meet existing nor future passenger demand.

The Airport, in cooperation with the FAA, the Federal lead agency, has prepared this Draft Environmental Assessment (EA) to evaluate the potential environmental effects of the proposed PUW Runway Realignment Project ("Proposed Action"). The preparation of this draft EA was triggered by the Council of Environmental Quality (CEQ) and by the requirements of the National Environmental Policy Act (NEPA) of 1969 and the FAA Orders for implementing NEPA.[3] This Draft EA was also prepared in accordance with Title V of Public Law 97-248 of the Airport and Airway Improvement Act of 1982, as amended.

This Draft EA documents the evaluation of potential impacts associated with actions proposed in this project which include:

- Realigning Runway 6/24 to meet design standards for C-III aircraft.
- Extending the realigned Runway 6/24 from 6,700 feet to 7,100 feet to accommodate existing user needs.
- Widening Runway 6/24 from 100 feet to 150 feet to meet design standards for C-III aircraft.
- Expanding or relocating the existing passenger terminal to accommodate existing and future passenger demand.

[1] According to FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, "Airport dimensional standards (such as runway length and width, separation standards, surface gradients, etc.) should be selected which are appropriate for the critical aircraft that will make substantial use of the airport in the planning period. Substantial use means either 500 or more annual itinerant operations, or scheduled commercial service. The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. The critical aircraft (or composite aircraft) is used to identify the appropriate Airport Reference Code for airport design criteria."

[2] The ARC is a coding system used to relate and compare airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport.

[3] The FAA Orders for implementing the National Environmental Policy Act (NEPA) are FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, and FAA Order 1050.1E, *Policies and Procedures for Considering Environmental Impacts*.

The Airport has prepared several planning documents over the last fifteen years that have assessed existing needs at the Airport and have examined airport facility needs for the future. This Draft EA assesses specific actions proposed in these studies, which are recommended by the Airport, along with other reasonable alternatives, including the No Action Alternative.

1.1 AIRPORT BACKGROUND

PUW is identified in the FAA's *National Plan of Integrated Airports System* (NPIAS) as a primary non-hub airport and is a Federal Aviation Regulation (FAR) Part 139 certificated commercial service facility. PUW provides scheduled air carrier and general aviation services to the residents of and visitors to the City of Pullman, Washington; the City of Moscow, Idaho; and other nearby communities in Whitman and Latah Counties.

The Airport handles an average of 80 operations per day and has 71 based aircraft. Horizon Air began offering passenger service to and from PUW in 1982. Horizon Air currently provides five flights daily of direct and one-stop service to Seattle-Tacoma International Airport (SEA) utilizing the Bombardier Q400 aircraft. The one-stop service includes a stop in Lewiston, Idaho. Due to weather-related issues, PUW experiences approximately 124 cancellations or aircraft re-routings annually, with 80% of these occurring in the winter months. The Airport also serves charters for the athletic organizations of Washington State University (WSU), the Pacific 12 Conference (Pac-12), University of Idaho (UI), the Big Sky Conference and the Sunbelt Conference. Athletic charters range from Bombardier Q400s to Boeing 737s and Airbus A319s. Of approximately 200 large turbojet charter aircraft that travel to the area annually, PUW captures approximately 40 operations, while approximately 160 operations have to be redirected to Lewiston or Spokane due to PUW's lack of all-weather reliability and insufficient runway length.

Corporate jets including multiple Citation Xs and a Citation Sovereign are based at the Airport. PUW also supports medical flights, seasonal fire suppression aircraft, and general aviation operations.

1.1.1 Airport Location

PUW is located in Whitman County, Washington near the Washington-Idaho border, approximately 75 miles south of Spokane. The Airport is four miles northeast of Pullman, Washington; and eight miles west of Moscow, Idaho (**Figure 1-1**, *Vicinity/Location Map*).

The airport lies within the Palouse region (a part of the foothills of the Clearwater Mountains) which includes portions of five Washington counties and two Idaho counties. The topography is a unique landscape characterized by rolling silt and sand, steep rock, and channeled scablands. The rocky areas of the Palouse are on the easternmost border of the region and are forested, steep-sloped and mountainous. To the east and west are buttes ranging in altitude from 2,500 to 4,000 feet. Surrounding these buttes are rolling hills.

The City of Pullman is located in Whitman County on the rolling hills of the Palouse between Lewiston, Idaho (30 minutes to the south), Spokane, Washington (90 minutes to the north), and Moscow, Idaho (10 minutes to the east). The City of Pullman is home to WSU. Since its inception in 1890, WSU has virtually defined the city's growth and development patterns. Nearly 50 percent of land within the city limits is

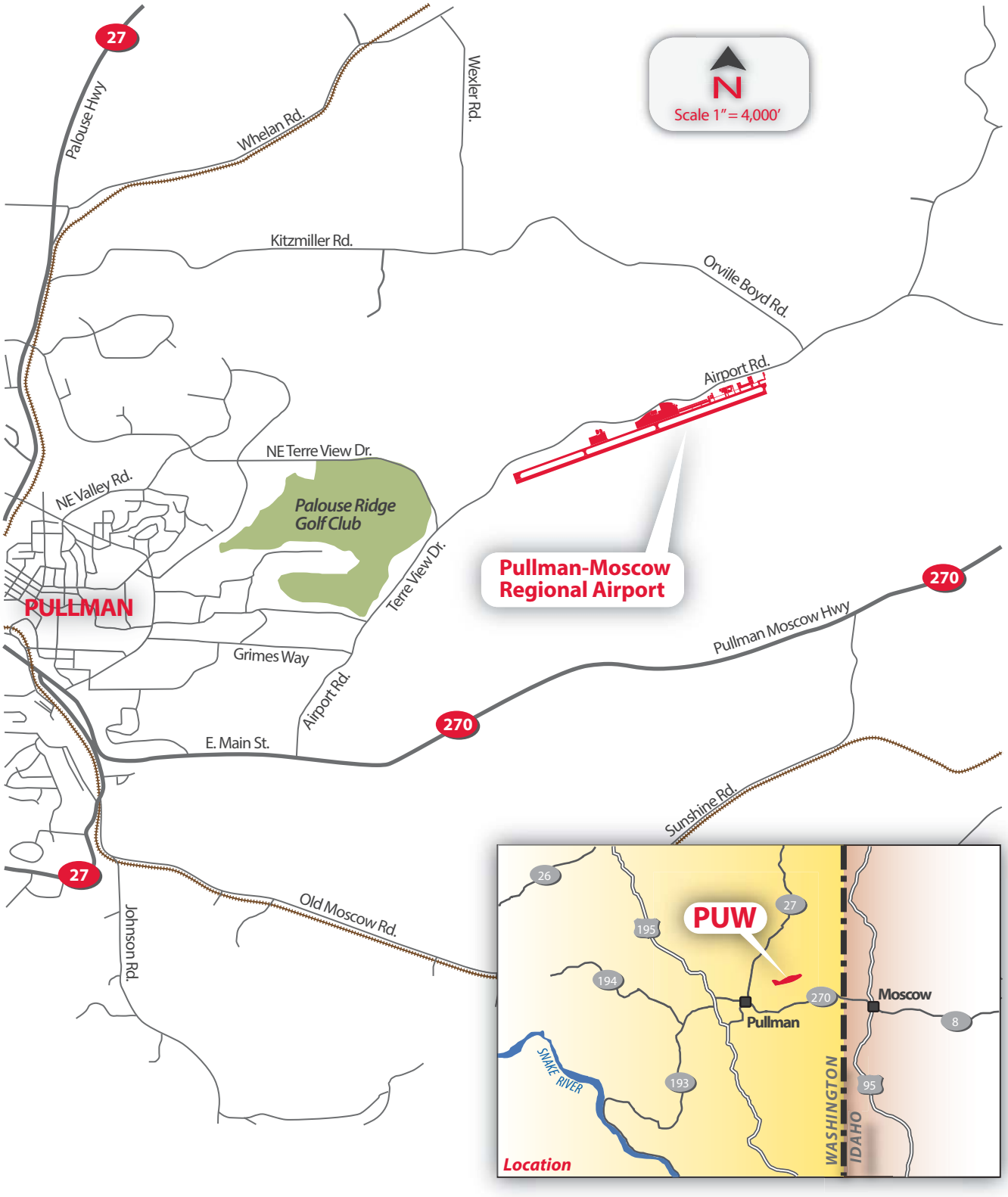


Figure 1-1 **Vicinity/Location Map**

owned or controlled by the University. WSU's student, faculty, and staff population comprises approximately 58 percent of Pullman's total population, which is approximately 30,000.

The City of Moscow, Idaho is eight miles east of Pullman in Latah County, Idaho. Moscow's population is approximately 24,080. Moscow is also a university town, home to the UI. UI students, faculty and staff comprise about 59 percent of Moscow's total population.

1.1.2 Airport Planning History

PUW and the FAA have long-recognized the non-standard conditions on the airfield resulting from the introduction of larger commercial aircraft serving the Airport. Since 1999 there have been four planning studies conducted to address the situation, and a temporary "Modification to Design Standards" from the FAA was granted in 2006. This agreement permits commercial operations to continue, provided the Airport works toward a long-term solution to meet the required design standards.

A collection of planning studies, including a Phase I and Phase II Master Plan, have been carried out to address the non-standard conditions at PUW. The plans evaluate needed facility improvements, identify preferred improvement alternatives, and establish project priorities, schedules and costs. The initial planning studies, the two Airport Master Plans, and all accompanying technical reports serve as the foundation for this Draft EA. Four of the planning documents are described briefly below. More detailed descriptions can be found in **Chapter 3, Alternatives**.

- **1999 Airport Master Plan:** The 1999 Plan addressed non-compliance with FAA design standards by identifying and comparing alternatives to accommodate larger regional jet transport aircraft and to provide all-weather aircraft landing and takeoff capabilities.
- **2004 Airport Site Investigation and Instrument Runway Designation Reports:** With the announcement that Horizon Air would switch to using larger aircraft, this study was conducted to identify alternatives for compliance with FAA airfield design geometry standards. This report concurred with the 1999 Airport Master Plan findings, but also declared a need for additional information prior to making a final determination.
- **Phase I Airport Master Plan (Completed 2007):** The primary objective of the Phase I Airport Master Plan was to independently determine the optimal runway orientation for best meeting FAA design standards. The Phase I Airport Master Plan ultimately selected a Preferred Runway Realignment Alternative.
- **Phase II Airport Master Plan (Completed 2013):** The primary focus of the Phase II study was to determine whether the runway realignment project could be built, by identifying and providing solutions to mitigate the runway realignment's challenges. The Phase II analysis revealed the preferred runway realignment has no fatal flaws that would prevent construction (**Appendix A**).

1.2 PROJECT FUNDING

The FAA is being requested to provide 90% of all project costs. The Airport would be responsible for 10% of the project cost, which is expected to come from airport revenues and Sponsor contributions. It is important to note that funding for improvements to the passenger terminal have not yet been identified; however, this component is included in Proposed Action and was analyzed for potential environmental impacts. The project may be funded through several FAA programs:

- *Airport Improvement Program (AIP):* AIP provides money called entitlement funds to airports around the country based on the airport's size and the number of passenger enplanements. The funds, which are provided for the planning and development of public-use airports, are eligible for those airports included in the National Plan of Integrated Airport Systems (NPIAS). See the FAA's AIP Handbook for a more detailed discussion on AIP grants.[4]
- *Discretionary Funds:* The FAA distributes discretionary funds for high-priority projects.
- *Passenger Facility Charges (PFC):* The Airport receives funds from PFCs and landing fees. These funds can be used for the local match requirements.

Cost estimates for the Proposed Action are included in **Chapter 3, Alternatives**.

[4] Note that language used in FAA environmental findings for funding states that a "determination that the environmental analysis prerequisites associated with any future AIP funding application have been fulfilled pursuant to 49 USC 47101." A funding decision is separate from an environmental finding on a project.

Chapter 2 Purpose and Need

FINAL ENVIRONMENTAL ASSESSMENT

Chapter 2 Purpose and Need

This chapter describes the conditions at the Airport, identifies the Purpose and Need for the Proposed Action, presents how the components of the Proposed Action will address the Purpose and Need, describes the Proposed Action and provides an anticipated timeframe for the Proposed Action.

2.1 AIRPORT INFORMATION

In order to understand the Purpose and Need of the Proposed Action, it is necessary to understand how existing conditions at the Airport support and provide rational reason for the identified improvements included in the project. The following sections explain the existing and forecasted conditions at the Pullman-Moscow Regional Airport.

2.1.1 Existing Airport Facilities

PUW is a non-towered airport and has a single east-west runway that is 6,731 feet long and 100 feet wide. The runway, currently designated Runway 6/24, was changed from 5/23 in the summer of 2012 due to changes to magnetic declination. Runway 6 has a 209 foot displaced threshold to meet 600 foot safety area standards for Category B-II aircraft, while Runway 24 has an 801 foot displaced threshold due to terrain penetrations of the approach surface. Both runways have RNAV GPS approaches, with approach minimums at 480 feet / 1 3/8 mile, which means that if an aircraft is at an altitude of 480 feet, and is 1 3/8 mile from the runway, the pilot must be able to see the runway to be able to land safely. A parallel, connecting taxiway with four aircraft holding positions is located north of the runway.

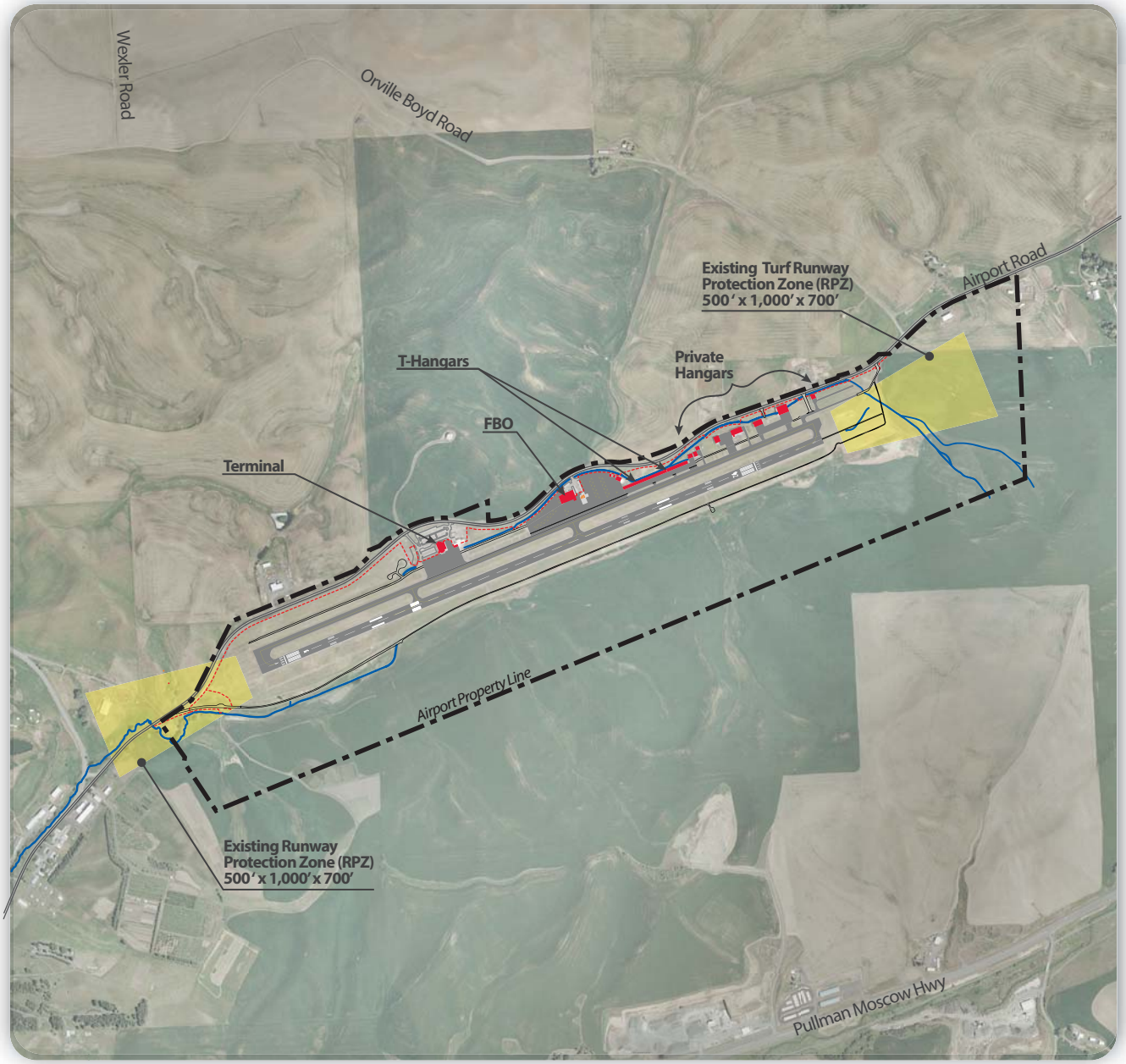
The passenger terminal building, built in 1989, is located on the north side of the runway and is 8,435 square feet in overall area. It is a one story structure with one security check point, one hold room, and two gates.

Hangars and support facilities including the Fixed Base Operator and Airport Equipment Maintenance Facility are located east of the terminal and north of the runway. The airport property south of the runway is largely undeveloped hilly terrain. A portion of the south side hills is leased farmland. A power line traverses the low-lying portion of the airport's south-side property. **Figure 2-1**, *Existing Airport Layout,* illustrates the existing airport facilities.

2.1.2 Aviation Activity Forecast

The aviation activity forecast used in this Draft EA was prepared for the 2013 Terminal Area Plan (**Appendix C**). These forecasts were utilized to evaluate the need for the proposed runway and terminal improvements, and to evaluate noise and air quality impacts associated with the Proposed Action.

For the purposes of this Draft EA, aircraft operations and passenger enplanements are the essential components of the aviation activity forecast. An operation is the act of an aircraft taking off or landing at an airport. An arrival and departure of a single aircraft is counted as two operations. Aircraft operations are categorized as scheduled commercial airline, non-scheduled charter airline, military and general aviation.



Source: *Aerial: AGIS Aerial. Basemap: Existing Airport Layout Drawing, 2011, by JUB Engineers.*

Figure 2-1 **Existing Airport Layout**

Operations are further refined as either local or itinerant. A local operation is defined as any operation performed by an aircraft that (a) operates in the local traffic pattern or within sight of the tower or airport, or (b) is known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the control tower or airport, or (c) executes a simulated instrument approach or low pass at the airport. An itinerant operation is defined as takeoff or landing operations of airplanes going from one airport to another airport that involves a trip of at least 20 miles. Passenger enplanements are defined as the number of passengers boarding an aircraft.

Aviation activity forecasts considered the most recent year of complete data available (2011), and then forecasted aviation activity for the expected opening day of the Proposed Action (2018). Additional forecasts were developed at five year increments beyond the expected opening day. Aviation activity forecasts include both commercial operations and charter flights. Because the Airport's reliability is expected to improve once the Proposed Action is constructed, both commercial and charter operations are projected to increase. To account for the expected increase in operations, a higher growth rate was applied after 2018.

Forecasting for terminal facilities uses the same data as the aviation activity forecast, but uses a different timeframe. Terminal facilities use 50-year activity forecasts during design and layout. The 50-year forecasts assume unconstrained growth at PUW, and expect that the Airport has sufficient property to construct facilities as needed to keep pace with demand. The 50-year forecasts use the same compound annual growth rates used in the aviation forecasts. Aviation activity forecasts for PUW are shown in **Table 2-1**.

Table 2-1: 50-Year Environmental Assessment Aviation Activity Forecast							
Year	**2011**	**2018**	**2023**	**2028**	**2033**	**2038**	**2061**
Annual Passenger Enplanements	39,038	52,000	90,400	101,400	144,200	155,400	504,100
Annual Aircraft Operations	29,547	32,680	35,980	38,980	43,480	47,080	77,580
Commercial Operations	4,000	4,200	4,300	4,600	6,400	6,200	11,100
-Scheduled Commercial	1,854	1,900	2,500	2,700	3,800	3,700	6,700
-Other Commercial	2,096	2,200	1,700	1,800	2,500	2,400	4,300
-Part 121 Air Charter	50	100	100	100	100	100	100
Itinerant Military	80	80	80	80	80	80	80
General Aviation	25,467	28,400	31,600	34,300	37,000	40,800	66,400
-Itinerant	13,457	16,300	19,500	22,100	24,700	28,400	53,700
-Local	12,010	12,100	12,100	12,200	12,300	12,400	12,700
Based Aircraft	71	76	79	83	88	92	132
Single-engine piston	57	59	61	63	65	67	77
Multi-engine piston	7	7	7	7	7	7	7
Turbo jet	4	5	6	7	9	12	30
Turbo prop	2	3	3	3	4	5	12
Helicopter	1	1	2	2	2	3	6

Source: 2013 Airport Master Plan Phase II, 2012 FAA TAF
Numbers may not add exactly due to rounding.

2.2 AIRFIELD DESIGN STANDARDS

In order to determine the required dimensions and facilities for PUW, it is necessary to identify the Airport's critical design aircraft, or critical aircraft, which is defined in the following excerpt. According to FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*:

> *"Airport dimensional standards (such as runway length and width, separation standards, surface gradients, etc.) should be selected which are appropriate for the critical aircraft that will make substantial use of the airport in the planning period. Substantial use means either 500 or more annual itinerant operations, or scheduled commercial service. The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. The critical aircraft (or composite aircraft) is used to identify the appropriate Airport Reference Code for airport design criteria."*

There are two critical design aircraft categories that make substantial use of the Airport. The first category includes large turboprop aircraft used for scheduled commercial service. The dimensional and performance characteristics of these aircraft are used to determine the appropriate Airport Reference Code (ARC) and associated dimensional standards for PUW. The second category includes large jet aircraft used for

general aviation and charter operations. The performance characteristics of these aircraft are used to determine the runway length requirements for the Airport's primary runway.

An airport should be designed in accordance with the ARC standards that are described in AC 150/5300-13, *Airport Design*. The ARC is a coding system used to relate and compare airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The FAA uses the critical aircraft (defined above) in order to determine design standards for airfield facilities. Design standards are determined by the approach category which is based on the aircraft speed on approach to runway and the design group which is a component of the tail height and wingspan of the critical design aircraft. Critical design aircraft classification categories are listed in **Table 2-2**

Table 2-2: Critical Design Aircraft Categories

Approach Category	**Approach Speed (knots)**	
A	Less than 91	
B	91 or greater, but less than 121	
C	121 or greater, but less than 141	
D	141 or greater, but less than 166	
E	166 or greater	
Design Group	**Tail Height (feet)**	**Wingspan (feet)**
I	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

Source: FAA AC 150/5300-13A Airport Design, Table 1-1

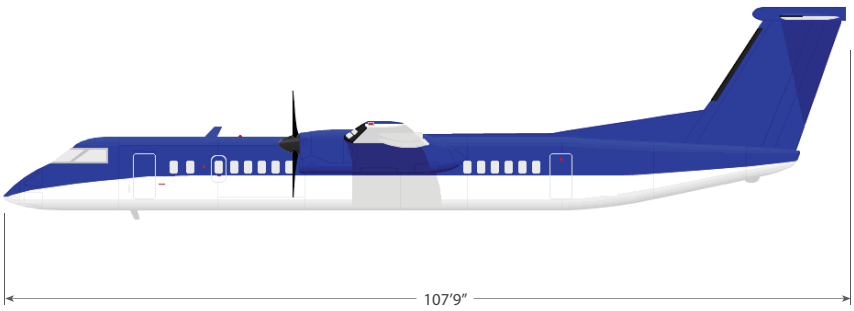
The design standards at PUW increased in dimension when Horizon Air changed aircraft from the B-II Fairchild Metroliner to the B-III Bombardier Q-200, and eventually to the C-III Bombardier Q-400 (see **Figure 2-2**, *Critical Design Aircraft*). Currently, the critical design aircraft used to determine dimensional standards at PUW is the C-III Bombardier Q-400; however, the Airport is still classified as an ARC B-III facility, and nearly all design geometry standards at the Airport are non-standard for C-III aircraft. **Table 2-3** presents existing runway conditions and compares them to B-II, B-III and C-III critical design standards. The comparison demonstrates the existing design standard conflicts and underscores the need for corrective action.

The Airport intends to bring the airfield into compliance with FAA design standards through the implementation of the Proposed Action. Meeting design standards will require modification to existing airfield facilities, including the runway and taxiway.

Fairchild Metroliner
ARC B-II
M.T.O.W. 16,500 lbs

Citation X
ARC C-II
M.T.O.W. 36,600 lbs

Bombardier Q200
ARC B-III
M.T.O.W. 36,300 lbs



Bombardier Q400
ARC C-III
M.T.O.W. 64,500 lbs

Note: Representative Aircraft not to scale.

Figure 2-2 **Critical Design Aircraft**

Table 2-3: Runway Design Standard Differences for Airport Reference Codes B-II, B-III, and C-III				
Airport Reference Code	**Existing Conditions**	**B-II**	**B-III**	**C-III**
Representative Aircraft		**Metro**	**Bombardier Q200**	**Bombardier Q400**
Period as Primary Air Carrier Aircraft		**Pre-1994**	**1994 to 2007**	**2008 to Present**
Runway Width	100 feet	75 feet	100 feet	150 feet
Is Runway 6/24 In Compliance?		*YES*	*YES*	**NO**
Shoulder Width	10 feet	10 feet	20 feet	20 feet
Is Runway 6/24 In Compliance?		*YES*	**NO**	**NO**
Blast Pad Width and Length[1]	None	95 x 150 feet	140 x 200 feet	140 x 200 feet
Is Runway 6/24 In Compliance?		**NO**	**NO**	**NO**
Runway OFZ Width and Length[1]		400 x 200 feet	400 x 200 feet	400 x 200 feet
Is Runway 6/24 In Compliance?		**NO**/YES	**NO**/YES	**NO**/YES
RSA and Length[1]		150 x 300 feet	300 x 600 feet	500 x 1,000 feet
Is Runway 6/24 In Compliance?		YES/**NO**	YES/YES[2]	YES/YES[2]
ROFA Width and Length[1]		500 x 300 feet	800 x 600 feet	800 x 1,000 feet
Is Runway 6/24 In Compliance?		*YES/YES*	**NO/NO**	**NO/NO**
Centerline to Taxiway Centerline	200 feet	240 feet	300 feet	400 feet
Is Runway 6/24 In Compliance?		**NO**	**NO**	**NO**
Centerline to Aircraft Parking Area	265 feet	250 feet	400 feet	500 feet
Is Runway 6/24 In Compliance?		*YES*	**NO**	**NO**
Centerline to Holdline	150 feet	200 feet	200 feet	250 feet
Is Runway 6/24 In Compliance?		**NO**	**NO**	**NO**
Crosswind Component	13 knots	13 knots	16 knots	16 knots
Is Runway 6/24 In Compliance?		**NO**	*YES*	*YES*
FAA Land Use Guidelines				
RPZ Dimensions	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,700 x 500 x 1,010 feet
Is Runway 6/24 In Compliance?		*YES*	*YES*	**NO**
Building Restriction Line (BRL) [3]	394 feet	495 feet	745 feet	745 feet
Is Runway 6/24 In Compliance?		**NO**	**NO**	**NO**
1. Length beyond Runway End. 2. Met with a displaced threshold				
Design standards shown are for existing approach minimums of one statute mile or greater. More demanding standards may apply if approach minimums of less than one statute mile are implemented.				
RPZ: Runway Protection Zone RSA: Runway Safety Area OFZ: Obstacle Free Zone ROFA: Runway Object Free Area				

Source: FAA AC 150/5300-13A Airport Design

2.3 RUNWAY LENGTH

The existing 6,731 foot runway length does not meet the needs of existing airport users. Some existing airport users must off-load fuel, cargo or passengers to utilize their aircraft for operations with long haul lengths. The Phase II Airport Master Plan included a runway length justification analysis for the existing aircraft fleet utilizing PUW. The analysis used a five-step procedure for determining required runway lengths at airports as described in FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design* which states that the required runway length is "the longest resulting length after any adjustments for all the critical design aircraft under evaluation."

Using this procedure, the Citation X was determined to be the critical design aircraft for runway length. Although Part 121 charter operators require the longest runway lengths of the three key user groups (General Aviation Jet Operators, Commercial Air Carriers and Part 121 Charter Operators), the charter operations do not meet the "substantial use threshold" of 500 annual itinerant operations. Using the Citation X as the critical design aircraft, the analysis recommended a runway length of 7,100 feet to accommodate the existing aircraft fleet at PUW. The FAA approved the runway length justification included in the Phase II Airport Master Plan on March 1, 2011. The full runway length justification study and FAA approval letter are included in **Appendix D**.

2.4 RUNWAY WIDTH

The existing runway width of 100 feet does not meet design standards for C-III aircraft. FAR AC 150/53-13 *Airport Design* states that for Category C-III aircraft with maximum certified takeoff weight greater than 150,000 pounds, the standard runway width is 150 feet. In addition to the C-III Bombardier Q-400, PUW has a growing number of aircraft that are equal to or greater than 150,000 pounds that conduct more than 200 operations annually, including the 737-800 aircraft (172,500 pounds) and the Airbus 319 (150,000 pounds).

2.5 PASSENGER TERMINAL

A Terminal Area Plan (TAP) was completed in 2013 to analyze the existing passenger terminal facility and its ability to accommodate existing and projected passenger demands (**Appendix C**). The TAP included an analysis of the terminal building space, passenger vehicle parking, and aircraft parking. The TAP concluded that all three components of the terminal area are deficient and should be improved to meet existing and projected aviation demand.

Annual enplanements at PUW were 38,005 in 2011 and are projected to increase at a rate of 5.82 percent over a 20-year planning period. This increase, resulting from a rise in the number of flight operations and an increase in the average aircraft size, will result in increased use of the terminal facility, and a corresponding rise in peak activity. Currently, there are undersized areas in relation to the existing and expected amount of use, and according to the TAP, the terminal building is inadequately sized to meet current facility requirements. The TAP analysis determined that more space for circulation and more seats for passengers are needed in the terminal facility (see **Table 2-4**).

Table 2-4: Existing and Projected Needs for the PUW Terminal Facility			
	Landside Parking Spaces	Seats at Terminal Facility	Area of Terminal Facility (sqft)
Existing Needs	280	62	18,882
2012 (Existing)	210	46	8,785
2018	280	65	20,880
2023	370	68	27,704
2028	545	74	29,621
2038	867	137	41,711

Source: Pullman-Moscow Regional Airport Terminal Area Plan (2013)

Passenger vehicle parking at the Airport is also insufficient. The Airport currently has 210 parking spaces, but the existing demand for parking is 280 spaces. Additionally, there is limited parking for taxis and no designated parking for charter buses. With an increase in operations for both commercial and charter aircraft, the expected demand for parking will be 867 spaces in 2038. **Table 2-4** shows existing and future demand for passenger vehicle parking at PUW.

The TAP also identified airside parking at PUW as deficient. The existing terminal apron provides space for two Q-400 aircraft, but is not large enough to provide concurrent parking of a Q-400 aircraft and a narrow-bodied aircraft (i.e. 737-800 aircraft). The TAP identified a need for more aircraft parking to accommodate future growth in operations.

2.6 PURPOSE AND NEED FOR THE PROPOSED ACTION

The intent of the Proposed Action at Pullman-Moscow Regional Airport (PUW or the "Airport") is to meet FAA design criteria for the type and size of aircraft that are currently using the Airport. Factors contributing to the need for improvement include inadequate runway/taxiway separation, limited all-weather reliability, inadequate runway length and inadequate runway width. Further, the existing passenger terminal building is inadequate to accommodate existing and future passenger demand.

The purpose of the project is to meet FAA design standards for the runway and to accommodate existing operations and forecasted growth by improving airside and terminal facilities.

The implementation of this Proposed Action will address the following needs:

- Meeting FAA design standards for the runway
- Providing adequate runway length and width to meet requirements
- Improving the ability to operate to and from the Airport during inclement weather
- Providing terminal capacity and functionality

The Proposed Action will address these needs in a comprehensive, integrated project for overall improvement of the Airport. The following sections provide a summary discussion of how the project will address the needs identified above. Each need statement is shown in ***bold italics.***

The need to meet current FAA design standards.

The introduction of larger commercial aircraft serving the Airport has resulted in the Airport becoming non-compliant with FAA design standards. Prior to 1994, PUW was served by smaller B-II turboprop aircraft with capacities in the 15- to 30-seat range. In the mid-1990s, a switch was made to the 37-seat B-III Bombardier Q200. In the late 2000s, the Q200 was replaced with the 76-seat C-III Bombardier Q400. In 2011, the Q400 conducted 1,834 operations at PUW and was determined to be the most demanding aircraft that meets the significant use threshold of 500 or more annual operations defined in FAA AC 150/5325-4B. As a result, the Q400 was identified as the critical design aircraft, which is the basis for the airfield design criteria.

While the critical design aircraft used to determine dimensional standards at PUW is the C-III Bombardier Q400, the airport facilities are still classified as ARC B-III. FAA design standards exist to promote safe and efficient use of airport facilities for all aircraft, while sizing facilities appropriately for existing and future demand. C-III design standards include separation standards, safety areas and object free areas. C-III design standards that are not met by the existing airport layout at PUW are presented in **Table 2-5.**

Table 2-5: Design Standards Not Meeting C-III Criteria at PUW

Design Standard	ARC B-III (Existing Condition)	ARC C-III Standard
Runway-Taxiway Centerline Separation	200 feet	400 feet
Runway Centerline to Aircraft Parking	265 feet	500 feet
Runway Centerline to Taxiway Holdline	150 feet	250 feet
Runway Width	100 feet	150 feet
ROFA Width and Length[1]	800 X 600 feet (Not Clear & Graded)	800 x 1,000 feet
ROFZ Width and Length[1]	400 X 200 feet (Not Clear)	400 x 200 feet
Runway Blast Pad Width and Length[1]	None	140 x 200 feet
Runway Shoulder Width	10 feet	25 feet

[1] *Length Beyond Runway End*

Source: 2012 Master Plan, AC 150/5300-13A

The runway safety area (RSA) meets C-III standards through the use of displaced thresholds and declared distances. Displaced thresholds and declared distances are methods to limit the use of existing pavement for take-off and landing. This results in usable runway lengths that are shorter than the physical length of the pavement. The Phase II Airport Master Plan recommended that PUW provide standard RSAs without requiring displaced thresholds or declared distances if possible.

Several planning studies related to airside development alternatives to achieve C-III design geometry standards have been completed at PUW. These studies built on one another and eventually resulted in the Proposed Action presented in this Draft EA. The improvements described in the Proposed Action would allow PUW to meet FAA design standards, which are established to provide for aviation safety and efficiency.

The need to meet runway length requirements.

The FAA Modification to Design Standards that was granted to the Airport in 2006 allowed PUW to operate with the existing, yet non-compliant, airfield configuration. One of the operational inefficiencies of the airfield is that the usable runway length does not meet the requirements of some existing users.

Utilizing the five-step procedure for determining required runway lengths at airports described in FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design,* the three key user groups at PUW (General Aviation (GA) Jet Operators, Commercial Air Carriers, and Part 121 Charter Operators) were analyzed to determine the required runway length for PUW. The study found that the runway length requirement for the *Large Aircraft with a Maximum Take-Off Weight up to and including 60,000 Pounds* utilized by GA Jet Operators is 7,100 feet, while the runway length requirement for the Bombardier Q400 aircraft utilized by commercial air carriers is 6,600 feet. Because 7,100 feet is "the longest resulting length after any adjustments for all the critical design aircraft under evaluation"[1] whose annual itinerant operations exceed the substantial use criterion, this length was identified as the most suitable for the airport runway.

By extending the runway to 7,100 feet, as described in the Proposed Action, the Airport is able to meet the FAA recommended runway length requirements as described in the PUW Phase II Airport Master Plan. An additional benefit of meeting these runway length requirements is that aircraft can take off with higher payload and fly nonstop to further destinations.

The need to improve the ability of aircraft to land and/or take off during inclement weather conditions.

Weather conditions specific to an airport not only influence the layout of the airfield, but also impact the use of the runway system. Variations in weather resulting in limited cloud ceilings and reduced visibility typically lower airfield capacity, while changes in wind direction and velocity typically dictate runway usage and influence runway capacity and delay.

Operating conditions at PUW can be affected by inclement weather in every season, but it is most common during the winter season when weather-related cancellations, delays, and re-routings are at their peak. Most aircraft are capable of operating into and out of the Airport during visual conditions. In inclement weather, however, instrument meteorological conditions (IMC) can be required. These instrument procedures allow aircraft to maintain adequate clearances from the surrounding terrain, even when visibility is low. Some aircraft are unable to operate in IMC and are either delayed or diverted to other airports during

[1] FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design.* AC 150/5325-4B

IMC. As a result, demand shifts to other airports either in anticipation of or as a result of weather-related impacts to operations.

Runway 6/24 currently has three instrument approach procedures (approaches) to assist pilots during IMC. Two of these approaches provide guidance to Runway End 6, and one provides guidance to Runway End 24. The three approaches have higher visibility minimums and decision heights than most approaches at commercial service airports. This means that compared to most approaches, a pilot must be able to see the runway from a greater distance and greater altitude in order to land. These high minimums and decision heights are due to the topographical relief or rising terrain to the north, south, and east of the Airport. These visibility minimums and decision heights reduce the reliability of PUW's airfield, especially during the winter months when IMC are more frequent.

The potential for future reductions in approach visibility minimums were considered in the design of the Proposed Action. By realigning the runway, as described in the Proposed Action, the Airport would increase its all-weather reliability by reducing or eliminating obstructions and would reduce the existing approach procedure weather minimums. The benefit of increasing the all-weather reliability of the Airport is a reduction in the number of day/hours that the Airport is closed to commercial and general aviation traffic due to inclement weather.

The need to construct terminal improvements to accommodate existing and future passenger demand.

Facility requirements for a passenger terminal building are based on the number of people and aircraft it is expected to serve. While they are not required in a statutory sense, they are needed to provide an adequate level of service to meet passenger demand. The terminal facility at PUW was built in 1989, when the Airport served approximately 28,910 passengers. In 2011 PUW served approximately 79,441 passengers. The airport is projected to serve approximately 292,900 passengers in 2033.

A *Terminal Area Plan,* completed in 2013, determined that the existing 8,435 square foot terminal facility at the Airport does not adequately accommodate existing passenger demand, and will not accommodate future passenger demand. Several spaces are oversized for current needs, while others are greatly undersized. As passenger enplanement numbers continue to grow, there will be increased pressure on facility performance.

In addition to the need for a larger terminal building, an increase in vehicle parking, bus parking and access roads are needed. The airport currently provides 210 parking spaces. The existing demand is 280 parking spaces with a need for 588 spaces by 2033. The existing terminal apron provides parking for two Q-400 aircraft, and does not allow for simultaneous parking of Q-400 and a narrow body jet (737-800 aircraft). The *Terminal Area Plan* identified a need to provide one additional aircraft parking position in the near term with two additional parking positions by 2033.

Improvements to the terminal facility included in the Proposed Action would allow PUW to meet both existing and future passenger demand. Further, these improvements would allow the airport terminal design to be adaptable to future changes and unexpected growth.

2.7 PROPOSED ACTION

The intent of the PUW Runway Realignment Project is to bring PUW into compliance with FAA design standards and to improve terminal and airside facilities to accommodate existing demand and future growth. The following list includes specific details of the elements included in the Proposed Action to accommodate existing user needs:

- Realign Runway 6/24 to meet design standards for C-III aircraft
- Extend the realigned Runway 6/24 from 6,700 feet to 7,100 feet
- Widen Runway 6/24 from 100 to 150 feet
- Provide taxiway infrastructure to serve the realigned runway and aircraft parking areas
- Develop revised approach and departure procedures for the realigned runway to provide approach capabilities for a Category I with ½ mile and 200-feet visibility (supported with Remote Visual Range (RVR),centerline and touchdown zone lighting)
- Provide runway and taxiway lighting for new pavement surfaces
- Relocate or replace existing ground based navigational aids
- Relocate or replace existing weather reporting equipment
- Expand or relocate the existing passenger terminal
- Acquire land through avigation easement, fee simple, or both as needed to support development of the preferred alternative identified in the Environmental Assessment (EA)

Design challenges associated with the realignment of the Airport's runway were identified in the Phase II Airport Master Plan. The most critical design challenge is the relocation of the Avista Energy Corridor, which interferes with grading and air space associated with the Proposed Action. While this component is not the purpose of the Proposed Action, it would be implemented in order to achieve the Proposed Action.

2.8 PROPOSED FEDERAL ACTION AND ANTICIPATED TIME FRAME

As previously stated, FAA is the Federal Lead Agency for the proposed project and the Cities of Pullman, Washington and Moscow, Idaho are the project sponsors. The proposed Federal action is unconditional approval of the proposed project on the ALP and subsequent federal funding to implement the project. As a Federal agency, FAA can neither approve nor fund proposed projects without performing an evaluation of the project's potential impacts on the natural and human environment.

The purpose of this EA is to allow FAA to determine whether a significant impact would result from the proposed project. If no significant impact is identified, a final EA will be prepared and FAA will issue an environmental finding. This would either be a Finding of No Significant Impact (FONSI), or, if additional data are required, or if potentially significant impacts are identified during the performance of this EA, FAA will undertake an Environmental Impact Statement (EIS).

FAA and the project sponsors anticipate the following timeline for the proposed project[2]:

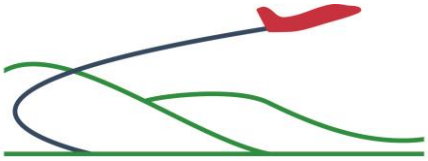
- October 2014 – FAA issues an Environmental Finding, should a FONSI be issued, the following schedule is planned:
    - November 2014 – November 2015 – Engineering Design/Land Acquisition
    - November 2015 – November 2016 – Construction Phase I
    - November 2016 – November 2017 – Construction Phase II
    - November 2017 – November 2018 – Construction Phase III

If the FAA deems that environmental impacts are great enough to warrant that an Environmental Impact Statement will be required. A timeline for this path will be drafted at the time of decision.

[2] It is important to note that funding for improvements to the passenger terminal have not yet been identified; therefore, terminal improvements are not included in the project timeline.

Chapter 3 Alternatives

FINAL ENVIRONMENTAL ASSESSMENT



Chapter 3 Alternatives

This Alternatives Chapter provides information about alternatives development and the evaluation process used to identify a Preferred Alternative for the Proposed Action at Pullman-Moscow Regional Airport (PUW). The identification, consideration, and analysis of alternatives are essential to the National Environmental Policy Act (NEPA) process and the goal of objective decision making. This chapter examines the No Action Alternative required by NEPA, as well as a range of alternatives for each component of the Proposed Action to meet the Purpose and Need.

Federal environmental regulations concerning the environmental review process require that all reasonable alternatives that may accomplish the objectives of a proposed project be identified and evaluated. Such a requirement serves to establish that all reasonable alternatives have been considered and that an alternative capable of addressing the project Purpose and Need with fewer adverse environmental impacts has not been prematurely dismissed from consideration.

The Council on Environmental Quality (CEQ) regulations state that analyzing alternatives "is the heart of the environmental impact statement" (CEQ 1502.12). In accordance with the CEQ regulations and other applicable guidance regarding compliance with NEPA, a range of reasonable alternatives has been identified that may accomplish the objectives of the Proposed Action. As stated in Chapter 2, Purpose and Need, the purpose of this project is to meet Federal Aviation Administration (FAA) design standards for the runway and to accommodate existing and forecasted operations by improving airside and terminal facilities.

3.1 RANGE OF ALTERNATIVES CONSIDERED

The evaluation of reasonable alternatives is required by NEPA and by CEQ Regulations (40 CFR §1502.14) because some aspects of the Proposed Actions may impact the environment in a manner that could be minimized or eliminated by pursuing an alternative action. The CEQ has defined "reasonable" as those alternatives that are prudent and feasible from a technical and economic standpoint.[1] An alternative is not reasonable if it would not meet the project's Purpose and Need.

The CEQ regulations require the following with respect to the analysis of alternatives in an EA:

- Analysis shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment (CEQ 1502.1).
- The range of alternatives discussed in environmental impact statements shall encompass those to be considered by the ultimate agency decision maker (CEQ 1502.2(e)).
- Agencies shall include reasonable alternatives not within the jurisdiction of the lead agency (CEQ 1502.14(c)).
- Agencies shall include the alternative of No Action (CEQ 1502.14(d)).

[1] "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," http://energy.gov/sites/prod/files/G-CEQ-40Questions.pdf

As described earlier in Chapter 2, Purpose and Need, the proposed improvements included in this Proposed Action are intended to address a specific Purpose and Need. This section describes the method by which alternatives were initially identified to meet that Purpose and Need. To allow for the consideration of the possible range of alternatives, four broad types of alternatives were identified:

- **No Action Alternative:** The alternative of not pursuing the proposed improvements is called the No Action Alternative and is required by the CEQ regulations implementing NEPA. This alternative is the baseline to which the "action" alternatives are compared.
- **Use of Smaller Aircraft, Other modes of travel or telecommunications:** This alternative considers using smaller aircraft which would not require runway improvements to meet C-III design standards.[2] It also considers that other modes of travel and telecommunications might serve the air travel needs of passengers, thereby reducing the need for physical airside and landside improvements to the Airport.
- **Use of other airports:** This alternative considers reducing the need for improvements at PUW by shifting operations or passengers to other local area airports such as Lewiston-Nez Perce County Airport or Spokane International Airport.
- **Development Improvements at PUW:** This alternative considers different physical airside and landside improvements at PUW to achieve the project Purpose and Need.

3.2 INITIAL CONSIDERATION OF RANGE OF ALTERNATIVES

The FAA conducted an initial review of the broad types of alternatives for feasibility and their ability to meet the project's Purpose and Need. The following sections document that evaluation and the resulting identification of alternatives to be carried forward for further evaluation.

Those alternatives that were determined not to be feasible or to not meet the Purpose and Need were eliminated from further evaluation.

3.2.1 No Action Alternative

NEPA, as well as CEQ regulations, require consideration of a No Action Alternative. In some cases, the No Action Alternative meets the Purpose and Need. In all cases, the No Action Alternative serves as a reference point of existing conditions. When compared with another alternative, the No Action Alternative enables the identification of the probable impact of that alternative. The No Action Alternative for this EA consists of the existing PUW facilities. The airfield facilities at PUW do not currently meet FAA design standards, and the efficiency and operational functionality of the landside facilities do not meet existing or forecasted demand. Therefore, the No Action Alternative would not meet the project Purpose and Need. However, because the CEQ regulations require consideration of the No Action Alternative as a baseline, it is carried forward for evaluation.

[2] See **Section 2.2**, *Airfield Design Standards* for a description of C-III design standards.

3.2.2 Use of Smaller Aircraft, Other Modes of Transportation or Telecommunications

Use of smaller aircraft, use of other modes of transportation and use of telecommunications were evaluated in terms of their capability to divert passengers and cargo from the Airport by offering alternative modes of meeting travel needs. The ability of such alternatives to satisfy the need at PUW is largely dependent upon factors such as:

1) The airline's ability to use smaller aircraft at PUW;
2) The availability of other modes of transportation; and
3) Trip characteristics and travel needs of the air passengers.

3.2.2.1 Use of Smaller Aircraft

The design aircraft at PUW is the Bombardier Q-400. If this aircraft were replaced by smaller, slower aircraft, the required runway length would decrease. Although there has been a downturn in the economy, the use of these larger aircraft is expected to continue.

While a reduction in the critical aircraft size would not require an increase in airport design standards and decrease the runway length requirements, the FAA and Washington Department of Transportation (WSDOT) generally cannot limit or restrict the type of aircraft serving an airport where the airport meets certain design criteria and the operators of the aircraft desire to operate the aircraft at that airport. In general, commercial aircraft fleets are moving towards the use of larger aircraft. According to the Aerospace Forecast (FAA, March 2010), regional carriers are projected to continue transitioning to larger airplanes to increase per seat mile costs and increase profits. The forecast makes note of significant growth in the 70 to 90 seat airplane group, and the corresponding retirement of 50-seat regional jets. In 2004, one of the main users of PUW, Horizon Air (now part of Alaska Airlines), announced that they would start using larger aircraft in their fleet mix. The existing fleet mix of Alaska Air comprises the Q400 Bombardier, Canadair Regional Jets (CRJs), and the Boeing 737-800. The Q400 Bombardier, a C-III aircraft, is the smallest aircraft in the Alaska Airlines fleet. Based on industry trends and shifts in fleet at Alaska Airlines, it is unlikely that the size of aircraft will be reduced. Consequently, it is unlikely that aircraft that require less than C-III standards will be servicing PUW in the future.

Additionally, charter operators at PUW predominantly use larger aircraft. Part 121 charter operators require the longest runway lengths of all key user groups at PUW. Aircraft used most frequently by these operators are the Airbus A319 and the Boeing 737-800 (C-III aircraft). Operations by these aircraft are associated with charter flights conducted by commercial air carriers for Washington State University (WSU) and the University of Idaho (UI) athletic teams and their opponents. Many of these operations are currently utilizing other airports due to inadequate runway length at PUW as these operations typically require high useful load percentages.

Because commercial and charter aircraft fleets at PUW comprise larger aircraft, and there is no indication that the airlines intend to reduce the size of these aircraft, the use of smaller aircraft at PUW as an alternative to PUW is not reasonable.

3.2.2.2 Other Modes of Transportation

Alternative modes of transportation may provide other options to meet the travel needs of the region and, theoretically, to reduce the need to address the non-standard conditions at PUW. This alternative would require passengers to travel by highway (auto or bus).

Over-land travel must be compared to the flight options at the Airport. Auto travel from Pullman to Seattle (the most frequent destination in air service from PUW) is approximately 300 miles and takes about five hours in good weather. Comparatively, a traveler could fly from Pullman to Seattle in just over an hour. Similarly, auto travel from Pullman to Portland (approximately 355 miles) would take almost six hours and a car trip from Pullman to Spokane (approximately 83 miles) would take about one and a half hours. Flights to Portland or Spokane would, respectively, take less time. Moreover, auto travel times could increase due to factors such as winter driving conditions and high traffic volumes on the interstates.

While most flights from PUW are to those three markets, many of the passengers then connect to other flights and travel on to their final destination. The initial destination from Pullman is often determined by which connecting airport has corresponding service to the passenger's ultimate destination. The convenience of taking a flight rather than driving to a distant, final destination is obvious; however, the time saved by flying to these three more local markets for a connection is also important when evaluating alternative modes of transportation. Time is saved by flying, rather than driving, to the connecting airport.

The Pullman area is served by bus (Amtrak) with direct bus service to Spokane, and indirect service to Seattle and Portland. Travel by bus to Spokane can be accomplished two times per day with a travel time of one hour and twenty minutes. Indirect travel to Seattle includes a transfer in Spokane and is available twice per day with a travel duration of just over eight hours. Each day, two options are offered for travel to Portland; one option requires one transfer, while the other requires two transfers. The option with one transfer (in Spokane) only drives through the night (about nine hours of traveling) and has a 12 hour transfer in Spokane. The other bus option to Portland requires a stop in Spokane and Seattle, and has an overall travel time of fourteen hours. Other transit options include Pullman Transit and Wheatland Express.

While air travel could be accomplished in considerably less time than road travel to these cities, other modes of transportation are feasible. However, because auto or bus travel could consume the entire business day, alternative modes of transportation become less desirable. Costs of fuel and the value of time are an economic incentive for people or goods traveling long distances do so in a quick and efficient manner. For those reasons, use of bus or automobile modes as an alternative to PUW is not reasonable for most air travelers. Thus, it can be concluded that bus and automobile modes are not a feasible alternative to accommodating forecast air traffic demand using the type and size of aircraft already serving the Airport.

3.2.2.3 Telecommunications

Rapidly emerging technology, video-conferencing, and collaborative computing (real-time interactions over computers) could potentially satisfy at least some of the demand for air travel for business purposes. Considerable progress in the reliability and speed of voice and data communication has been made in the last decade. While high-speed communication services can be provided over existing telephone lines and through the internet, the widespread installation of fiber optics and state-of-the-art electronic signal technology is expected to result in notable technological improvements in the next decades.

Telecommunication improvements will facilitate doing business in today's global economy. For example, the need to travel to attend meetings may be reduced for some businesses that can take advantage of digital video technology. However, while improved communications and video-conferencing technology may relieve some of the potential future demand for business air travel, it is conceivable that improved communications may actually increase the demand for business air travel.[3]

While telecommunications may have an impact on business travel, it likely does not affect leisure or required travel (i.e., athletic charter). Despite having been available for many years, telecommunication technologies have had little or no impact on demand for air travel at PUW. As shown in **Table 3-1**, passenger volume at PUW remained consistent from 1990 to 1999, and then enplanements declined between 1999 and 2004. Since 2004, PUW has experienced a period of sustained recovery. This increase in passenger boardings since 2007 runs counter to the national trend. Nationally, enplanement numbers have declined since the US economy entered a recession in 2008. Despite the emergence of wide-scale telecommunications technology, enplanements have increased at PUW, and forecasts predict further increases in passenger demand at the Airport.

Table 3-1: Enplanements at PUW

Year	Boardings
1990	35,320
1991	30,680
1992	32,960
1993	31,987
1994	36,851
1995	36,622
1996	37,687
1997	34,283
1998	28,524
1999	34,858
2000	33,221
2001	28,291
2002	27,794
2003	24,596
2004	20,980
2005	22,874
2006	23,838
2007	24,856
2008	32,108
2009	32,443
2010	35,248
2011	39,134
2012	38,547

Source: Air Carrier Activity Information System

All things considered, the use of smaller aircraft, other modes of transportation or telecommunications is not likely to reduce demand for air travel at PUW. Additionally, these options would not correct the nonstandard conditions at the Airport and would not increase reliability and efficiency at the Airport. Therefore, this alternative does not meet the Purpose and Need and was not carried forward for evaluation.

3 *Do Telecommunications Affect Passenger Travel or Vice Versa?: Structural Equation Models of Aggregate U.S. Time Series Data Using Composite Indexes*, Sangho Choo, Patricia L. Mokhtarian, Transportation Research Record Volume 1926 / January 2005.

3.2.3 Use of Other Airports

PUW is located between two airports with air service. Spokane International Airport is 75 miles to the north and Lewiston-Nez Perce County Airport is 35 miles to the south. While Spokane has a greater choice of airlines, flight frequency, and destinations, it is less convenient for passengers who travel to or connect in Seattle, or for those using the Alaska Air network, due to driving distance to access Spokane. The travel time required to drive to Spokane coupled with higher parking rates, cost of fuel to drive to Spokane, and loss of productivity for business travelers makes PUW a more convenient and affordable choice. In some cases, Spokane does not provide comparable connecting flights as Seattle, and would require passengers to make 2-stops before reaching their final destination.

Because of its close proximity, Lewiston's aviation profile is closely intertwined with PUW, although they both have their unique airline service niches. However, considering the combined service areas of both airports, PUW is located at the center of the area's population and business travel interests, particularly due to the presence of two major universities. PUW's location is central to the Pullman-Moscow population and its employment centers, making it the most convenient airport for passengers in these communities. Further, this area is forecasted to attract new business and residents in the next 20 years (Phase II Master Plan).

During the winter months when weather-related cancellations and delays are higher at PUW, demand shifts to other airports. The use of other airports would not improve reliability at PUW. Moreover, this alternative would not meet the Purpose and Need of this project. It would not correct the nonstandard conditions at the Airport, would not provide for an increased reliability and efficiency, and would not accommodate for existing operations and forecasted growth. Because this alternative would not meet the Purpose and Need of the project, it was not carried forward for further evaluation.

3.2.4 Development Alternatives at PUW

Development alternatives for the Proposed Action were designed to meet the Purpose and Need, as discussed in Chapter 2. To address FAA design standards, reliability, and the ability to accommodate existing operations and forecasted demand at PUW, a number of reasonable runway improvement options were considered for accomplishing the objectives of the project.

Alternatives to address airside facility issues via runway improvements have been identified by previous planning studies at PUW. Specifically, the Pullman-Moscow Regional Airport Master Plan evaluated numerous alternatives to improve the runway. The Phase I Airport Master Plan (2007) evaluated a total of eight runway alternatives, including five on-site alignment alternatives and three off-site alignment alternatives, to determine the optimized runway design for C-III aircraft with lower approach procedure minimums and, therefore, improved reliability during inclement weather. Existing approach minimums at the Airport require approximately a 500 foot ceiling (above ground level) and 1.5 miles of visibility for aircraft to land. With lower approach minimums, it is more likely that aircraft can successfully land in inclement weather conditions.

The Phase II Airport Master Plan (2013) refined the Phase I alternatives and conducted both a runway length analysis and runway width analysis to determine the required length and width of the runway at the Airport. Additionally, long-range planning considerations for future runway extension options were identified for some alternatives to determine the feasibility of future improvements at the Airport.

Using the analysis in these planning documents, this section describes several conceptual alignments for improving the runway at PUW to meet FAA design standards. Based on the design aircraft for PUW, the C-III Bombardier Q-400, FAA standards require a runway width of 150 feet and a runway-taxiway separation (runway centerline to taxiway centerline) of 400 feet (AC 150/5300-13). According to a runway length analysis (using the Citation X as the design aircraft for that criteria), the recommended runway length for PUW is at least 7,100 feet. The current runway at PUW does not meet these design standards.

The overall objective of the development alternatives evaluation is to first identify a full range of options for runway improvement (see **Section 3.2.4.1**, *Runway Improvement Options*), then to narrow these generalized options to select those that are reasonable and feasible for further refinement and comparative evaluation, (see **Section 3.2.4.2**, *Runway Improvement Alternatives*). The following generalized options of runway improvements were considered:

- Improvements to the existing runway;
- Relocation of the runway to the south ridgeline – changing the location of the runway to the ridgeline south of the existing runway;
- Shifting of the runway – translating the runway north or south of, and in close proximity to, the existing runway;
- Re-alignment of the runway – changing the direction of the runway centerline; and
- A combination of runway relocation, shifting, and/or re-alignment.

Each of these runway improvement options is discussed in the next section.

3.2.4.1 Runway Improvement Options

The existing runway at PUW does not meet FAA design standards for the critical aircraft (see **Section 2.2**, *Airfield Design Standards*). Generalized development options to improve airside facilities via runway improvements are discussed in the following sections. If an option was found to be reasonable, it was carried forward for further analysis, as described in **Section 3.2.4.2**, *Runway Improvement Alternatives*.

3.2.4.1.1 Improvements to the Existing Runway

The option of implementing improvements to the existing runway would increase the runway – taxiway separation, extend the length of the existing runway, and address incompatible land uses within the runway protection zone (RPZ) (see **Figure 3-1**, *Improvements to the Existing Runway*). To meet recommendations for runway length, this option would require an extension of the runway and taxiway towards the east, towards the west, or a combination of both. Extension of the runway west is constrained by WSU and the Palouse Ridge Golf Course. Extension of the runway east is constrained by rising topography, and would

require significant earthwork to meet runway and taxiway safety area grade requirements and create the required obstacle clearance surfaces for instrument approaches and departures.

Expanding the distance between the runway and taxiway would require the relocation of the taxiway north of its existing position. This action would require the demolition and reconstruction of adjacent airport facilities, the realignment of Airport Road, and relocation of off-airport residences. Other considerations for improvements would include incompatible land uses associated within the proposed RPZ. These uses include the SR 276 ROW, the Avista Energy Corridor, and Terra View Drive, as well as WSU access roads and facilities.

With regard to the feasibility of implementing the option, the construction effort would interrupt service at the Airport for an extended amount of time, forcing operators to relocate temporarily. The lost revenue would add to the net costs of implementation. Estimations show that over 16 million cubic yards of earthwork (cut and fill) would be required to implement this option, with a total cost of approximately $297 million. Because of the physical and financial constraints associated with this option, improvements to the existing runway could not be reasonably and prudently implemented. As such, improvements to the existing runway would not be a reasonable option.

3.2.4.1.2 Relocation of the Runway to South Ridgeline

Recognizing the substantial constraints at the existing location of the runway, this option attempts to reduce those by relocating the runway to the ridgeline that overlooks the existing airfield just south of the Airport (see **Figure 3-2**, *Relocation of the Runway to South Ridgeline*). In concept, this option would provide better terrain clearance for approaches and departures. Runway relocation to the ridgeline was considered as a way to reduce existing constraints while improving runway components to meet FAA's C-III design standards.

The relocation of the runway would improve the all-weather reliability of the Airport when compared to existing conditions by avoiding and/or minimizing terrain that penetrates air space for approach and departure procedures. This option would potentially provide approach capabilities for a Category I approach[4] with ½ mile visibility and 200-foot decision height, which, as discussed previously, would increase the likelihood of an aircraft's ability to land successfully in inclement weather. The relocated runway could be extended to meet FAA recommended runway length requirements without the constraint of WSU to the west. However, relocating the runway to the ridgeline south of the airport would require extensive refinements to resolve topographical changes. First, extensive earthwork would be required to flatten the ridgeline to adjust for the varying elevations. Second, a connection would need to be established between the existing landside facilities and the new runway. The only option for this connection would be to relocate landside facilities next to the new runway. Aircraft taxi from the existing facilities to the new runway would not be feasible due to the elevation change.

[4] When an approach is flown using an Instrument Landing System (ILS), the pilot follows the ILS guidance until the decision height (DH) is reached. For a Category I approach, the standard DH is 200 feet.

Extensive earthwork would be necessary to flatten the ridgeline. Large amounts of fill material would have to be moved off-site, requiring a large number of trucks to haul and transfer the material. Further, not all of the fill material could be accommodated on the existing site; therefore, a new site would have to be approved to accept the material. Incompatible land uses within the proposed RPZ would need to be addressed. These uses include the SR 276 ROW, the Avista Energy Corridor, and Terra View Drive, as well as WSU access roads and facilities.

This improvement option would require approximately 12 million cubic yards of earthwork and would cost approximately $300 million. Because of the financial constraints associated with this option, it was not found to be practicable and, therefore, was not further refined.

3.2.4.1.3 Shifting of the Runway

This option would entail shifting the runway parallel to the existing runway to provide adequate runway – taxiway separation and meet other C-III design standards. The existing runway would be converted to a taxiway and the new runway would be offset 400 feet from the proposed taxiway to meet C-III standards for runway-taxiway separation.

A shift of the runway north of the existing runway would exacerbate existing constraints and non-standard conditions. This shift would require the demolition and reconstruction of adjacent airport facilities and would not mitigate for existing constraints on the runway. Due to physical and financial constraints, a northward shift of the runway would not be a reasonable runway improvement option. Therefore, this option was not further evaluated.

A shift of the runway south 400 feet and conversion of the existing runway to a taxiway would mitigate for existing constraints, while allowing the airfield to meet C-III design standards including the recommended runway length, runway width, and the runway-taxiway separation (see **Figure 3-3**, *Shift of Runway South of Existing Runway* in **Section 3.2.4.2**, *Runway Improvement Alternatives*). Extension of runway length would still be constrained by WSU to the west and topography to the east, but the move south would ease these constraints. This option would provide for the distance required for runway-taxiway separation and would allow for future landside development. Further, this option would improve the all-weather reliability of the Airport when compared to existing conditions by reducing approach minimums and potentially providing for a Category I approach with ½ mile visibility and 200-foot decision height from the west.

A shift of the runway south 400 feet would require a moderate amount of earthwork due to terrain on both runway ends and Part 77 clearances on the south side of the runway. Additional earthwork would be necessary to connect the new runway to the existing airfield. Disruptions to airport operations during construction would be moderate and would require temporary runway closures, though they could be mitigated through construction phasing. Airport operations could remain during most of construction. Additionally, the incompatible land uses within the proposed RPZ noted earlier would need to be addressed.

The option of relocating the runway 400 feet south of and parallel to the existing runway would require approximately 8.6 million cubic yards of earthwork and would cost approximately $204 million. This option

would meet the Purpose and Need of the project, and therefore was further refined in **Section 3.2.4.2**, *Runway Improvement Alternatives*.

3.2.4.1.4 Re-alignment of the Runway

Re-alignment of the runway, or changing the direction of the runway centerline, was considered as a way to improve the airfield conditions at PUW. Both clockwise and counterclockwise rotations were evaluated.

Re-alignment of the runway in a clockwise rotation would exacerbate existing constraints. This alignment would require significant earthwork because it runs opposite the natural topography of the ridge south of the Airport. The west end of the runway would be constrained by WSU, and would be further constrained by the Airport's existing landside facilities. Incompatible land uses in the proposed RPZ would have to be addressed. This alternative has major drawbacks because of the physical and financial constraints associated with the significant earthwork required to implement this alternative. For these reasons, this option for re-alignment was not considered feasible and was not further refined.

A counterclockwise realignment of the runway would mitigate for existing constraints by expanding the distance between the west end of the runway and WSU. This would allow for extension of the runway to meet the needed runway length of 7,100 feet, and provide greater reliability for approach and departure procedures to the west. This option could provide for a Category I approach with ½ mile visibility and 200-foot decision height from the west. However, in order to improve the runway-taxiway separation distance to meet C-III standards, this option would require the relocation of the taxiway north. In combination with the counter-clockwise rotation of the east end of the runway, this option would result in the need to demolish and reconstruct adjacent airport facilities on the east side of the runway.

Both of these options would need to address incompatible land uses within the RPZ which, in this scenario, would include SR 276 ROW, the Avista Energy Corridor, WSU facilities and access roads, and Terra View Drive.

A counterclockwise rotation of the runway would reduce constraints with regard to runway extension and approach/departure procedures to the west. However, this option was also not considered reasonable due to physical and financial constraints associated with relocating the taxiway north and the associated need to relocate the landside facilities.

Re-alignment of the runway, either clockwise or counter-clockwise, would require the relocation of all landside facilities, Airport Road, and residencies and businesses along Airport Road. Each of these options would require in excess of 15 million cubic yards of earthwork, and would cost more than $342 million. While a counterclockwise rotation of the runway would reduce constraints with regard to runway extension and approach/departure procedures to the west, neither of these options were considered reasonable due to physical and financial constraints. Therefore, this option was not further refined.

3.2.4.1.5 Combination of runway relocation, shifting, and/or alignment.

The option entailing a counterclockwise re-alignment of the runway was not carried forward. However, because this option presented a means of reducing constraints on the west end of the runway, it was considered in combination with the only option that was carried forward for further refinement: the shift of the runway 400 feet south of the existing runway. This combination option would be different from the Shifting of the Runway South option because it would also include a re-alignment of the runway centerline.

The option of combining the southward shift of the runway and the counterclockwise re-alignment of the runway (combination option) would improve the all-weather reliability of the Airport by reducing approach minimums and potentially providing for a Category I approach with ½ mile visibility and 200-foot decision height from the west. This option would allow C-III design standards to be met, would reduce approach and departure procedure constraints to the east and west, and would allow for further landside development at the Airport.

Similar to the Shifting of the Runway South option, the combination option would need to address incompatible land uses within the proposed RPZ. These land uses include SR 276 ROW, the Avista Energy Corridor, WSU facilities and access roads, and Terra View Drive.

This option would require approximately 6.4 million cubic yards of earthwork and would cost approximately $119 million. Because this combined option would reduce constraints and allow for the runway to meet C-III standards, it was determined to be a reasonable option and was carried forward for further refinement.

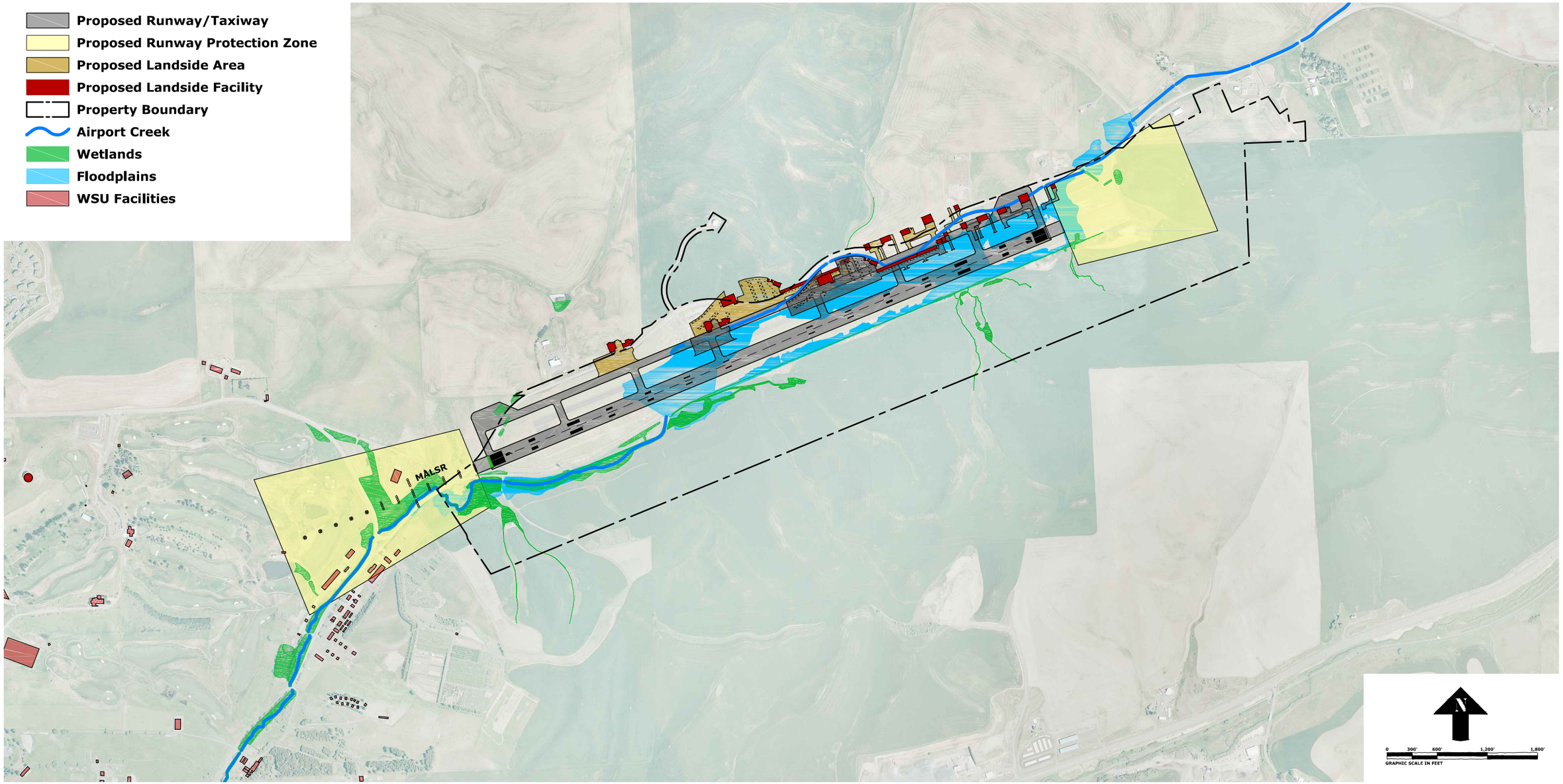


Figure 3-1 **Improvements to the Existing Runway**

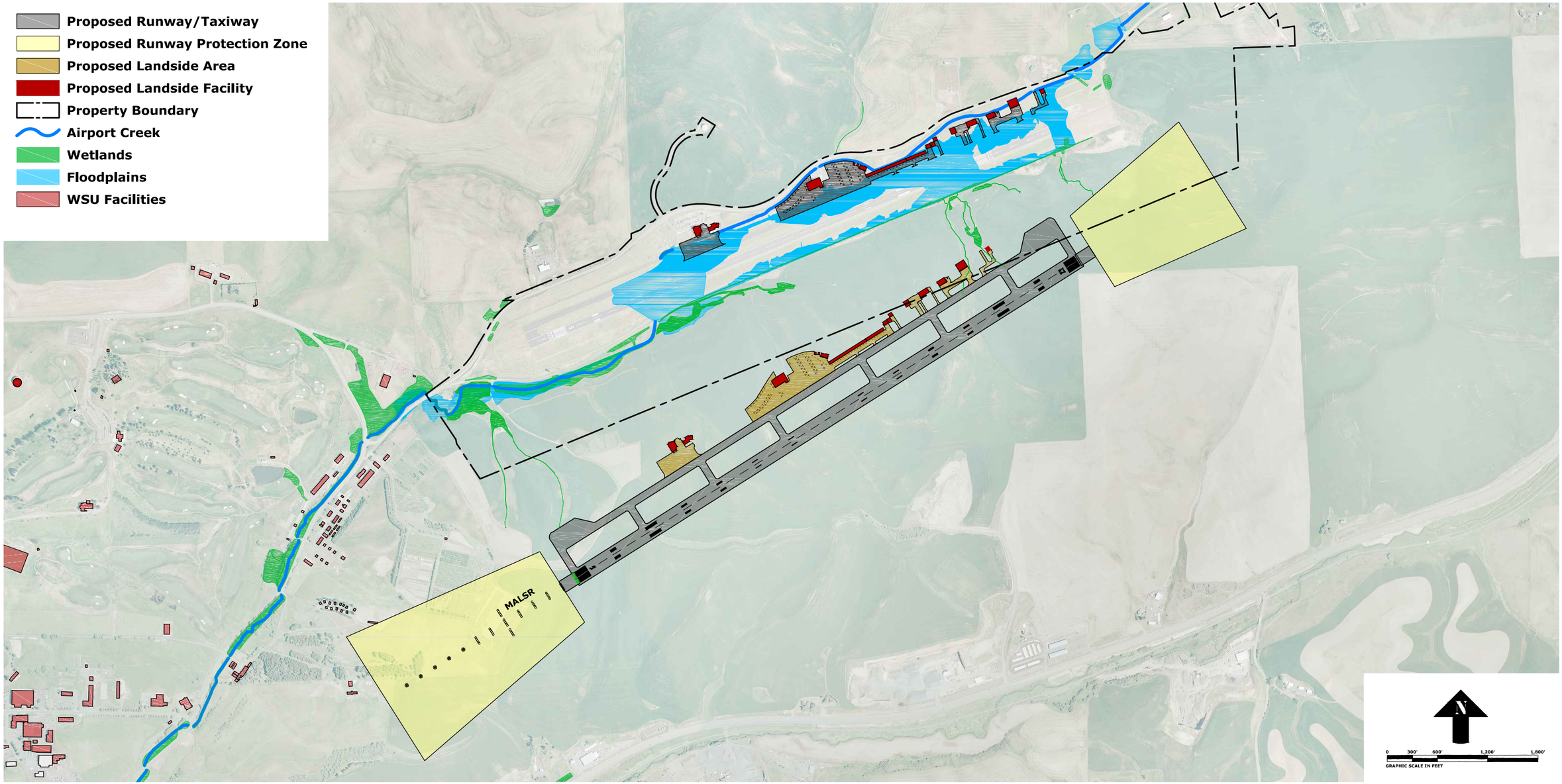


Figure 3-2 **Relocation of Runway to South Ridgeline**

3.2.4.2 Runway Improvement Alternatives

This section further refines the runway improvement options into development alternatives for the runway at PUW. This refinement provides for more detailed descriptions and evaluations of the options, and more specifically assesses cost considerations and the ability of each alternative to meet the project Purpose and Need. The discussion of existing environmental resources and potential impacts to these resources are included in **Chapter 4**, *Affected Environment* and **Chapter 5**, *Environmental Consequences*, respectively. However, the alternatives discussion summarized in this section highlights material differences among the alternatives regarding wetlands and waters of the US. Therefore, the requirements of Section 404(b)(1) of the Clean Water Act were considered in the comparison of alternatives. Impacts to wetlands and waters of the US are discussed in more detail in **Chapter 5**, *Environmental Consequences*.

This section also presents a detailed evaluation of the feasibility of constructing each development alternative. Constructability is considered to be an analysis of the primary components associated with the construction of an alternative. For the unique circumstances at PUW, the existence of topographical constraints in close proximity to the airfield affects the volume of earthwork associated with an alternative. This correlation is of high importance, as the magnitude of earthwork directly relates to the construction schedule, handling and disposal of materials, and cost of implementation.

The following development alternatives were examined to determine the alternative that best meets the Purpose and Need. Consistent with the project Purpose and Need, these alternatives are designed to maximize runway improvements. The No Action Alternative is included as required by the CEQ regulations.

3.2.4.2.1 No Action Alternative

The No Action Alternative would retain the existing runway and its current non-standard dimensions with no improvements. The runway length would remain at 6,700 feet, which is less than the recommended length.[5] The existing runway width and runway-taxiway separation distance would remain at non-standard dimensions for C-III aircraft. Because the runway would remain at B-II standards, this alternative would not reduce approach minimums, thereby not providing for all-weather reliability, nor would it provide the safest operating conditions for C-III aircraft. The absence of runway-related construction means there would be no adverse impacts. No enhancements in airfield safety would occur with the No Action Alternative.

3.2.4.2.2 Alternative 1: Shift of Runway South of Existing Runway

Alternative 1 would entail a new runway south of and parallel to the existing runway, and the conversion of the current runway to a taxiway (see **Figure 3-3**, *Shift of Runway South of Existing Runway*). The runway would be moved 400 feet south of the existing runway to meet C-III design standards for runway-taxiway separation distance, and the new runway and taxiway would be extended to meet the recommended runway length of 7,100 feet. Alternative 1 would be capable of providing an approach from the west with

[5] See runway length justification analysis in Appendix D.

standard Category I approach minimums with ½ mile visibility and 200-foot decision height, thereby improving reliability in inclement weather, and would achieve compliance with FAA C-III design standards.[6]

Construction of Alternative 1 would impact 11.4 acres of riverine wetlands and 9.7 acres of sloped wetland and ephemeral channel. Further, 10,700 feet of Airport Creek, which currently flows through a culvert underneath the existing airfield, would require re-routing to avoid impacts to the airfield. Construction of Alternative 1 would necessitate improvements off the east end of the runway in order to re-direct drainage from a Special Flood Hazard Area floodplain.

Incompatible land uses within the RPZ would include SR 276 ROW, the Avista Energy Corridor, Terra View Drive, and the Palouse Ridge Golf Course. Further, WSU facilities associated with Animal Science, Veterinary Medicine, and Horticulture would be incompatible with the proposed improvements in Alternative 1, Mitigation for these incompatible facilities would be necessary with the implementation of Alternative 1.

Substantial earthwork would be required as a result of terrain on both runway ends, FAR Part 77 clearances[7] on the south side of the runway, and additional earthwork necessary to connect the new runway to the existing airfield. When refining this option, alternatives for grading within Part 77 surfaces were considered. Based on the requirements specified in 14 CFR Part 77 for a 500 foot primary surface width with clearance of the 7:1 transitional surface, earthwork volumes would yield approximately 11.4 million cubic yards of cut material. In consideration of the earthwork that would be needed to accomplish this task and the large amount of excess material produced, a grading refinement of a 1,000 foot primary surface with maximum side slopes of 4:1 was considered. While this alternative would not fully comply with Part 77 requirements for a precision approach, it would require substantially less earthwork. In this case, cut material would be reduced to approximately 8.6 million cubic yards. Due to the vast difference in excess material produced, and to minimize earthwork and project costs, in October 2011 the FAA approved a 4:1 transitional surface at the Airport (see **Appendix E**).

Disruptions to airport operations during construction would be moderate and would require only temporary runway closures. Disruptions could be mitigated through construction phasing but would not be eliminated.

The shift of the runway south would not provide for any additional landside development area for new aviation facilities. As discussed in **Section 3.2.4.1.2**, *Shifting of the Runway*, this alternative would cost approximately $204 million.

[6] Note that in order to have Category I capabilities with ½ mile visibility and a 200 foot decision height, a MALSR (Multi-Task Learning via Structural Regularization) is required (not just an RVR (Runway Visual Range)).
[7] FAR Part 77 refers to regulation guidance for Safe, Efficient Use, and Preservation of the Navigable Airspace, as discussed in 14 CFR Part 77. Note: FAR Part 77 is not considered an FAA Design Standard.

3.2.4.2.3 Alternative 2: Shift of Runway with Counterclockwise Re-alignment

Alternative 2 is depicted in **Figure 3-4**, *Shift of Runway with Counterclockwise Realignment*. This alternative is a southward shift and counterclockwise rotation of the runway. A new taxiway would be constructed and both the runway and taxiway would meet the required length of 7,100 feet. Alternative 2 would be capable of providing an approach from the west with standard Category I approach minimums with ½ mile visibility and 200-foot decision height, thereby improving all-weather reliability. This alternative has a slight advantage in terms of aircraft departure and missed approach clearances when compared to Alternative 1.

In the refinement analysis for this option, an optimal distance of southward shift and degree of rotation were determined. To avoid impacts to landside facilities and to meet the required C-III design standard, it was determined that the runway would be shifted 400 feet south of the existing runway. The amount of air penetrations and earthwork were taken into consideration in determining the optimal degree of rotation. Ultimately, it was determined that a 5.5 degree counterclockwise rotation would result in fewer airspace and terrain penetrations and would improve approach capabilities. Additionally, this angle of rotation would take advantage of the existing topography, which would reduce the amount of earthwork needed to construct this option.

Construction of Alternative 2 would impact 11.4 acres of riverine wetlands and 9.7 acres of sloped wetland and ephemeral channel. Further, 10,700 feet of Airport Creek would be re-routed to avoid the runway and, like Alternative 1, improvements to the floodplain would need to be implemented to route drainage around the airfield. , Similar to Alterative 1, incompatible land uses within the RPZ would also need to be addressed. These incompatibilities include SR 276 ROW, the Avista Energy Corridor, Terra View Drive, the Palouse Ridge Golf Course, and WSU facilities associated with Animal Science, Veterinary Medicine, Horticulture, Animal Disease Research, and Western Region Plan Science.

Considerable earthwork would be required for terrain on both runway ends, Part 77 clearances, and the construction of the new runway and associated taxiways. With the agreed-upon 4:1 transitional surface, total earthwork cut volumes for Alternative 2 would amount to 6.4 million cubic yards.

Disruptions to airport operations during construction would be moderate and would require temporary runway closures. Though disruptions could be mitigated through construction phasing, they would not be eliminated.

This alternative would provide space for additional landside development of new aviation facilities. Alternative 2 is estimated to cost $119 million

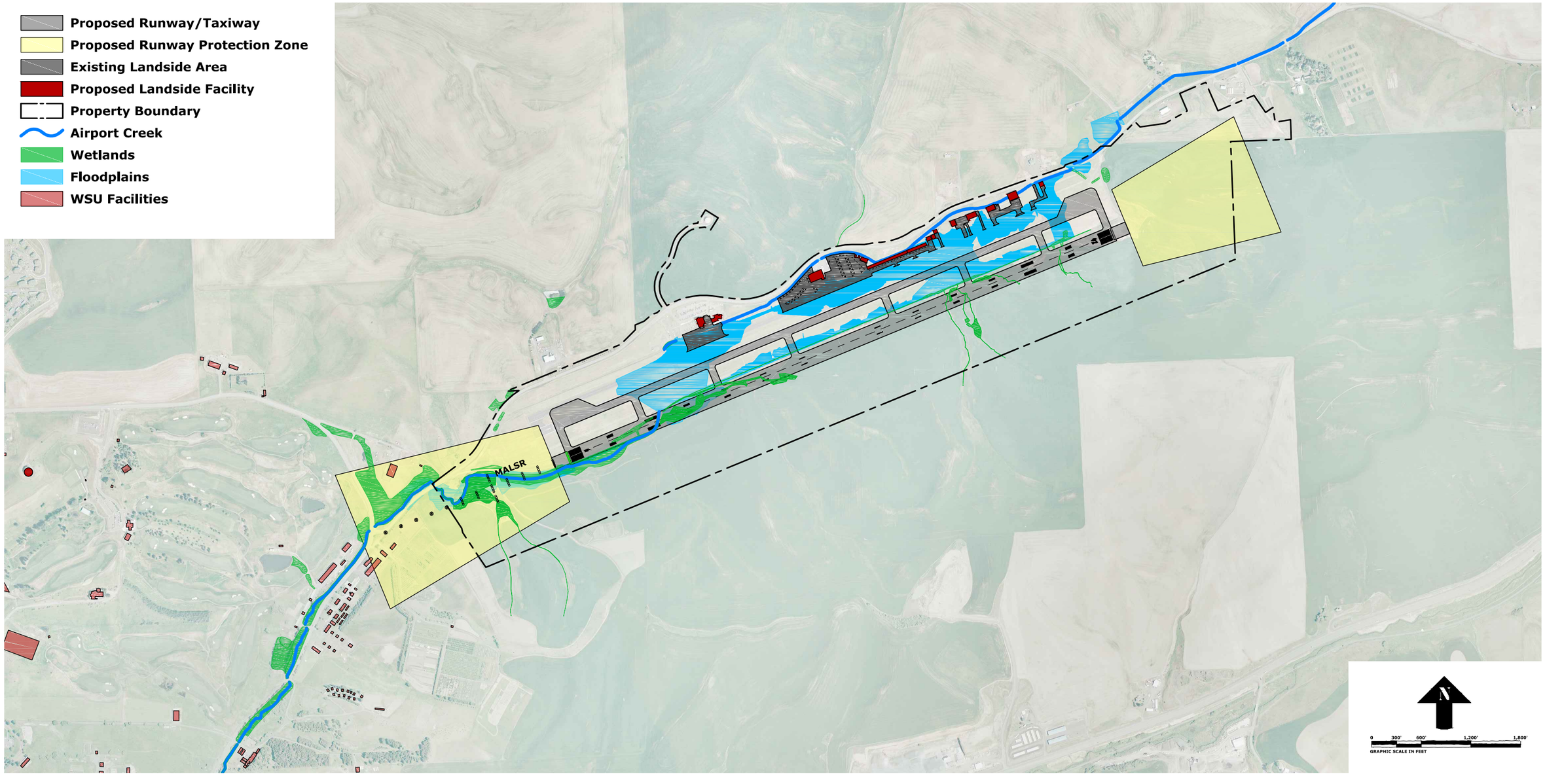


Figure 3-3 **Alternative 1: Shift of Runway South of Existing Runway**

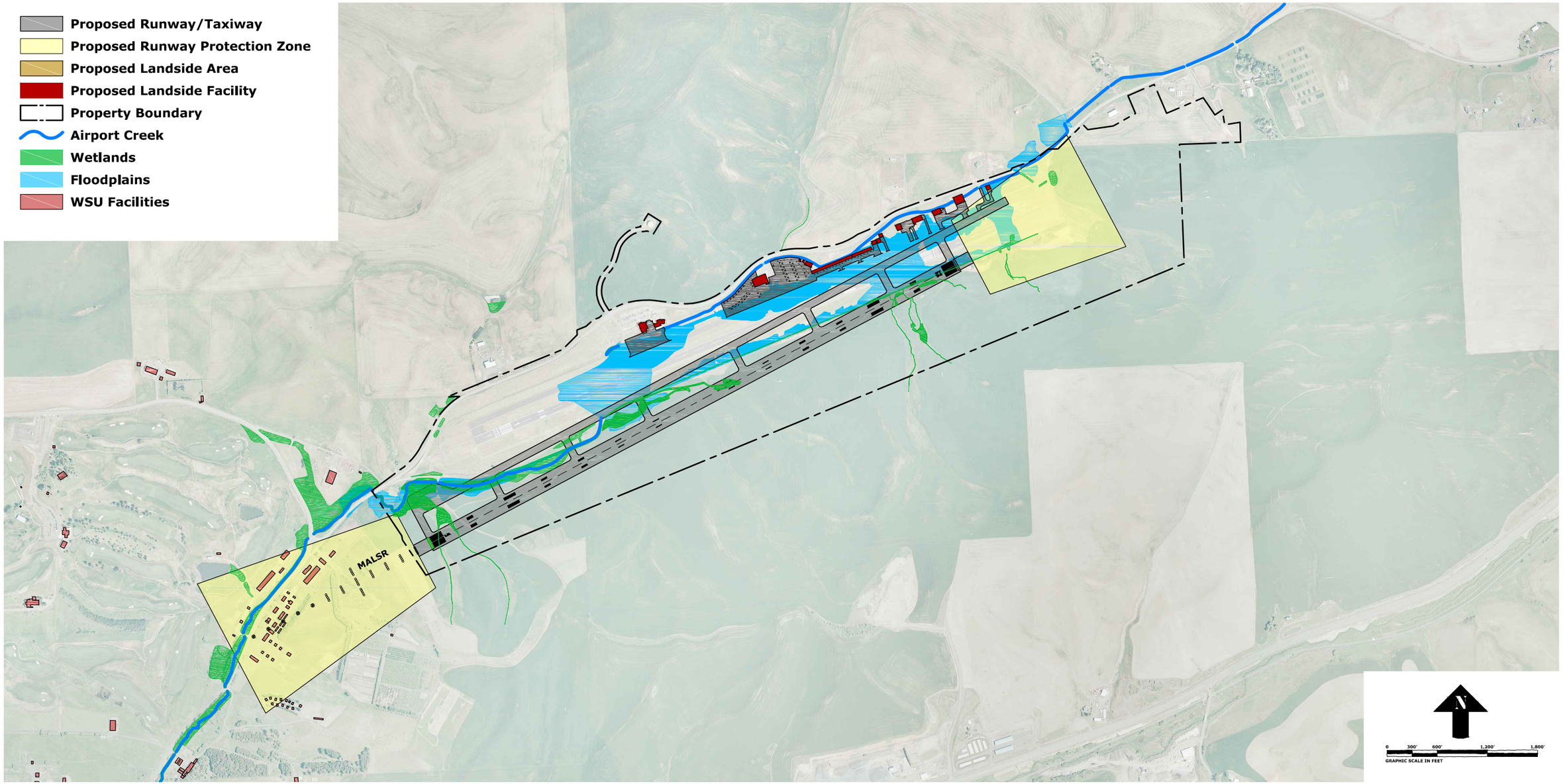


Figure 3-4 **Alternative 2: Shift of Runway with Counterclockwise Realignment**

3.2.4.3 Summary of Development Alternatives

Both of the development alternatives discussed above would achieve C-III design standards and would meet the Purpose and Need of the project. Both alternatives would be capable of providing an approach from the west with standard Category I approach minimums with ½ mile visibility and 200-foot decision height, thereby improving all-weather reliability. **Table 3-2** provides a summary evaluation of the development alternatives in comparison to the No Action Alternative.

As indicated in **Table 3-2**, Alternative 1 and Alternative 2 would both improve reliability at the Airport, while the No Action Alternative would result in no improvement. The development alternatives would result in similar impacts to wetlands and waters of the US. While Alternative 1 would impact fewer WSU facilities in the RPZ, this alternative would require approximately two times more earthwork cut for construction and would cost more than twice as much as Alternative 2. The primary reason for this difference is that Alternative 2 conforms more closely to the existing topography at PUW. As a result, it involves significantly less earthwork and has a lower cost than Alternative 1.

Both practicability and reasonableness need to be evaluated when considering the implementation of these alternatives. Because this project requires a wetland fill permit per Section 404 of the Clean Water Act evidence that "Least Environmentally Damaging Practicable Alternative" (LEDPA) is not inappropriately eliminated from further consideration. The term *practicable*, as defined by the Environmental Protection Agency's (EPA) Clean Water Act Section 404(b)(1), means available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes. The LEDPA, as defined in 40 CFR Part 230.10(a), is the alternative with the least impacts to the aquatic ecosystem, so long as the alternative does not have other significant environmental consequences. With regard to wetlands and waters of the US, the EPA's compliance guidelines state that no discharge of a dredged or fill material shall be permitted if there is a practicable alternative (Section 404(b(1) Subpart B, 230.10(a)). Because the development alternatives would result in the same amount of impacts to wetlands and waters of the US, and both alternatives could be feasibly implemented with current technology, the assessment of practicability is left to cost.

According to the CEQ, a *reasonable* alternative is defined as one that is economically and technically feasible, and that shows evidence of common sense. Both development alternatives meet the Purpose and Need and both are feasible. However, as a matter of sound engineering principles, the matter of cost comes into play.

Table 3-2: Comparison of Runway Improvement Alternatives Summary									
	Summary	**Riverine Wetland Impact (Acres)**	**Sloped Wetlands and Ephemeral Channels (Acres)**	**Airport Creek (Feet)**	**Construction Impact (Volume of cut material)**	**Meets FAA C-III Design Standards**	**Runway Length**	**Estimated Cost (millions)**	
								Alternative Cost	**Contingency Cost**
No Action	No Action	0	0	0		No	6,731 ft	$0	$0
Alt 1	Shift of Runway South of Existing Runway	11.4	9.7	10,700	8.6 million yds^3	Yes	7,100 ft	$153	$51
Alt 2	Shift of Runway with Counter-clockwise Re-alignment	11.4	9.7	10,700	6.4 million yds^3	Yes	7,100 ft	$89.25	$29.75

Since a determination has been made that both development alternatives are feasible, and the impacts between the two alternatives are equal, consideration of implementation potential was reduced to the factor of cost. Alternative 1 would cost more than twice as much as Alternative 2. Because of this difference in estimated cost of implementation, Alternative 1 was found not to be economically reasonable. Therefore, only Alternative 2 was carried forward for evaluation of runway improvements at the Airport.

3.3 TERMINAL IMPROVEMENTS

The existing passenger terminal building at PUW was originally built in 1989. Since that time, the surrounding communities, businesses and universities have continued to grow. In concert, passenger use and passenger demand at the Airport has grown. As a result, the existing passenger terminal does not have sufficient space to accommodate existing demand and will not be able to support future projected passenger demand.

Terminal improvements at PUW are intrinsically connected to the Proposed Action. Runway improvements would improve the Airport's all-weather reliability. This would reduce the number of scheduled commercial flight cancelations and increase the number of charter aircraft able to use the Airport. These changes would increase the demand on the passenger terminal, the aircraft parking apron, and vehicle parking. Terminal improvements would address capacity and functionality needs associated with airside improvements.

The 2013 Terminal Area Plan (TAP) determined the existing capacity of the terminal area and estimated future demand based on the forecasted numbers of passenger enplanements (see **Appendix C**). The terminal area includes the passenger terminal as well as landside and airside areas associated with the terminal. All of the spaces in the existing terminal building and the amount of area available in the existing terminal area were determined to be deficient to varying degrees. For this reason, a proportionally large amount of space needs to be added to both the terminal area and the terminal building in order to meet facility requirements.

The development alternatives for the passenger terminal area and terminal building were drafted to satisfy the Purpose and Need of the Proposed Action. It should be noted that all of the alternatives assume the proposed runway improvements will be constructed, as the terminal improvements would come after the runway (re)construction. Each terminal alternative was assessed for operational, economic, and sustainability factors, as well as implementation feasibility, and the ability to accommodate near-term and long-term development at PUW.[8]

3.3.1 No Action Alternative

The No Action Alternative would retain the existing terminal facilities with no improvements. The passenger terminal, as well as the associated landside (vehicle access and parking) and airside areas (aircraft access and parking) associated with the terminal, would remain unable to meet current or future demand. All of the spaces in the existing terminal building and the complex that were determined to be deficient would remain

[8] It is important to note that funding for improvements to the passenger terminal have not yet been identified; however, terminal improvements were analyzed for potential environmental impacts for future consideration.

in their existing conditions. The No Action Alternative would cause no adverse environmental impacts or socioeconomic impacts. At the same time, the No Action Alternative offers no enhancements in landside capacity or functionality.

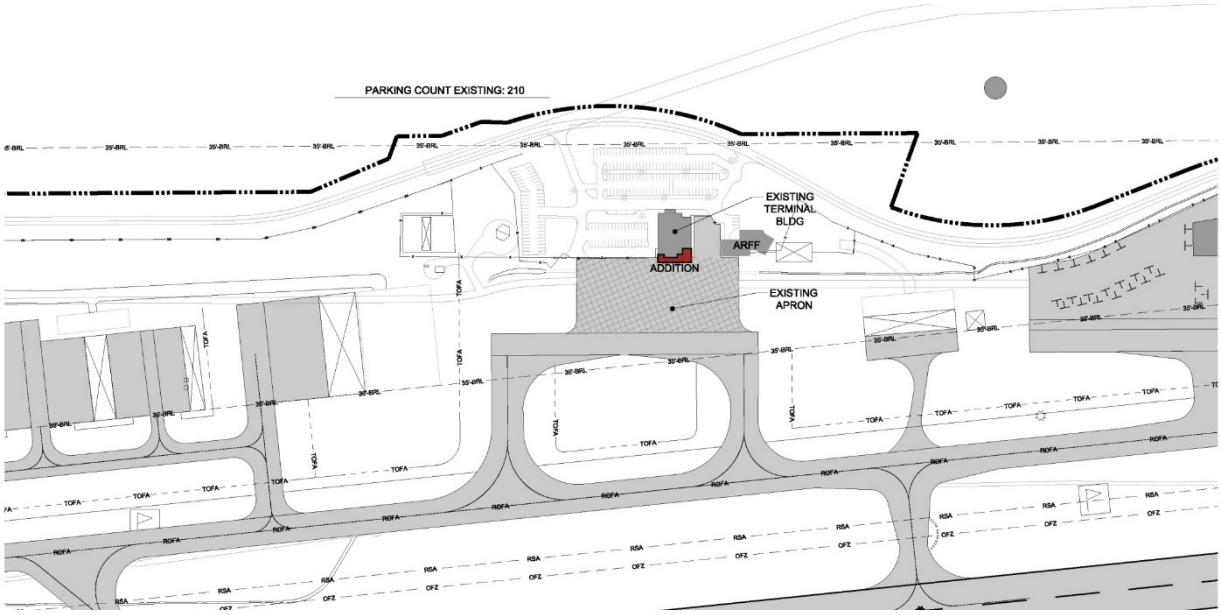
3.3.2 Terminal Alternative 1: Interim Addition and Renovation of the Existing Terminal

Terminal Alternative 1 consists of a small expansion of the existing terminal building including a small addition to the secure area of the existing terminal building, which would increase seating (from 46 to 68 seats). A small amount of space would be added to the security checkpoint area for more recomposure area and new restrooms would be constructed in the hold room area.

This alternative would provide a near-term expansion to address deficiencies in the hold room, but would not remedy any of the other building deficiencies or address long-term requirements. No environmental resources would be affected by this alternative. **Figure 3-5** shows the existing floor plan and proposed addition to the existing terminal. **Figure 3-6** shows the associated terminal area plan. The total estimated cost for Terminal Alternative 1 is $1,630,000.

Figure 3-5: Terminal Alternative 1, Existing Terminal and Addition / Renovation

Figure 3-6: Terminal Alternative 1, Terminal Area Plan



While this alternative addresses immediate needs of the terminal building hold room, it does not address other building deficiencies. For example, no improvements would be made to the non-secure area. Therefore, because this alternative does not take into account long-term needs of the terminal building or terminal area, it is not considered reasonable.

3.3.3 Terminal Alternative 2: Expansion and Renovation of the Existing Terminal

Terminal Alternative 2 comprises an expansion of and renovation to the existing terminal building and parking lot. The building expansion would provide new ticketing, security checkpoint, hold room, public lobby areas, and an expanded baggage claim area. Additionally, a second floor would be added to house administrative areas and support functions. The building expansion would align with the development of the runway improvements and would result in minimal changes to the access roadways.

Parking lot improvements would include an additional 508 parking spaces and a dedicated bus parking area. The unloading/loading area would be relocated to the west, along the new part of the terminal building. **Figure 3-7** shows the proposed expansion and renovation of the terminal building for Terminal Alternative 2. **Figure 3-8** shows the associated terminal area plan. The total estimated project cost is $36,345,000.

Figure 3-7: Terminal Alternative 2, Terminal Building First and Second Floor Plans.

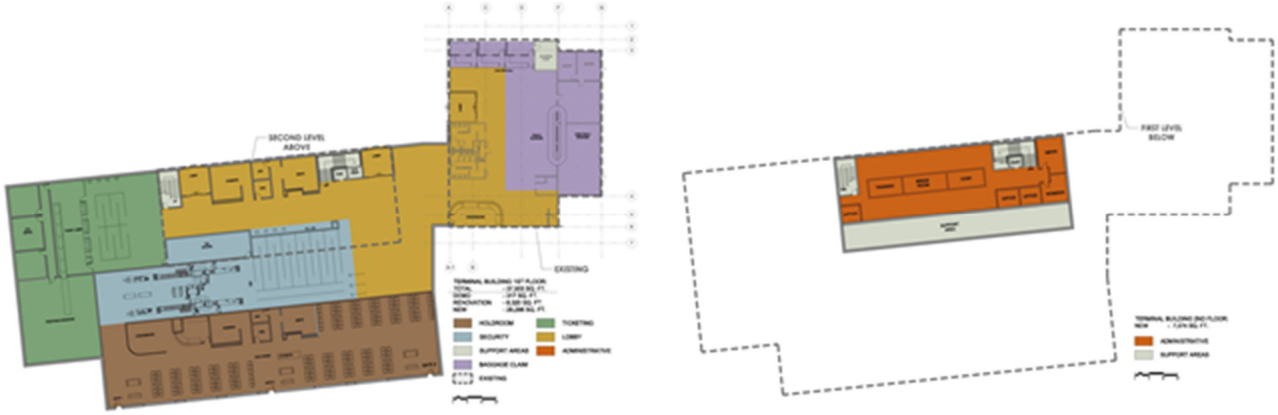
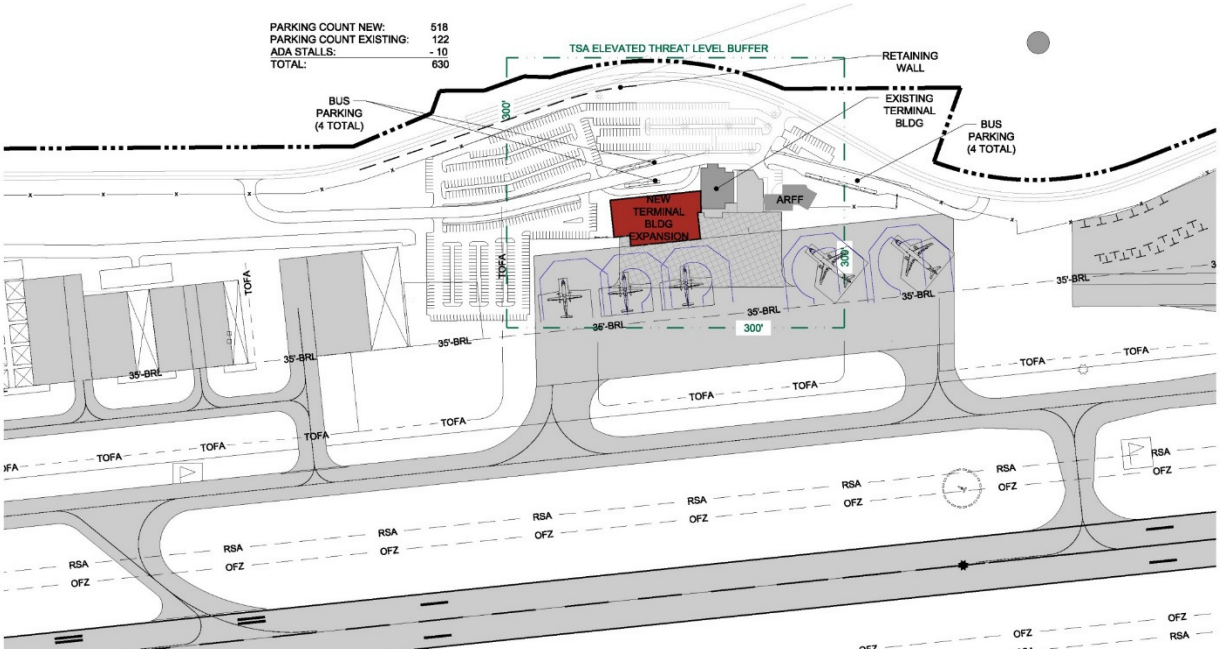


Figure 3-8: Terminal Alternative 2, Terminal Area Plan

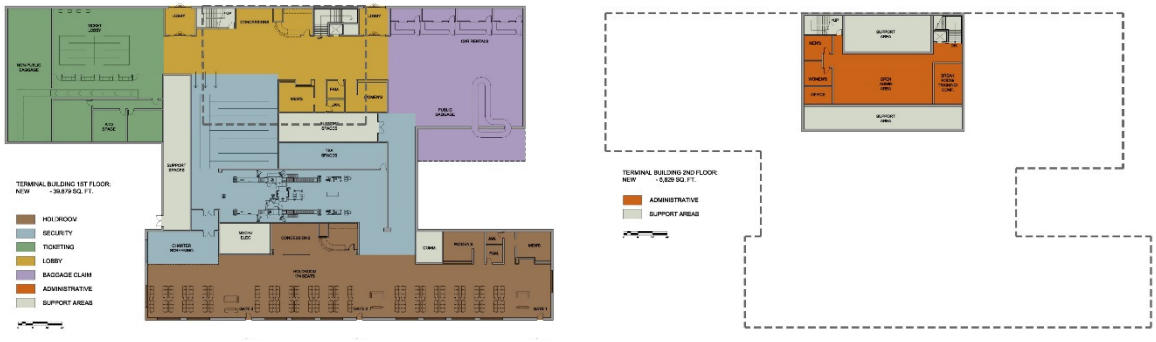


Terminal Alternative 2 would allow for additional expansion to the west. Because the new additions would be constructed on land that is already paved, no environmental impacts are anticipated. However, implementation of this alternative would require large amounts of earthwork. However, this alternative would provide insufficient parking area for future needs and a new oversized ramp area would be needed to accommodate the ARFF building. Because this alternative would not fully accommodate future demand, it is not considered reasonable and was not carried forward.

3.3.4 Terminal Alternative 3: Construction of New Terminal Near the Existing Terminal

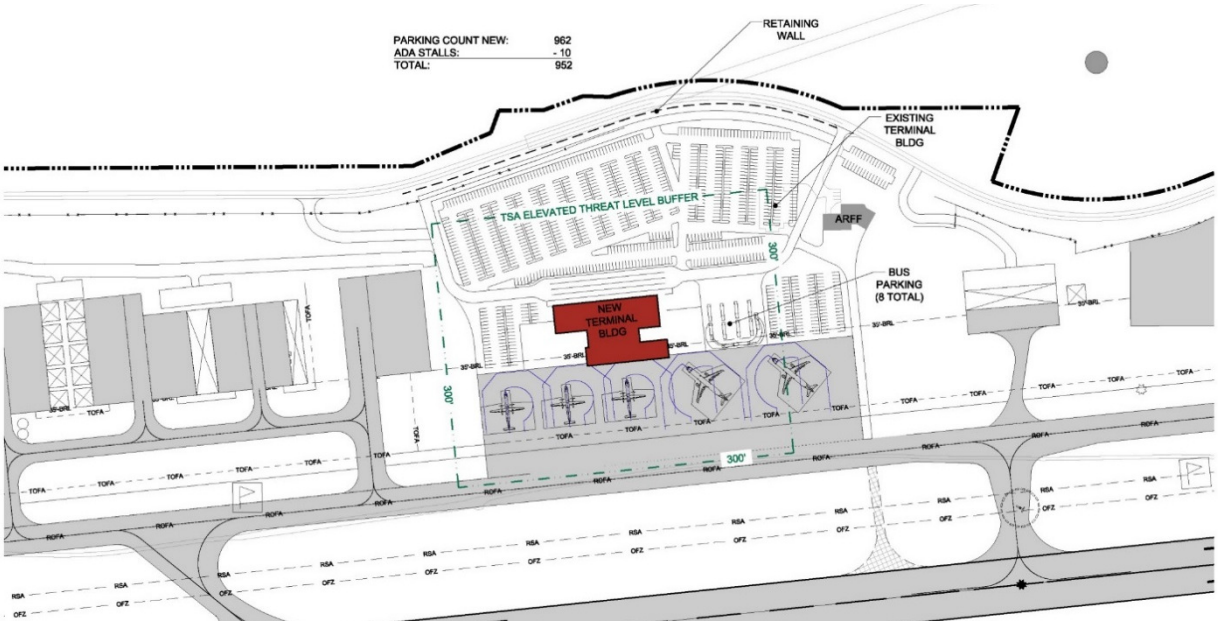
Terminal Alternative 3 proposes the construction of a new terminal building in close proximity to the existing terminal building, but the building would be closer to the proposed runway than either Alternative 1 or 2. Similar to Terminal Alternative 2, minimal changes would be made to the access roadways. The new building and apron would be located directly adjacent to the runway and the layout of the new terminal would be more efficient than the layout of Terminal Alternative 2. The existing parking lot would be expanded and would include a dedicated bus/charter staging area. **Figure 3-9** shows the proposed terminal building. **Figure 3-10** shows how Terminal Alternative 3 would fit into the Terminal Area Plan. The total estimated project cost is $39,590,000.

Figure 3-9: Terminal Alternative 3, Terminal Building First and Second Floor Plans[9]



[9] Note: Terminal Alterative 4 includes the same proposed changes to the terminal building, but a different layout in the Terminal Area Plan. Therefore, **Figure 4-5** represents the proposed building improvements for both Terminal Alternatives 3 and 4.

Figure 3-10: Terminal Alternative 3, Terminal Area Plan



Implementation of this alternative would require a substantial amount of earthwork due to the existing topography and new construction. The existing septic system would be relocated to accommodate additional parking and the extended sewer line, and a 15-foot retaining wall would be constructed along the parking area. Because additional pavement would be added, improvements to drainage would be necessary.

This alternative is a long-term solution that would meet current and future demand. Construction could occur while keeping the existing terminal operational. However, long-term building and site expansions would be limited by adjacent airport uses.

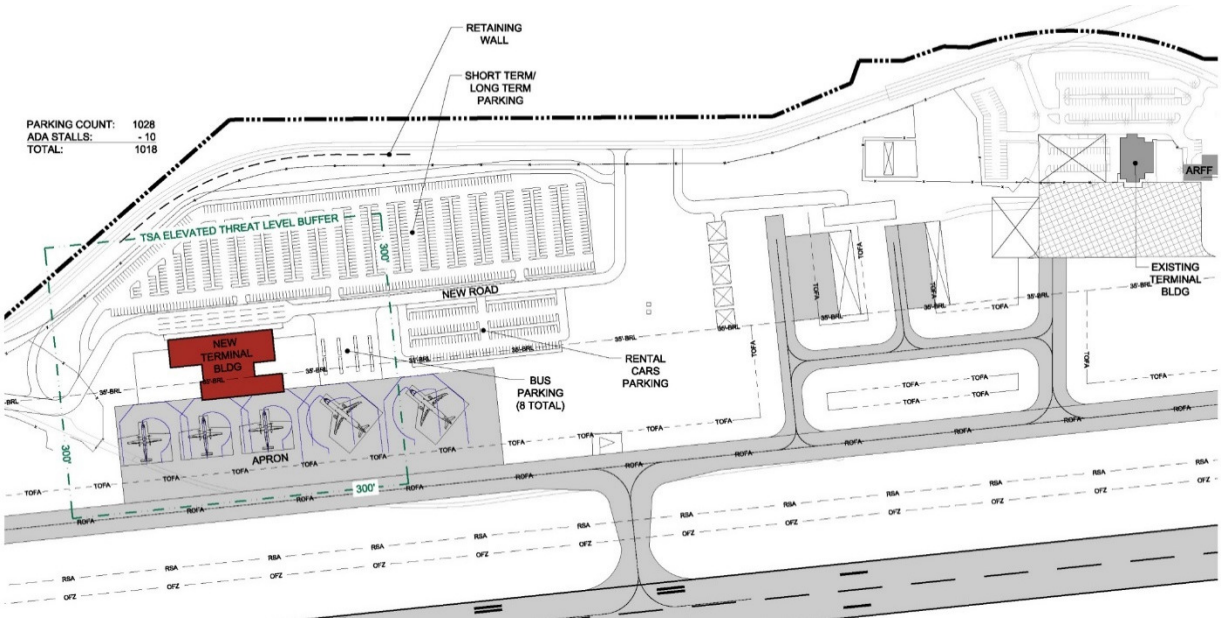
3.3.5 Terminal Alternative 4: New terminal at a New Location along the Realigned Runway

This alternative proposes a new terminal building that would be located in an area currently occupied by the existing airfield. The proposed terminal building facility would be the same as the one that is included in Terminal Alternative 3 (see **Figure 3-9**), but the layout of this terminal alternative in conjunction with other landside facilities would offer opportunities for new building utilities. Moreover, vehicle access and vehicle parking would be improved, with approximately 952 parking spaces and a dedicated bus/charter staging area. Terminal Alternative 4 would also provide a separation between the public terminal and other airport and general aviation activities. **Figure 3-11** shows the associated terminal area plan. The total estimated project cost is $40,340,000.

Implementation of this alternative would require a substantial amount of earthwork due to the existing topography and new construction. A retaining wall along the parking area would be approximately 12 feet

in height, and drainage issues associated with the addition of new pavement would need to be addressed. To aid in the construction of this terminal alternative, fill material from runway excavation (or from site to site cut and fill) could be used in construction of the terminal alternative. Constructing a new terminal would allow the Airport to manage future phasing and growth with general aviation development. Further, the Airport could benefit financially, as the existing ramp and terminal would be available for immediate revenue sources (estimated at $475,000 per year).

Figure 3-11: Terminal Alternative 4, Terminal Area Plan



Both Terminal Alternative 3 and Terminal Alternative 4 would meet the Purpose and Need of the Proposed Action. They would provide for long-term benefits by accommodating existing and future demand. Both alternatives would result in similar environmental impacts associated with drainage, and would cost approximately the same amount for implementation. A small advantage of Terminal Alternative 4 is that the Airport could benefit financially by leasing the existing ramp and terminal.

According to Section 706(d)(5) of FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, "if there are no unresolved conflicts concerning alternatives uses of available resources, the range of alternatives may be limited to the no action and the proposed action."[10] Because Terminal Alternatives 3 and 4 would result in the same potential effects (associated with

[10] FAA Order 1050.1E, *Policies and Procedures for Considering Environmental Impacts*, paragraph 405(d) cites "An EA must consider the proposed action and a discussion of the consequences of taking no action, and may limit the range of alternatives to action and no action when there are no unresolved conflicts concerning alternative uses of available resources."

drainage) for implementation, but Terminal Alternative 4 would provide a slight advantage over Terminal Alternative 3, it was decided based on 5050.4B that only the No Action Alternative and Terminal Alternative 4 would be carried forward for further analysis.

3.4 PREFERRED ALTERNATIVE FOR PROPOSED ACTION

By regulation, a federal agency is required to identify a Preferred Alternative as defined in CEQ's 40 CFR 1502.14. As defined in CEQ's "40 Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," an agency's preferred alternative is "the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors" (http://www.nepa.gov/nepa/regs/40/40p3.htm).

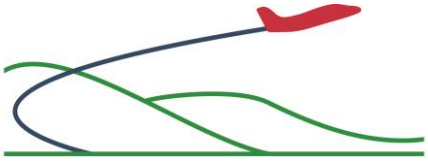
The Preferred Alternative for PUW's Proposed Action is unique in that it comprises components including improvements to the airside and landside facilities at the Airport. In this way, the overall Preferred Alternative provides a comprehensive means of achieving the Purpose and Need for the Proposed Action.

The Preferred Alternative for the PUW Proposed Action includes the following proposed improvements:

- Alternative 2: Shift of Runway with Counterclockwise Re-alignment
- Terminal Alternative 4: New terminal at a new location along the realigned runway

Chapter 4 Affected Environment

FINAL ENVIRONMENTAL ASSESSMENT



Chapter 4 Affected Environment

This chapter generally describes the character of the environment in which the Proposed Action would occur. The term "affected environment" is used to describe the areas and resources within and surrounding the project area that may potentially be affected by the proposed improvements to the Pullman-Moscow Regional Airport. Existing conditions for each resource category are described and are used as the basis for assessing the environmental consequences of the proposed project (see Chapter 5, *Environmental Consequences*).

4.1 PROJECT SETTING

Pullman-Moscow Regional Airport (PUW) is located within the city limits of Pullman, in Whitman County, Washington. The Airport is located four miles northeast of downtown Pullman and seven miles west of downtown Moscow, Idaho. The Washington State University (WSU) campus is immediately southwest of the Airport in Pullman. The Airport is 2,556 feet above mean sea level. The area surrounding the Airport is located outside of City of Pullman limits, and is mostly agricultural uses, with some residential and commercial uses on the north side of the Airport. The 468 acres of land owned by the Airport was purchased/deeded from the City of Pullman.

The Airport provides commercial airline passenger service and general aviation access to the residents and visitors of Pullman, Moscow, and other nearby communities in Whitman and Latah Counties. PUW is operated by an Airport Board that includes representatives from the Cities of Pullman and Moscow, Latah County, WSU, University of Idaho, and an at-large member.

A project study area was delineated to show all areas that could potentially be disturbed by the project (see **Figure 4-1**, *Study Area*). It is important to note, however, that different environmental resources may use different study areas for analysis. By necessity, the term "study area" can sometimes mean different areas for different resource categories. For example, historic resources are analyzed within a study area called the Area of Potential Effect (APE). The APE encompasses areas with the potential to incur direct or indirect effects that could impact the character or setting of a property or historic resource (see **Section 4.11**, *Historical, Architectural, Archaeological, and Cultural Resources* for more discussion on the APE and **Figure 4-6**, *APE and Historical Resources*). As such, a resource specific study area may be defined for a resource category.

4.2 AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of certain air pollutants. The National Ambient Air Quality Standards (NAAQS) consist of a primary and secondary standard for each pollutant that were established to protect the public health from harm within a margin of safety. All areas of the country are required to demonstrate attainment with the NAAQS. Areas that currently do not meet these standards are referred to as non-attainment areas. Other areas, where prior exceedance occurred, but that now achieve the standards are referred to as maintenance areas. Such areas are subject to State

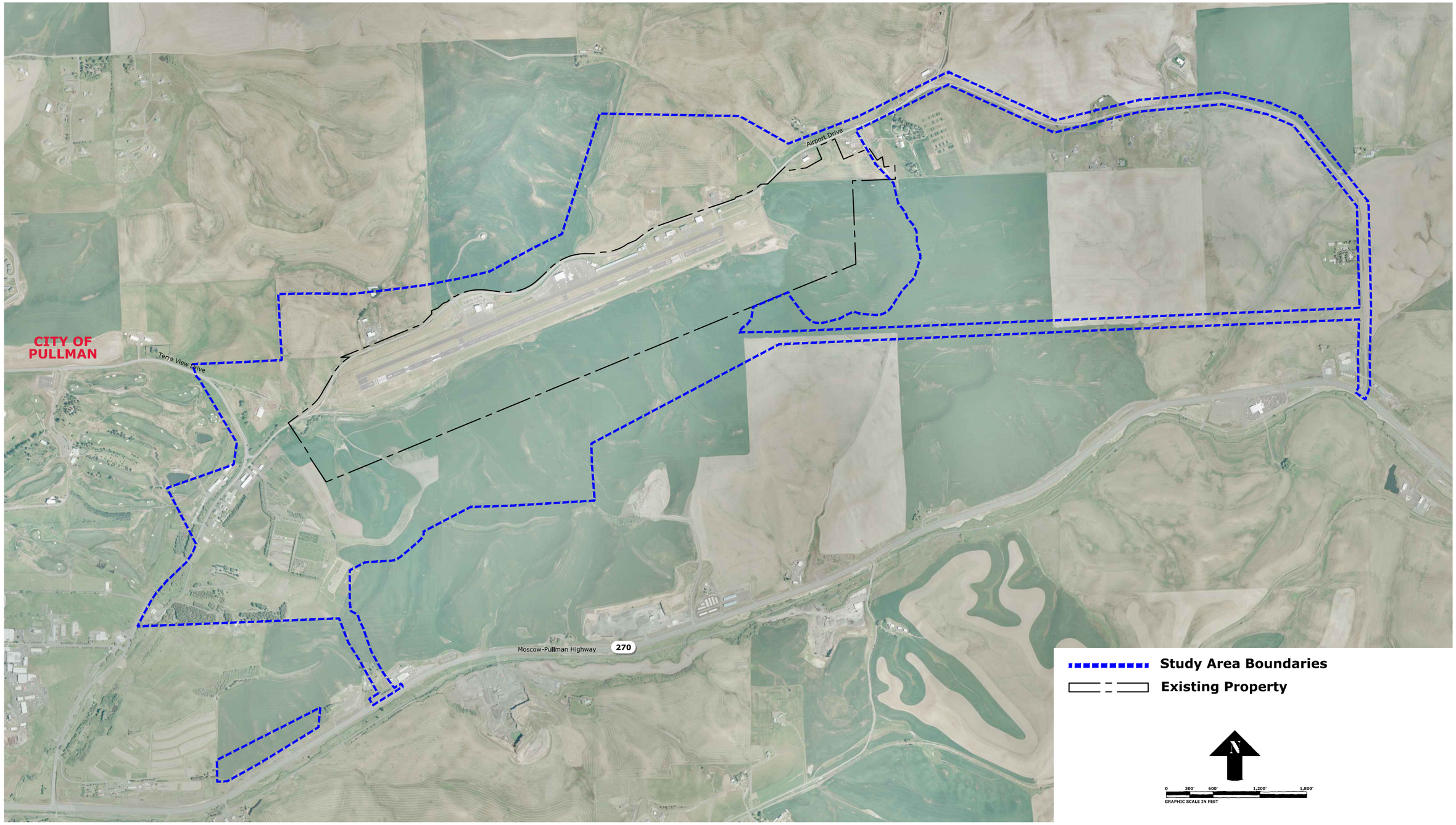


Figure 4-1
Study Area

Implementation Plans, which reflect plans by the state for how to achieve (and maintain) compliance with the NAAQS.

According to FAA Environmental Orders, an airport action is subject to General Conformity requirements only if it would occur in a nonattainment or maintenance area. The EPA designated Whitman and Latah Counties as being within attainment for all NAAQS, with no pollutant maintenance areas. Therefore, General Conformity of the Clean Air Act does not apply based on the guidance.

4.3 CLIMATE

Greenhouse gases result primarily from the combustion of fuels. Greenhouse gas pollutants are defined as including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF6). CEQ and FAA guidance indicate that greenhouse gas pollutants can serve as a reasonably proxy for assessing potential climate change. Additionally, research has shown that there is a direct correlation between fuel combustion (such as aircraft fuel) and greenhouse gas emissions. Therefore, the existing conditions relate primarily to the existing aircraft operations at the Airport (combustion of aircraft fuel), as detailed previously in Chapter 2, Purpose and Need.

Research has shown there is a direct correlation between fuel combustion and greenhouse gas emissions. In terms of U.S. contributions, the General Accounting Office reports that "domestic aviation contributes about 3% of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20%) and power generation (41%).[1] The International Civil Aviation Organization (ICAO) estimates that greenhouse gas emissions from aircraft account for roughly 3% of all anthropogenic greenhouse gas emissions globally.[2] Climate change due to greenhouse gas emissions is a global phenomenon, so the affected environment is the global climate.[3]

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in greenhouse gas emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating Federal agencies (e.g., National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), EPA, and the Department of Energy), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global

[1] *Aviation and Climate Change.* GAO Report to Congressional Committees, (2009). http://www.gao.gov/new.items/d09554.pdf

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

[3] Federal Aviation Administration (FAA) Order 1050.1E, Change 1, Guidance Memo #3, *Considering Greenhouse Gases and Climate Change Under the National Environmental Policy Act (NEPA): Interim Guidance*, January 2012.

and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the ICAO.[4]

4.4 COASTAL RESOURCES

The closest coast to Pullman-Moscow Regional Airport is located approximately 430 driving miles away. Consequently, there are no coastal resources located on or within close proximity to the proposed project.

4.5 COMPATIBLE LAND USE AND ZONING

Existing land use patterns typically follow an established zoning code, with the exception of those areas that are currently vacant and for which future development is contemplated under the existing zoning. According to the *City of Pullman Zoning Code*, the Pullman-Moscow Regional Airport property is identified as Commercial (Title 17 of the *City of Pullman, Washington Code*, current through October 2013) (see **Figure 4-2,** *City of Pullman Zoning*). Areas north, east, and south of the Airport are not within Pullman city limits. North of PUW are scattered residences and a few businesses; areas east and south of the Airport are generally in agricultural use. WSU, which borders the Airport to the southwest, is identified as its own zoning code (WSU district). The WSU district includes the Palouse Ridge Golf Course, as well as WSU agricultural research buildings, a WSU-owned orchard named the Tukey Orchard, crops and access roads. **Figure 4-3,** *WSU Land Uses West of the Airport* depicts the multiple WSU land uses that are located in the study area. **Table 4-1,** *WSU Land Uses West of the Airport* provides brief descriptions for each of these land uses.

The *City of Pullman Zoning Code* includes a special category for Overlay Zone Districts, which regulates uses in zone districts where unique or unusual circumstances warrant additional or specific standards. An Airport Overlay District is identified for the area around the Airport. The Airport Overlay District provides special consideration for areas around the Airport by regulating land use, height of structures and trees and marking and lighting of obstructions near the airport. The Airport Overlay Districts include two types of subdistricts: the Airport Height Limitation Overlay Districts and the Airport Use Restriction Overlay District. The Airport Height Limitation Overlay District regulates airport hazards by controlling the height of structures and trees, based on language in Title 14, Part 77 of the FAA Federal Regulations. The Airport Use Restriction Overlay District prohibits certain land uses, including residential, childcare, educational, hospital and church uses, in areas where the existing or potential airport-related noise levels exceed 65 DNL (day-night average). These zoning identifications ensure compatibility between the Airport and surrounding land uses and protects the Airport from incompatible encroachment.

[4] Lourdes Q. Maurice and David S. Lee. *Chapter* 5: *Aviation Impacts on Climate.* Final Report of the International Civil Aviation Organization (ICAO) Committee on Aviation and Environmental Protection (CAEP) Workshop. October 29th - November 2nd, 2007, Montreal. http://www.icao.int/icaonetIcnfrstICAEP/CAEP SG_20082/docs/Caep8_SG2_ WPI0.pdf

Table 4-1: WSU Land Uses West of the Airport	
Land Use Type	**Description**
Animal Science	There are two buildings associated with Animal Sciences along Airport Road and Terra View Drive. A larger building is used for storing farm equipment and provides shop space for vehicles to be worked on. There is also office space in this building. A smaller building is used for farm equipment storage.
Horticultural and Landscape Architecture	Horticultural activities include 70.36 acres of Tukey Orchard with an additional 5,648 sqft of supporting facilities, and 398 sqft of weather station facilities. The orchard is for members of the WSU faculty, staff and students to do teaching, research, and/or extension work.
USDA Animal Disease Research Unit	The USDA facilities on Terre View Drive provide isolation spaces so that animal disease research can occur while not infecting healthy animals.
USDA Western Region Plant Introduction Service	These facilities are used for research on germplasm to provide new genes to improve our crops in the US.
Veterinary Medicine	The veterinary medicine uses are associated with the Agricultural Animal Health Program (AAHP) Field Disease Investigation Unit (FDIU) at WSU.
Natural Resource Sciences	The Natural Resource Science uses include research and demonstration opportunities for academic disciplines such as botany, conservation biology, endangered species conservation (both plants and animals), horticulture, restoration ecology, wildlife ecology, and landscape architecture and design.

The *City of Pullman Comprehensive Plan* (updated 1999) establishes the community's vision for the future. According to the Plan, the City of Pullman identifies land surrounding the Airport (currently located within unincorporated Whitman County) as being part of the City's Urban Growth Area (UGA). The UGA identifies areas that the City plans to annex and potentially develop in the next twenty years. While the Comprehensive Plan identifies the airport environs included in the UGA as future commercial zoning, the Plan also specifies a goal to limit development within the UGA in order to maintain efficient municipal service delivery and farmland preservation.

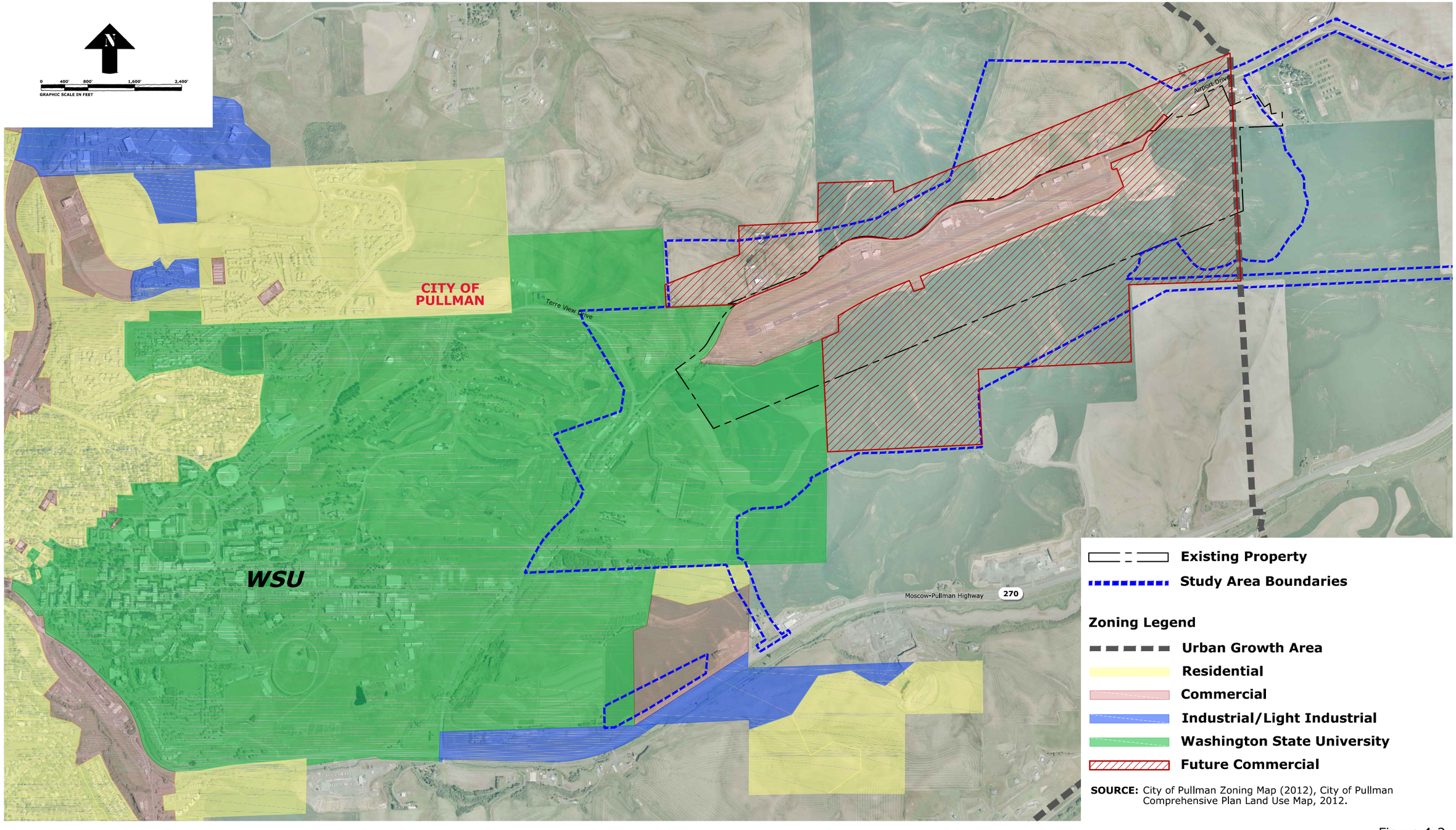


Figure 4-2
City of Pullman Zoning Map

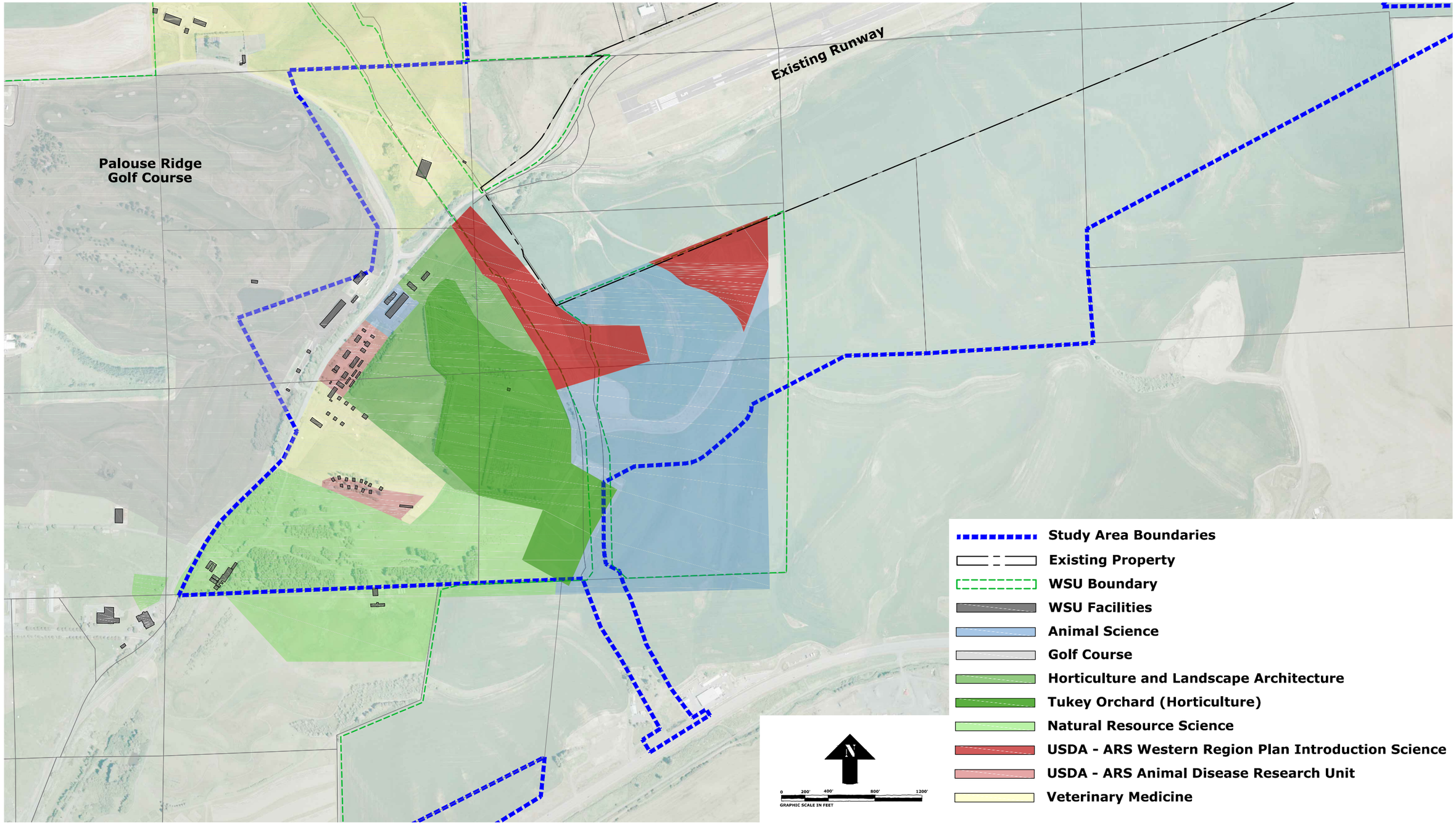


Figure 4-3
WSU Land Uses West of Airport

4.6 DEPARTMENT OF TRANSPORTATION ACT: SECTION 4(F)

Section 4(f) of U.S. Department of Transportation (DOT) Act of 1966 (recodified and renumbered as section 303(c) of 49 U.S.C.) dictates that the Secretary of Transportation shall not approve any program or project that requires the use of any publicly owned land from a public park, recreation area or wildlife and waterfowl refuge, or historic site of National, State, or Local significance, unless there is no feasible and prudent alternative to the use of such land. If it is not possible to find a feasible and prudent alternative, the project must include all possible planning to minimize the potential impact.

There are no wildlife or waterfowl refuges located within close proximity to the Pullman Moscow Regional Airport. A trail identified in the City of Pullman trail system runs along Terra View Road, Ring Road and Airport Road, just west of the Airport within the proposed RPZ. Additionally, a portion of one hole and the maintenance equipment storage building for WSU's Palouse Ridge Golf Course are located within the proposed RPZ. Both the trail and the golf course are public recreational facilities, and therefore qualify as Section 4(f) resources.

4.7 FARMLANDS

Consultation with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) is required to determine if the Farmland Protection Policy Act (FPPA) applies to any land to be converted from non-agricultural use as a result of the proposed action. Under the FPPA, the U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS) defines farmlands, as follows:

- **Prime Farmland:** Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It can economically produce sustained high yields of these crops when treated and managed according to acceptable farming practices. Prime farmland, as defined by the FPPA, does not include land already committed to urban development or water storage, or land that is located within urban areas that are developed, specifically with impermeable (paved) surfaces.
- **Unique Farmland:** Land other than prime farmland that is used to produce specific high value food and fiber crops. It can economically produce sustained high yields of these specialized crops when treated and managed according to acceptable farming practices.
- **Farmland of Statewide Importance:** Land that has been identified by criteria determined by the Colorado State Experiment Station, the Colorado State Department of Agriculture, and the Colorado State Soil Conservation Board.
- **Farmland of Local Importance:** Land that has not been identified as having national or statewide importance yet may have local significance based on the goals of the community and of the various agricultural enterprises that maintain a viable agricultural community.

To determine whether any prime or unique farmland soils or farmland soils of statewide or local importance are present in the study area, data were downloaded from the 2014 NRCS Soil Data Mart database. **Figure 4-4**, *Farmlands*, shows that soils around PUW are classified as either farmland of statewide importance or prime farmland (with or without contingency). However, although the soil types indicate that land is prime

farmland or farmland of statewide importance, the FPPA states that farmland does not include land already in or committed to urban development. Therefore, soils that are already located on Airport property, and have been dedicated to Airport uses, are not covered under the FPPA.

4.8 WILDLIFE AND VEGETATION

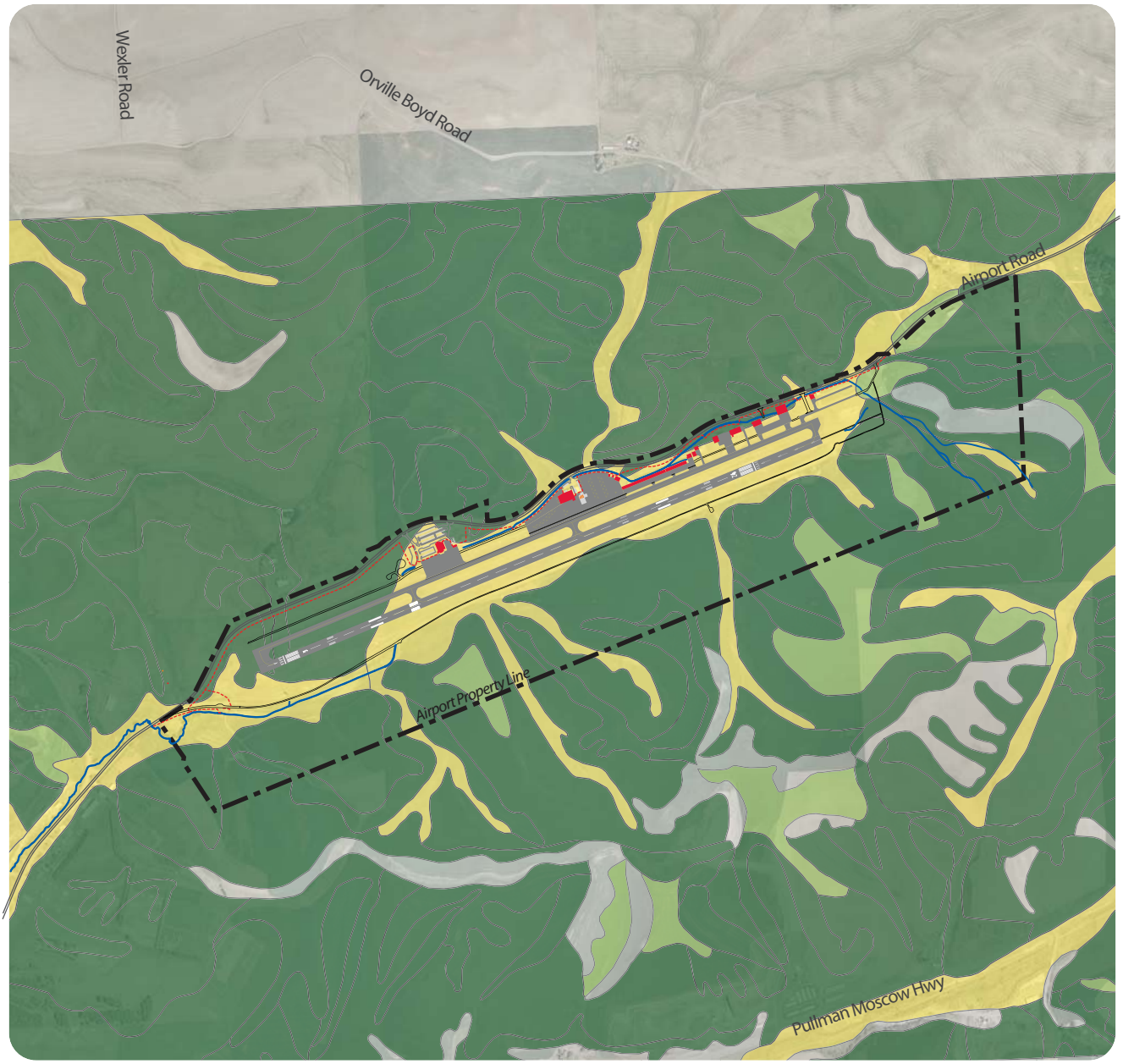
The Airport is situated in a low gradient valley/floodplain surrounded by rolling Palouse foothills covered by planted wheat fields. Southwest of the Airport, WSU maintains a well maintained 18-hole golf course and several agricultural research fields. A large percentage of the vegetative communities that surround the Airport are non-native species. The most prevalent vegetation assemblages contained in the Airport's general vicinity include: dryland wheat (*Triticum spp*), ornamental turf grasses, several species of fruit trees, and smooth brome (*Bromus inermis*).

Airport Creek traverses through the Airport property. Hydrophtyic vegetation linked to the creek and associated fringe wetlands are dominated by reed canary grass (*Phalaris arundinacea*), cattail (*Typha latifolia*), teasel (*Dipsacus fullonum),* and sparsely scattered hawthorn (*Crataegus douglasii*) and willows (Salix spp.),

Wildlife known to frequent the Airport and surrounding vicinity include the following species: black-billed magpie (*Pica hudsonia*), California quail (*Callipepla californica*), Canada goose (*Branta canadensis*), common raven (*Corvus corax*), coyote (*Canis latrans*), crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), killdeer (*Charadrius vociferous*), mallard (*Anas platyrhynchos*), mourning dove (*Zenaida macroura*), northern flicker (*Colaptes auratus*), red-tailed hawk (*Buteo jamaicensis*), red-winged blackbird (*Agelaius phoeniceus*), ring-necked pheasant (*Phasianus colchicus*), robin (*Turdus migratorius*), western meadowlark (*Sturnella neglecta*) and white-tailed deer (*Odocoileus virginianus*).

The U.S. Fish and Wildlife Service (USFWS) defines an endangered species as one that is in danger of extinction within all or a significant part of its natural range. A threatened species is a species identified as one that will likely become endangered within the foreseeable future.

In accordance with the requirements of Section 7(c) of the Endangered Species Act (ESA), a Biological Assessment (BA) was prepared in September 2013 to assess potential impacts that could result from the Proposed Action (see **Appendix F**). The Study Area defined for the BA comprises 1,152 acres in and around the Airport, including the project footprint as well as all areas surrounding the footprint that could potentially be affected by the improvements. Site reviews and pedestrian surveys were conducted for the assessment in October and November of 2012 and April and July of 2013.



Legend

- Prime Farmlands
- Prime Farmland if Drained
- Farmland of Statewide Importance

SOURCE: *USDA NRCS Web Soil Survey, 2014.*

N

Scale 1" = 1,500'

Figure 4-4 **Farmlands**

According to BA, there are three ESA-listed species and one designated critical habitat listed on the USFWS countywide list within Whitman County. In addition, three state-listed species of concern were identified based on data from the Washington State Department of Fish and Wildlife (WDFW) and consultation with the Washington Natural Heritage Program. **Table 4-2**, *Summary of Listed Species and Designated Critical Habitat*, summarizes these listed species and their statuses.

Table 4-2: Summary of Listed Species and Designated Critical Habitat

	Listed Species or Critical Habitat	Status
ESA Listed Species	Bull trout (*Salvelinus confluentus*)	Threatened
	Bull Trout Designated Critical Habitat	Threatened
	Spalding's catchfly (*Silene spaldingii*)	Threatened
	Ute ladies'-tresses (*Spiranthes diluvialis*)	Threatened
State-Listed Species	Palouse goldenweed (*Pyrrocoma liatriformis*)	Threatened
	Palouse milk-vetch (*Astragalus arrectus*)	Threatened
	Swainson's hawk (*Buteo swainsoni*)	Monitor

Source: U.S. Fish and Wildlife Service (USFWS) countywide species listing for March 15, 2012; Washington State Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) report, generated December 5, 2012.

It should be noted that the WDFW Priority Habitats and Species data reflects that the Study Area contains "palustrine/aquatic habitats." Airport Creek, an intermittent stream channel, and several contributing ephemeral streams, as well as fringe wetlands, are located within the Study Area.

According to the BA, the Study Area contains very low to no ecological valued habitat due to three reasons: (1) the study area is adjacent to and largely within the existing airport operational area, or contains land-uses linked to WSU or cultivated fields (all of these land uses yield high percentages (>99%) of non-native habitat); (2) there is a lack of contiguous undisturbed native vegetative communities; and (3) the existing airport operations coupled with the ongoing farming practices in the area are generally not conducive to promoting viable wildlife habitat.

4.9 FLOODPLAINS

Executive Order 11988 directs Federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains. Based upon the available Flood Insurance Rate Map (FIRM) for Whitman County, Washington, much of the Airport is located within Federal Emergency Management Agency (FEMA) Flood Zone A. Flood Zone A designates an area as being subject to inundation by a 1-percent-annual-chance flood event, or a 100-year floodplain. However, because FEMA flood maps do not feature

flood elevations or have an accompanying hydraulic model, a HEC-RAS hydraulic model was developed based on current topography and published flood flows in order to estimate flood storage quantities and flood conveyance velocities on the Airport (see **Figure 4-5**, *Existing Floodplains*). These floodplains are located throughout the Airport property and along Pullman Airport Road/Terre View Drive.

As the floodplains at PUW are identified as a Zone A, the area has neither produced water surface elevation data nor has a floodway been identified. According to 44 CFR Ch1, Section 60.3(b), the following regulatory requirements apply for a construction project like the Proposed Action (i.e. for a project that is located in a flood-prone area, where the FEMA FIRM designates areas of special flood hazards, but the areas have neither produced water surface elevation data nor identified floodways):

- Notify adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse; and,
- Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained.

4.10 HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

Four primary federal laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances, and wastes. The statutes most relevant to airports and the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA) (as amended by the Federal Facilities Compliance Act of 1992), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund), and the Community Environmental Response Facilitation Act of 1992. RCRA governs the generation, treatment, storage and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment. The EPA keeps detailed information on all businesses dealing with hazardous materials, water discharge, Superfund sites, toxic releases and air emissions.

Handling and disposal of hazardous materials is stringently regulated by federal, state and local agencies. Hazardous materials, also referred to as dangerous goods, are any solid, liquid or gas that can harm people, other living organisms, property or the environment. These materials may be radioactive, flammable, explosive, toxic, corrosive, a biohazard, an oxidizer, an asphyxiate, a pathogen, an allergen or may have other properties or characteristics that deem it hazardous in specific circumstances.

A Phase I Environmental Site Assessment (ESA) was prepared in 2013 in support of this EA (see **Appendix G**). The Study Area for the Phase I ESA includes 943 acres on and off airport property that could potentially be disturbed by the proposed improvements. According to a search of federal and state databases, there are 24 potentially hazardous waste sites within one mile of the Airport; six of which

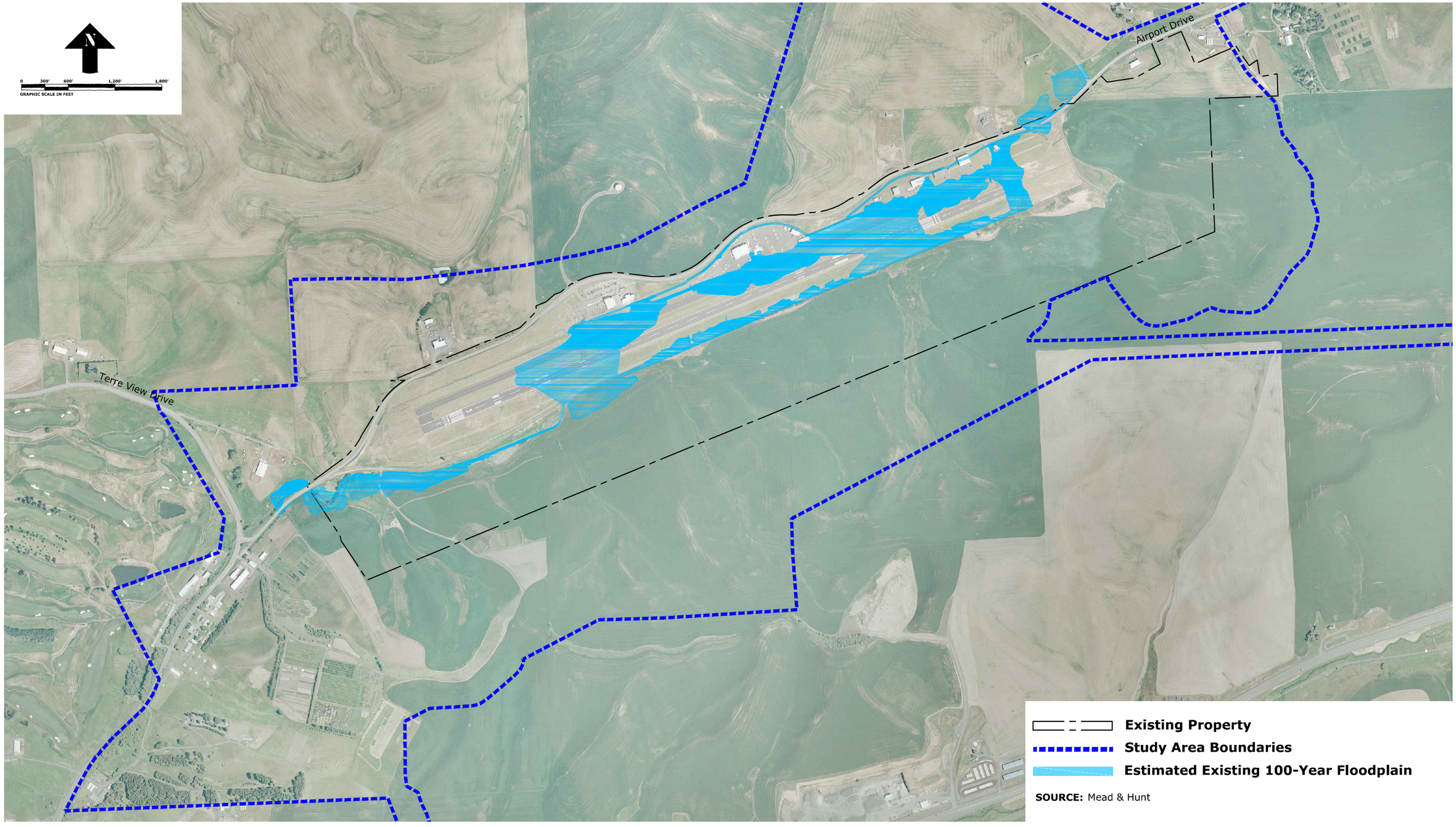


Figure 4-5
Floodplains

are located within 0.25 miles from the Airport. Two sites were identified as being on Airport property. One of the sites is a former underground storage tank (UST) that was closed and has been removed. The other site on airport property indicates that the Transportation Security Administration (TSA) has a "small quantity generator," which is expected to generate less than 100 kilograms of hazardous material per month. This site is identified as low risk. The Phase I ESA did not identify any significant hazards at the Airport.

A landfill owned by WSU is located approximately 900 feet from the study area. The landfill consists of two trenches that are approximately 10 feet wide and 30 feet long and contain low level radioactive and chemical waste. The site was discovered in 1979 and was listed as hazardous in 1990. A remediation plan was completed in 1998. The site is classified by the U.S. Environmental Protection Agency and Washington Department of Ecology as low risk and is awaiting cleanup.

Pullman Disposal Service collects solid waste from the Airport once a week. There are no compactors located onsite.

4.11 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

The National Historic Preservation Act of 1966 (NHPA) requires a review to determine if any properties within the environmental impact area of the proposed action are included in or eligible for inclusion in the National Register of Historic Places (NRHP). The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery and preservation of significant scientific, pre-historical, historical, archaeological or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally funded or federally licensed project.

Section 106 of the NHPA requires Federal agencies to consider the impact of their undertaking on properties included in or eligible for inclusion in the NRHP. Compliance with Section 106 requires consultation with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer (SHPO), and/or the Tribal Historic Preservation Officer (THPO) if there is a potential adverse effect to properties which are in or eligible for listing in the NRHP.

The Area of Potential Effect (APE) consists of the area where direct and indirect impacts from the Proposed Action may occur and cause a change in historic, architectural, archaeological or cultural properties. The APE is considered the study area for analysis of historic resources. The APE for the Proposed Action encompasses areas directly affected by ground disturbance activities and property acquisition (both by easement and fee simple), as well as areas indirectly affected by potential noise or visual effects from the project. Four cultural resources in the APE were identified as being eligible for listing in the NRHP (see **Figure 4-6**, *APE and Historical Resources*).

Surveys of the APE for cultural resources were conducted in November and December of 2012 and April and May of 2014 (see **Appendix H**, *Cultural Report*). The objective of these surveys and the report was to determine if archaeological or historical resources are present within the APE and, if so, to complete an evaluation to determine if they qualify for inclusion in the National Register; to determine if the proposed project would have any adverse effects to properties that qualify for listing in the National Register; and, if so, to resolve any adverse effects for review under NHPA.

Four Federally recognized Indian tribes have ties to Whitman County: the Coeur d'Alene Tribe; the Confederated Tribes of the Colville Reservation, Washington; the Nez Perce Tribe; and the Spokane Tribe of the Spokane Reservation, Washington[5]. Consultation with Native American tribes recognizes the government-to-government relationship between the United States government and sovereign tribal groups. In that context, federal agencies must acknowledge that historic properties of religious and cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands beyond modern reservation boundaries.

4.12 LIGHT EMISSIONS AND VISUAL ENVIRONMENT

The Pullman-Moscow Regional Airport is surrounded by rolling hills, typical of the Palouse area. South of the Airport, agricultural land extends to Highway 270. The existing Avista Energy Corridor stretches east to west across this area. North of the Airport, residences, businesses, and a church are scattered among agricultural uses and rolling topography. For the most part, these properties have unimpeded views of the landscape. Topographical features including rolling hills often block mid-ground views, but provide scenic foreground and background viewsheds for the homes. Homes located along Airport Road have foreground views of the road with mid- and background viewsheds of rolling hills.

Airfield lighting and rotating beacons are the main sources of light emissions emanating from an airport. Airport visual and electronic aids consist of instruments and equipment that assist pilots with navigation on the airfield and within the vicinity of the airport while in flight. The airfield at PUW is equipped with the following visual and electronic aids:

- White/green rotating beacon
- Lighted wind sock and segmented circle
- Runway End identifier lights (REILs)
- Precision approach path indicator (PAPI) lights
- Runway 05: 2-box, 3-degree glidepath
- Runway 23: 4-box, 4-degree glidepath
- High intensity runway edge lighting (HIRL)

[5] Native American Consultation Database, U.S. Department of the Interior, accessed December 12, 2013, http://grants.cr.nps.gov/nacd/NACD_Search_Page_Query_Results.cfm

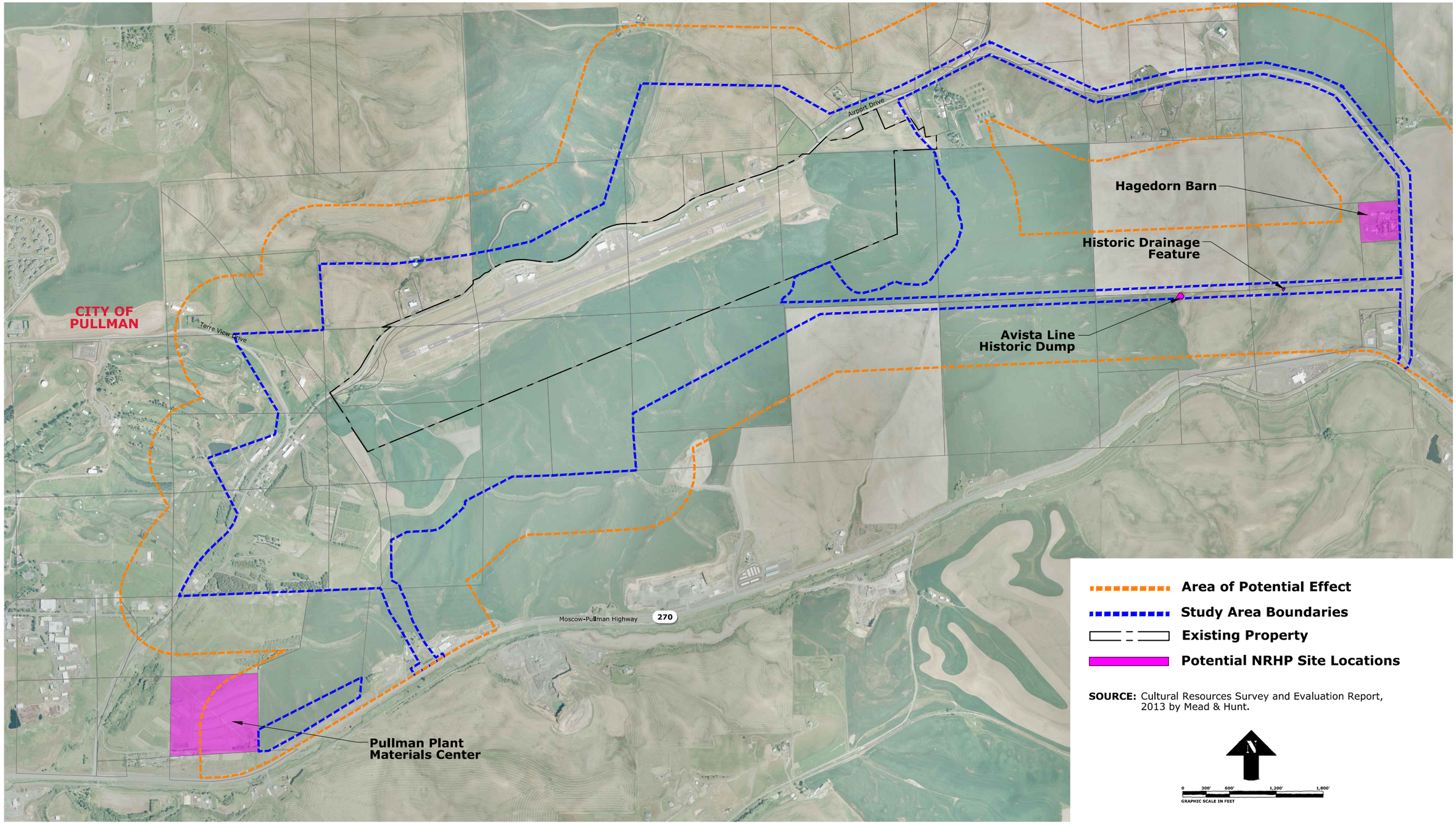


Figure 4-6
APE & Historical Resources

Runway 6/24 is currently equipped with a standard lighted airfield signage system. This system includes guidance signs indicating relative position on the airfield and runway distance remaining signs.

4.13 NATURAL RESOURCES AND ENERGY SUPPLY

Avista provides electrical service to the Airport. The Airport also has a backup generator system to provide electrical service in the event of a power outage. Natural gas is also provided by Avista. A gas pipeline runs alongside Airport Road to the east of the Airport (and beyond Airport property).

Fuel storage is handled by the Fixed Base Operator (FBO), Inter-State Aviation. The Airport aircraft fueling facility is located in the middle of the general aviation ramp just north of the Taxiway "C" connection. Currently, the facility has two tanks (12,000 gallons each) of Jet A aircraft fuel, one tank (12,000 gallons) of 100 low lead aircraft fuel, and one tank (4,000 gallons) of auto fuel. The tanks were installed in 2009. The FBO offers both full service refueling via fuel trucks and self-fueling.

4.14 NOISE

Aircraft-related noise exposure for the No Action Alternative and Proposed Action was defined through the use of noise contours prepared with the FAA's Integrated Noise Model (INM). The INM is a FAA approved software program used to model the noise exposure levels from aircraft operations and produce contours of equal noise exposure for selected points on the ground. These contours are presented using the 65 Day Night Average Sound Level (DNL) noise contour metric, where 65 DNL represents "noise impacted" areas. DNL metric measures the overall noise experienced during an entire (24-hour) day. DNL calculations account for the sound exposure level of aircraft, the number of aircraft operations and a penalty for nighttime operations. In the DNL scale, noise occurring between the hours of 10:00 p.m. to 6:59 a.m. is penalized by 10 dB. This penalty was selected to account for the higher sensitivity to noise in the nighttime and the expected further decrease in background noise levels that typically occur at night. DNL provides a numerical description of the weighted 24-hour cumulative noise energy level using the A-weighted decibel scale, typically over a period of a year.

INM requires information concerning the number of aircraft operations, the types of aircraft (fleet mix), the time of day (day or night) that activity occurs, runway utilization patterns and the typical flight tracks of aircraft. Existing aircraft noise contours for Pullman-Moscow Regional Airport were developed using these data. The existing noise contours are presented in **Figure 4-7**, *Noise Contours*. Future contours are based on forecast without the project at the existing airport. Noise contours for 65 DNL were generated for existing (2013) and future (2018 and 2023) conditions. The year 2018 represents the opening year of the project; the year 2023 represents five years hence with the operation of the facility. The 65 DNL contours are contained within Airport property for both existing and future conditions. The compatibility of existing and proposed land uses with aircraft noise generated at the Airport are further discussed in **Chapter 5**, *Environmental Consequences*.

4.15 SOCIOECONOMIC ENVIRONMENT, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

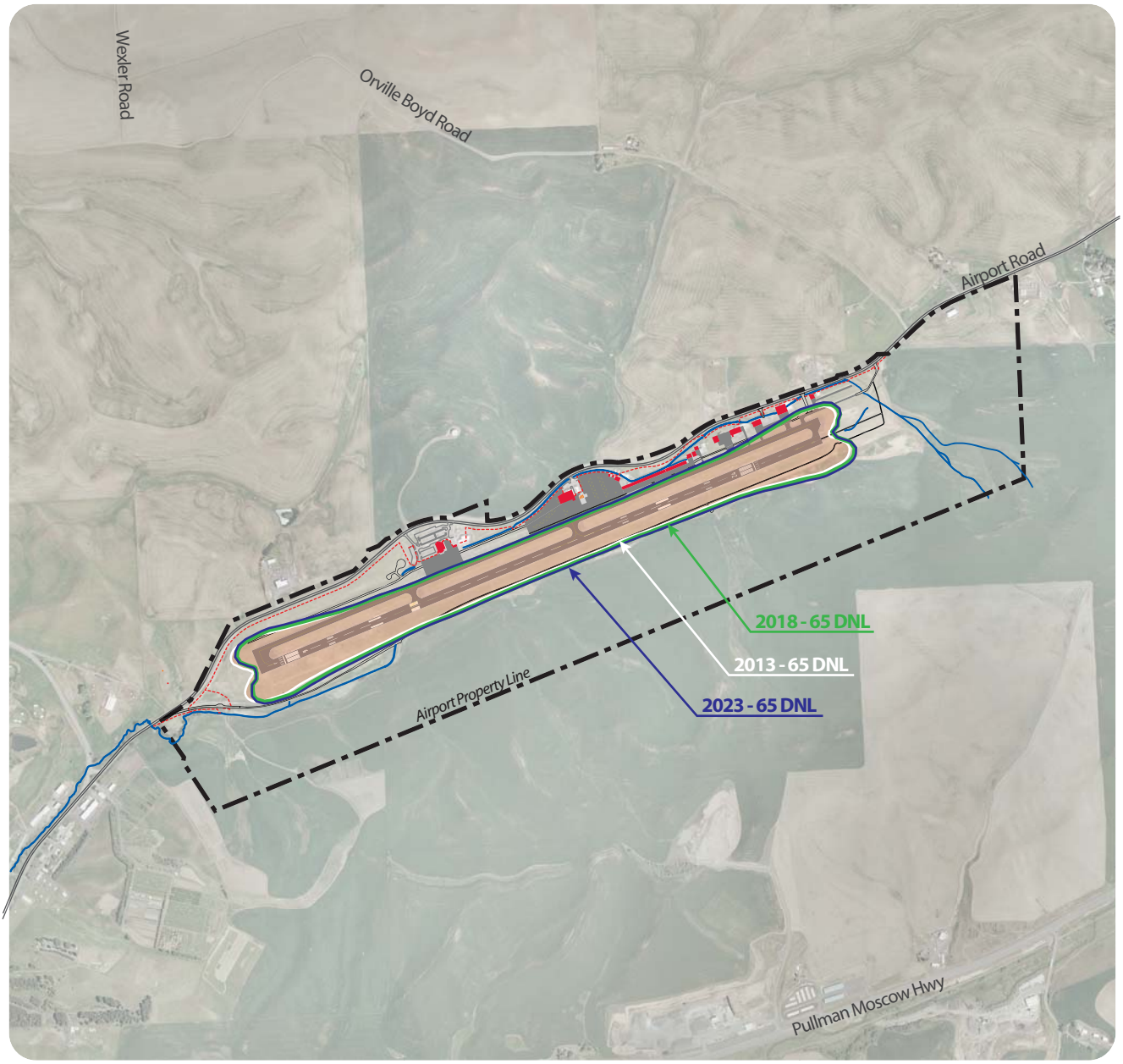
4.15.1 Environmental Justice

Environmental justice is a public policy goal of promoting the fair treatment and meaningful involvement of all people in the decision-making process. Satisfying this goal means ensuring that minority and low-income communities receive an equitable distribution of the benefits of a project without suffering disproportionate adverse impacts. The environmental justice evaluation helps to determine whether the proposed action would result in an inequitable distribution of negative effects to minority, special ethnicity or low-income population groups. Environmental justice is examined during evaluation of other impact categories, such as noise, air quality, water, hazardous materials and cultural resources. This analysis complies with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and the Department of Transportation (DOT) Order 5610.2, *Order to Address Environmental Justice in Minority Populations and Low-Income Populations.* According to DOT Order 5610.2, a disproportionately adverse impact is defined as one that is:

1) Predominantly borne by a minority population and/or 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 effect that will be suffered by the non-minority population and/or low income population.

DOT Order 5610.2 also states that any disproportionate impacts on these populations should be avoided, if practicable, unless the avoidance of these impacts would result in other significant impacts to social, economic or environmental resources.

According to the American Community Survey (2008-2012), Pullman has a population of approximately 29,895 and Moscow, Idaho has a population of approximately 23,866. Population, racial, educational, housing and income statistics are shown in the **Table 4-3**, *Demographic Statistics: Pullman, Washington and Moscow, Idaho*.



SOURCE: *Noise Contours: Mead & Hunt*

Figure 4-7 **Noise Contours**

Table 4-3: Demographic Statistics: Pullman, Washington and Moscow, Idaho			
Facts	**Pullman, WA**	**Moscow, ID**	**United States**
Population	29,895	23,866	309,138,711
Persons under 5 years old (percent)	3.4%	5.4%	6.5%
Persons under 18 years old (percent)	11.2%	16.2%	23.9%
Persons 65 years old and over (percent)	4.0%	7.3%	13.2%
Female persons (percent)	49.4%	47.6%	50.8%
White persons (percent)	79.8%	91.3%	74.2%
Black persons, percent	3.0%	1.1%	12.6%
American Indian and Alaska Native persons, percent	0.3%	0.5%	0.8%
Asian persons, percent	10.8%	2.8%	4.8%
Native Hawaiian and other Pacific Islander, percent	0.4%	0.1%	0.2%
Persons reporting two or more races, percent	5.0%	3.3%	2.7%
Persons of Hispanic or Latino origin, percent	5.9%	4.1%	16.4%
Percent high school graduate or higher	97.5%	96.2%	85.7%
Percent bachelor's degree or higher	67.6%	52.7%	28.5%
Housing units	11,783	10,063	131,642,457
Vacant housing units, percent	13.9%	5.5%	12.5%
Median value of owner-occupied housing units	$227,000	$204,300	$181,400
Average household size	2.45	2.18	2.58
Per capita income, 2011	$17,351	$18,844	$28,051
Median household income, 2011	$24,125	$30,790	$53,046
Individuals below poverty level	44.0%	29.7%	14.9%

Source: U.S. Census, American Community Survey, 5-year estimates 2008-2012.

According to these data, the minority population percentages in Pullman and Moscow are generally smaller than the national average percentage, while the percentages of people below poverty in these cities are greater than that of the US. **Figure 4-8**, *Percent of Individuals Below Poverty* and **Figure 4-9**, *Percent Minority* illustrate these data in more detail within and around the Airport by Census Block Group and Census Block, respectively.

4.15.2 Socioeconomic Environment

The cities of Pullman and Moscow are the largest cities in their respective counties, Whitman County and Latah County. Since 2000, the cities of Pullman and Moscow have increased in population by approximately 21% and 12%, respectively. Because of the local universities located in each city, the percent of people (age 25 and over) that have a bachelor's degree or higher is much larger than that of the US (see **Table 4-3**).

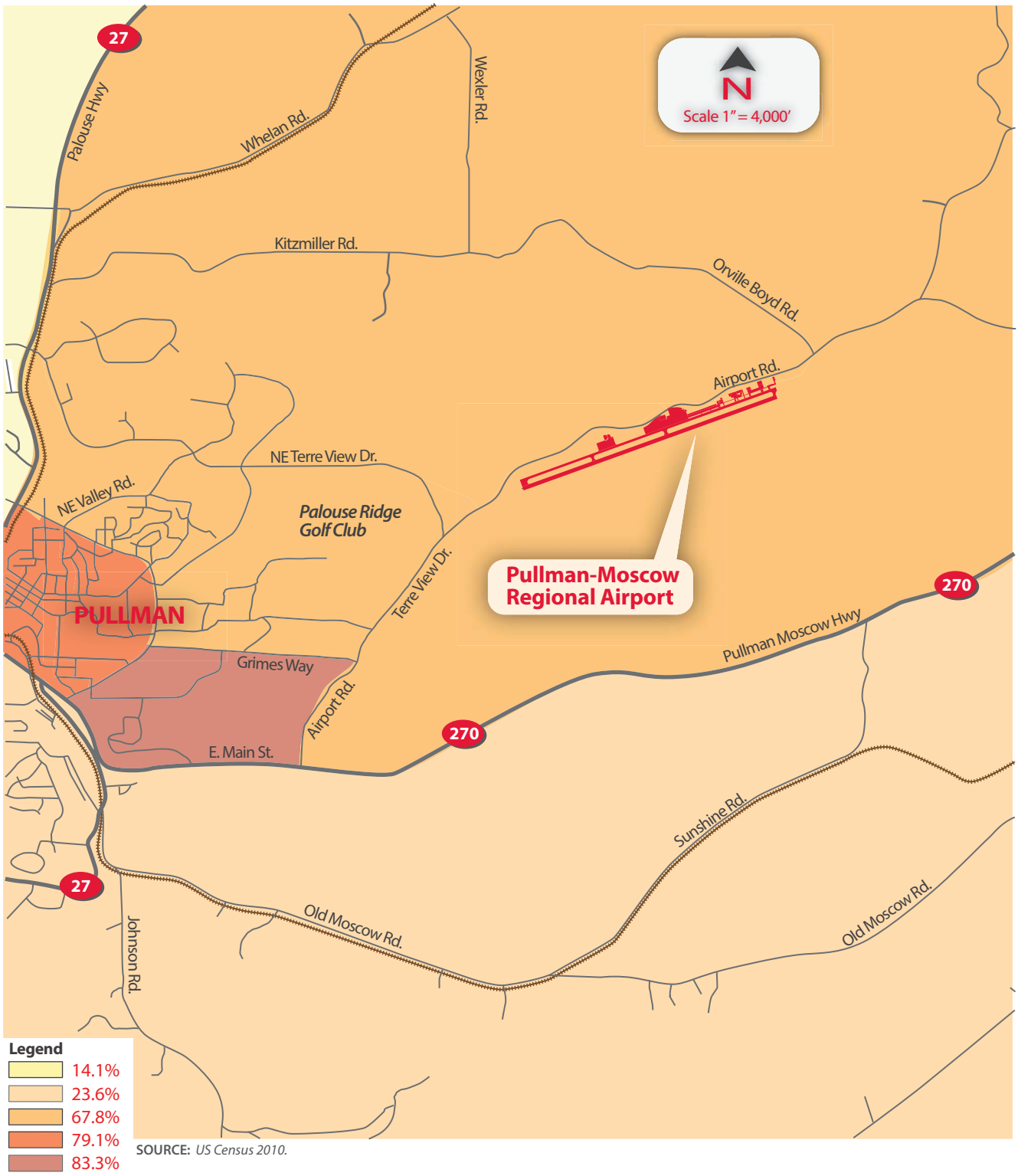
According to the Southeast Washington Economic Development Association (SEWEDA) 2013 Comprehensive Economic Development Strategy, the economy in Whitman County is driven primarily by government services and retail trade. Growing sectors of advanced technology, renewable energy, and tourism offer the potential for economic growth in the region. Latah County's economy is based primarily in government services, retail trade, health care and food service industries (City of Moscow Data Center, 2013) .

Housing statistics from the 2008-2012 American Community Survey show that Pullman and Moscow have approximately 11,783 and 10,063 housing units, respectively. The homeownership rate, or the proportion of households that are owners, often explains the relative permanence of residents. The homeownership rates for Pullman (30.0%) and Moscow (39.9%) are below that of the US (65.5%). This difference can be attributed to a large portion of the populations being students.

4.15.3 Children's Environmental Health and Safety Risks

Executive Order 13045, *Protection of Children from the Environmental Health Risks*, directs Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Agencies are encouraged to participate in implementation of the Order by ensuring that their policies, programs, activities and standards address disproportionate risks to children resulting from environmental health risks or safety risks.

The closest schools to the Airport (aside from the universities) are Jefferson Elementary School in Pullman (approximately 2.6 miles southwest of the Airport) and Logos School in Moscow (a Christian kindergarten through high school six miles east of PUW). The schools are not currently affected by airport operations and are located outside of the 65 DNL airport noise contour.



SOURCE: *US Census 2010.*

Figure 4-8 **Percent Below Poverty**

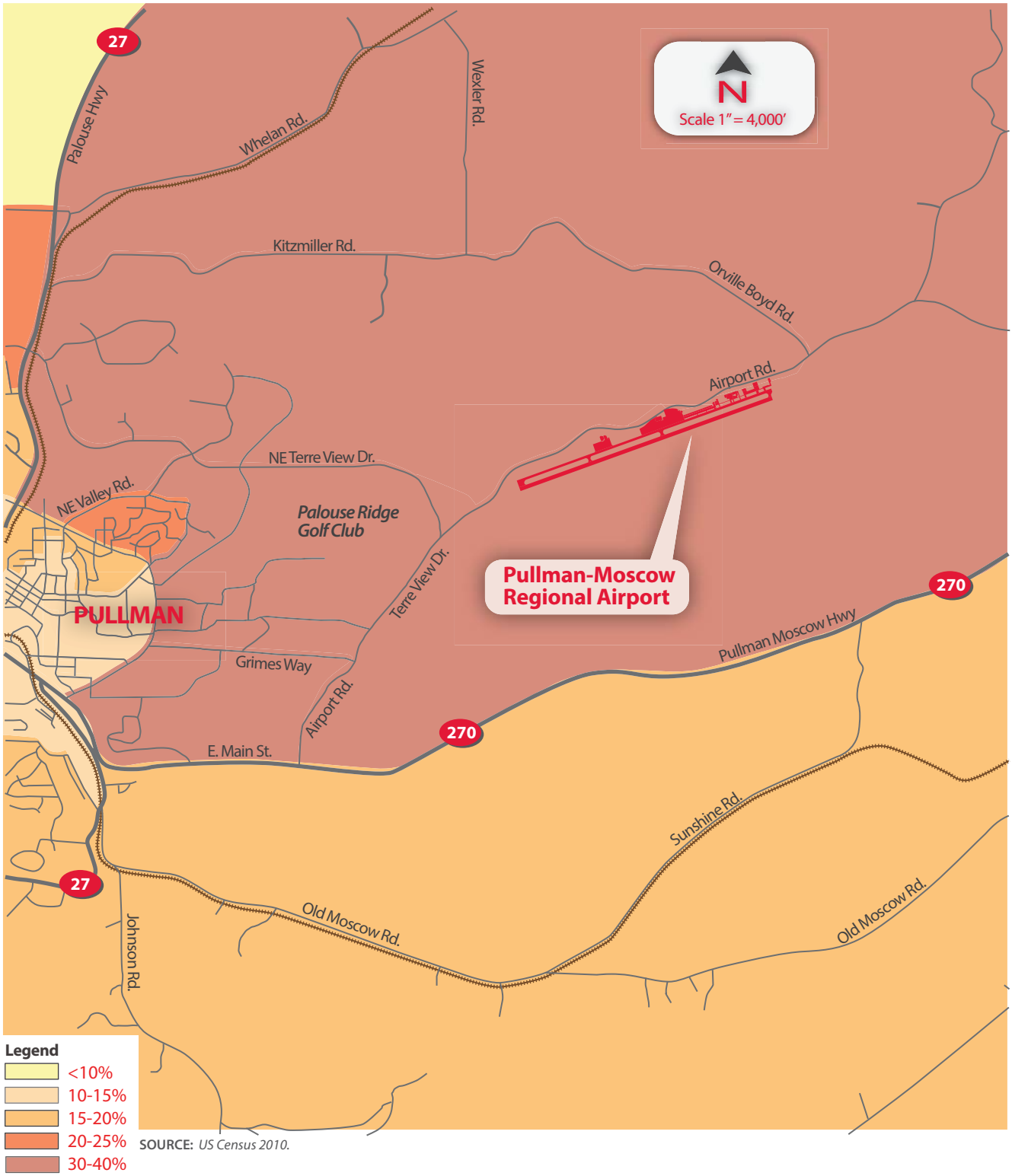


Figure 4-9 **Percent Minority**

4.16 WATER QUALITY

Several components associated with water quality are relevant to project considerations and have been addressed as part of this assessment. The primary hydrological components within the study area that have been addressed include: surface waters conditions (i.e. within Airport Creek and ephemeral channels), stormwater management (with primary concern associated with transportation of contaminants), and water sources (specifically with regard to water wells and surface water diversions). The following sections detail pertinent baseline/existing conditions regarding these water quality considerations.

The primary waterway within the study area is Airport Creek, which flows from the northeast to the southwest, and ultimately drains into Paradise Creek near the intersection of Airport Road and SR 270. Airport Creek is part of the South Fork Palouse River Watershed and Water Resource Inventory Area (WRIA) # 34 - Palouse. Due to the hydrological conditions near the study area, the majority of the water supply sources onsite have been developed by utilizing groundwater resources in the form of water wells.

The federal Clean Water Act (CWA) governs most aspects of water quality in the United States. Section 303(d) of the CWA requires states to prepare lists of waters for which technology-based effluent limitations (and other required controls) are not effective enough to comply with water quality standards. Impaired waters identified by the 303(d) list frequently have Total Maximum Daily Load (TMDL) regulations developed and implemented. TMDL refers to the allowable amount of a specific pollutant that a water body may receive without exceeding water standards. The Washington State Department of Ecology (DOE) completed a TMDL for fecal coliform bacteria for the South Fork Palouse River watershed, which includes the Airport Creek drainage. The U.S. Environmental Protection Agency (EPA) approved this TMDL in January of 2010. This TMDL stipulates that an 84% to 93% reduction of bacteria at the mouth of Airport Creek is necessary for this stream to meet Washington State water quality standards. DOE is in the process of developing several new TMDLs that would address temperature, dissolved oxygen, and pH impairments within the South Fork Palouse River watershed. Once approved by the EPA, it is conceivable that the new TMDLs would yield requirements applicable to Airport Creek and the anticipated modifications to the drainage layout.

The Airport stormwater system is currently covered under the National Pollutant Discharge Elimination System (NPDES) through Ecology's Industrial Stormwater General Permit (ISGP). The most recent version of the ISGP was modified on May 16, 2012, and will expire on January 1, 2015. The stormwater infrastructure at PUW is subject to the federal regulations for surface drainage design[6] and hazardous wildlife attractants.[7] According to AC 150/5320-5D, "The objective of storm drainage design is to provide for safe passage of vehicles or operation of the facility during the design storm event. The design of appropriate discharge facilities for storm water collection and conveyance systems includes consideration of storm water quantity and quality. Local, state, and/or Federal regulations often control the allowable

[6] Federal Aviation Administration (FAA) 2013, *AC 150/5320-5D, Airport Drainage Design, August 15, 2013*.

[7] Federal Aviation Administration (FAA) 2007, *AC 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, August 28, 2007*.

quantity and quality of storm water discharges. To meet these regulatory requirements, storm drainage systems will usually require detention or retention basins, and/or other best management practices (BMPs) for the control of discharge quantity and quality."

Along with CWA regulations and FAA Advisory Circulars, water resource protection associated with the Airport is provided by these state and local regulations:

- WDOE, *Stormwater Management Manual for Eastern Washington, September 2004.*
- WDOE, *ISGP, May 16, 2012.*
- Washington State Legislature. *Water Code.*
- Washington State Legislature. *Regulation of Public Groundwaters*.
- City of Pullman. 2012. *City of Pullman Design Standards 2012 Edition.*

Regulations set forth to control ground waters within Washington are detailed in RCW 90.44 and are supplemental to chapter 90.03. RCW 90.44 includes information regarding definitions, limitations, permits/certificates, exceptions, penalties, and other topics pertaining to ground water regulations.

The Airport drainage system consists of a combination of surface and underground conveyances, generally draining from northeast to southwest via two drainage ways which parallel the runway. Airport Creek flows through the Airport from northeast to southwest. In ordinary low flow conditions, the main stem of Airport Creek flows in an open channel with a number of culvert crossings along the north side of the runway, and is parallel to Airport Road. Airport Creek then enters an underground pipe on the east side of the terminal, runs under the terminal apron and then crosses the airfield daylighting to an open channel again on the south side of the airfield. Airport Creek continues westward until leaving airport property and crossing in a culvert under Airport Road at the west end of the Airport.. In flood conditions, the creek flow splits at the northeast end of the runway and the local water course to the south becomes part of the mapped floodplain. The Airport stormwater system was originally constructed with a network of 12 inch storm drain piping and was designed to discharge into Airport Creek. The hillside to the south drains to the local water course to the south. The hillside to the north drains to Airport Road and crosses the road connecting to the main stem of Airport Creek in a few culverts adjacent to the Airport.

The industrial activities on the Airport, such as aircraft fuelling and deicing, are permitted by Ecology's ISGP. BMPs are implemented to reduce pollution potential.

Current deicing operations occur within a designated de-icing area that is located on the terminal apron. A minimum amount of deicing is done in the ramp area to reduce the potential of stormwater contamination. To further prevent pollution stemming from deicing and other industrial activities, a series of Best Management Practices (BMPs) have been adopted into the Airport's Stormwater Pollution Prevention Plan (SWPPP), a requirement of Ecology's ISGP. The BMPs implemented in the SWPPP are in accordance with the "Stormwater Management Manual for Eastern Washington." Major aspects of the BMPs relate to restricting deicing operations to impervious containment areas, conveying spent chemicals in accordance

with an agency approved plan, storing deicing chemicals in approved containment areas, and other practical measures to mitigate pollution impacts stemming from deicing.

Spent glycol discharges in aircraft application areas are process wastewaters that are regulated under Ecology's ISGP. In a letter dated March 9, 1992, a citizen made a complaint to the Ecology, regarding a suspicion of a spill/leak at the Airport. An investigation that followed the complaint discovered that Horizon Air's de-icing operation was causing ethylene glycol to enter a storm drain between the terminal building and the Aircraft Rescue Firefighting (ARFF) building. In response to this containment issue, the Airport and Horizon have made several improvements in order to address the problem. These efforts include: installation of a trench drain in 1998 that was designed to intercept runoff from the deicing area and discharge into a no-outlet grassy swale for soil treatment; and, changing the deicing chemical from the previously used toxic ethylene glycol to a non-toxic, non-hazardous, biodegradable propylene glycol. The trench drain that was installed is located between the terminal apron and the northern taxiway, and slopes from east to west toward the grassy swale. Within the grassy swale that the trench drain discharges into, there is a resource monitoring well that is registered to the Airport that can be used to evaluate treatment effectiveness.

There have been several areas where water claims within the study area have been utilized to divert surface water to be used for irrigation; however, these sources are greatly outnumbered by the amount of wells that are currently in use in the study area (see **Figure 4-10**, *Water Wells*) .

In addition to privately held wells, the Airport has two separate water systems that provide drinking water. The first is provided by WSU in a 10-inch line to the Terminal and the ARFF facilities. This system is supplied by off-site wells that are owned and operated by the University. The second system is owned by the City of Pullman. It is served by an 80-foot deep well located adjacent to the FBO building. This system serves the FBO and a majority of the private hangars to the east. The remaining private hangars have their own wells.

There are no municipal sanitary sewerage systems within the vicinity of the Airport. The Terminal, ARFF and FBO facilities are connected to a drain-field located just west of the terminal site. All other hangars use local drain fields for disposal. Private hangars are responsible for maintenance and replacement per lease agreement requirements.

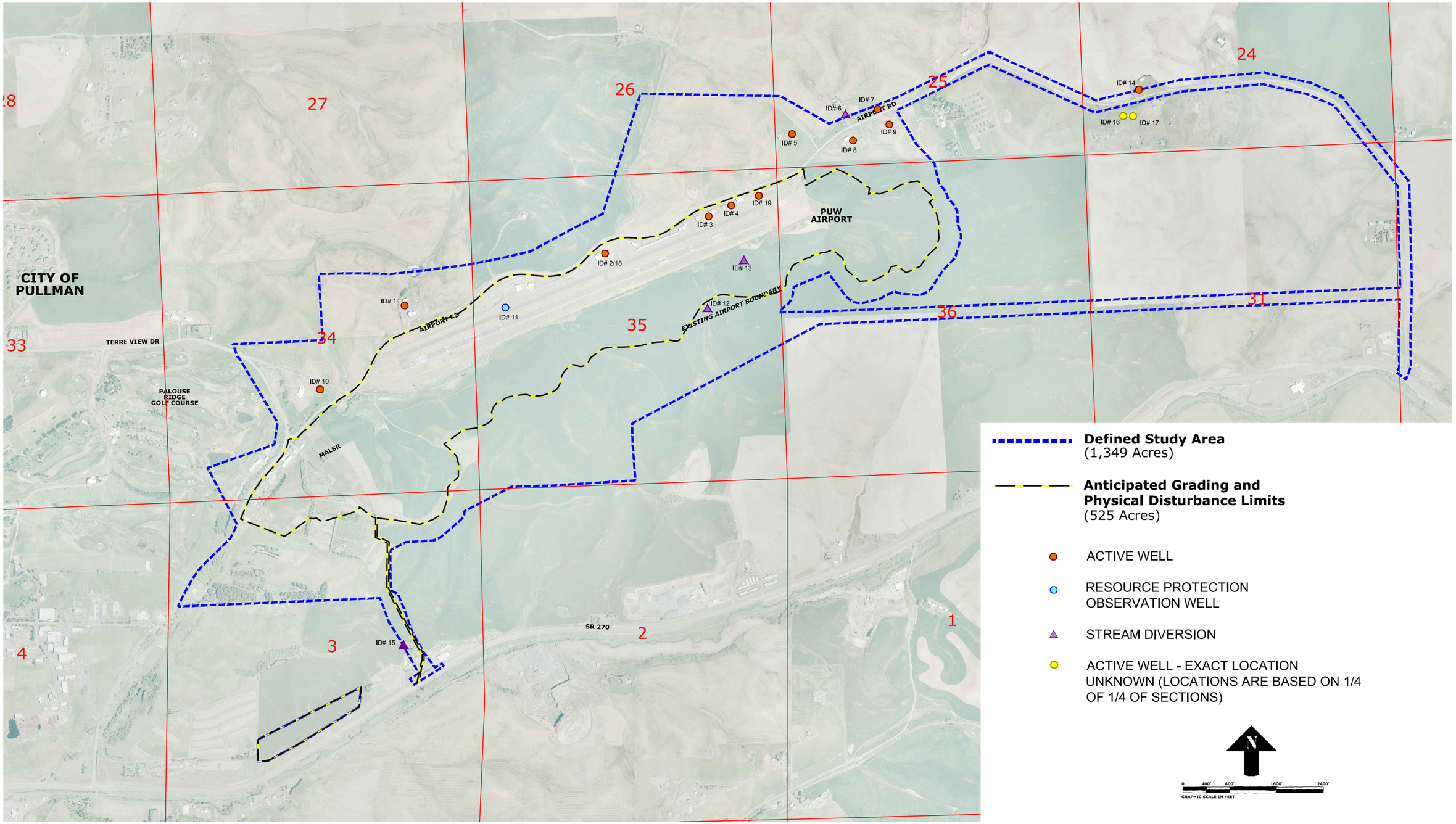


Figure 4-10
Water Wells

4.17 WETLANDS AND WATERS OF THE UNITED STATES

Executive Order 11990, *Protection of Wetlands*, and DOT Order 5660.1A, *Order on Preservation of the Nation's Wetlands*, require Federal agencies to avoid and minimize the impact of construction projects on wetlands. A detailed site survey was conducted to document the presence of wetlands and streams located on the Airport property. Detailed survey information and wetlands analysis is included in the Wetland Delineation Report in **Appendix I.**

Wetlands are defined as areas inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction. Waters of the US are within the jurisdiction of the US Army Corps of Engineers (USACE) pursuant to the Clean Water Act. Waters of the US includes waters that are used or could be used for interstate commerce. This includes wetlands, ponds, lakes, territorial seas, rivers, tributary streams including any definable intermittent waterways and some ditches below the Ordinary High Water Mark (OHWM). Also included are manmade water bodies such as quarries and ponds that are no longer actively being mined or constructed. Wetlands, mudflats, vegetated shallows, riffle and pool complexes, coral reefs, sanctuaries and refuges are all considered special aquatic sites that involve more rigorous regulatory permitting requirements. A specific and more detailed definition of Waters of the US can be found in the Federal Register (33 CFR 328.3).

Initiating northeast of the Airport, Airport Creek flows along Airport Road and the northern boundary of the Airport property. It then routes under Runway 5 and continues along the south side of the Airport property boundary. Several ephemeral streams and fringe wetlands are hydrologically connected to Airport Creek. Airport Creek and the connected un-named streams and wetlands are considered Waters of the United States (Waters of the US) and alterations to these features are regulated by the USACE.

According to the National Wetlands Inventory (NWI) Map, there is a potential for wetlands near the Airport. In 2009, a 350-acre study area linked to the preliminarily-anticipated footprint of the proposed runway improvements at the Airport was delineated and surveyed. This Wetland Delineation Report was approved by the USACE on January 27, 2010. The approved jurisdictional determination (USACE Reference # NWS-2009-1281) is valid until January 27, 2015. This Wetland Delineation Report was amended in 2014 to become a technical report supporting the NEPA process for this EA (see **Appendix I**). The amended report identified, delineated, surveyed and mapped the wetlands and streams located within the expanded 1,349-acre study area, which encompassed several project actions comprising the Proposed Action. The USACE approved this amended Wetland Delineation Report on July 7, 2014. The most recent approved jurisdictional determination (USACE Reference # NWS-2009-1281) is valid for five years (i.e. until July, 2019).

The Amended Wetland Delineation Report identified three types of wetlands and two types of streams within the study area (see **Figure 4-11**, *Wetlands and Waters of the US*). **Table 4-4**, *Wetlands and Waters of the US within the Study Area,* summarizes the identified wetland and stream features within the 1349-acre study area.

Table 4-4: Waters / Wetlands within the Study Area	
Feature Type	**Total Acreage within Study Area**
Riverine (Category II) Wetlands	20.3 acres
Depressional (Category III) Wetlands	2.0 acres
Sloped (Category IV) Wetlands and Ephemeral Channels	22.0 acres
Airport Creek (Type F Stream)	15,709 linear feet

Source: Amended Wetland Delineation Report/Memo, J-U-B Engineers, 2014 (see Appendix I).

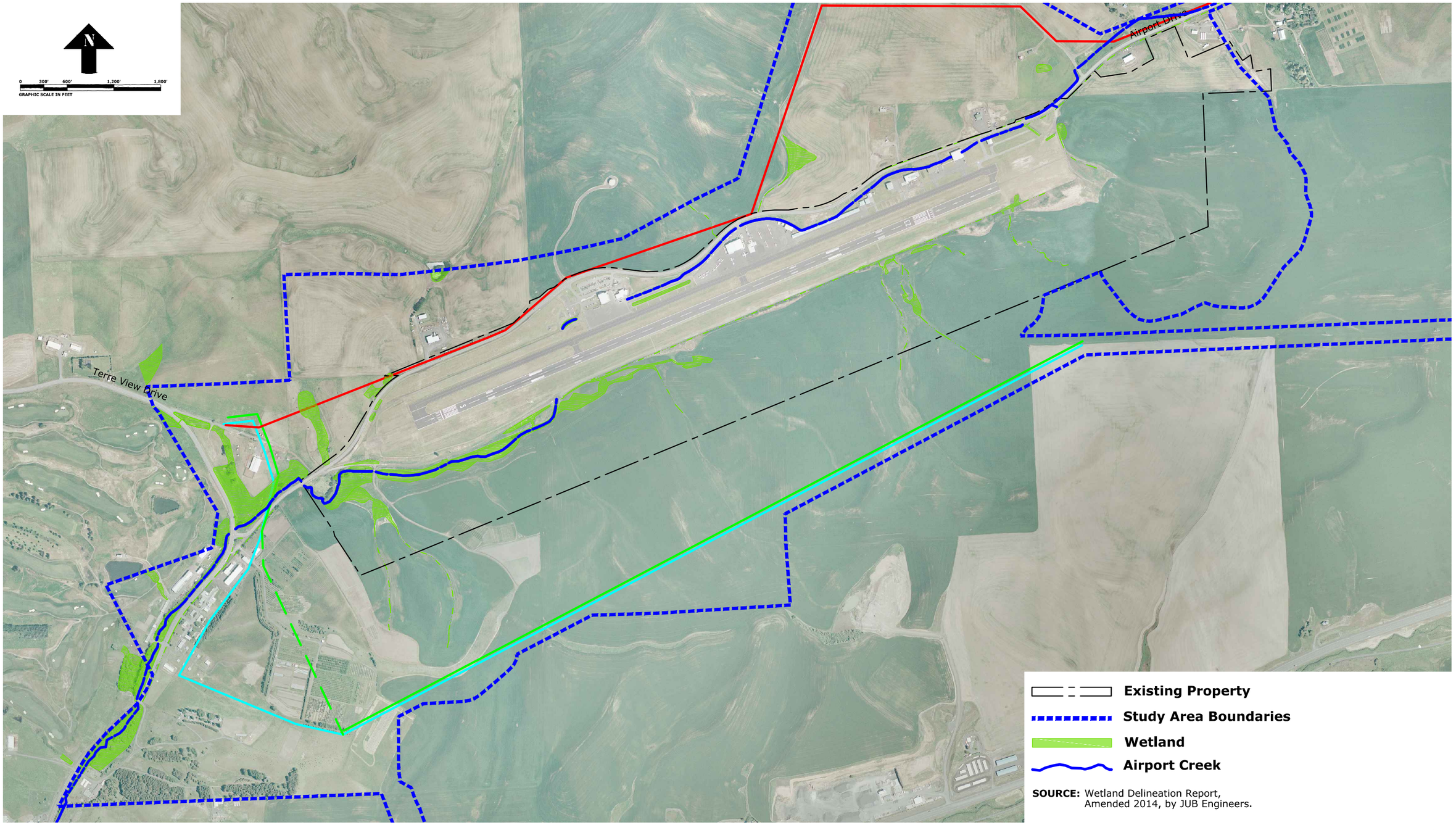


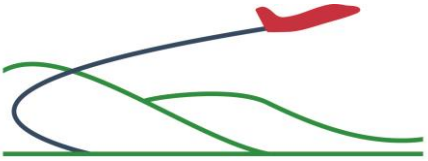
Figure 4-11
Wetlands

4.18 WILD AND SCENIC RIVERS

According to a listing of Wild and Scenic Rivers compiled and managed by the USACE, the BLM, the National Park Service, the U.S. Forest Service and the USFWS, there are no wild and scenic rivers located within the vicinity of Pullman-Moscow Regional Airport.

Chapter 5 Environmental Consequences

FINAL ENVIRONMENTAL ASSESSMENT



Chapter 5 Environmental Consequences

This chapter outlines the potential environmental consequences associated with implementing the No Action Alternative or the Proposed Action. Chapter 3, *Alternatives*, describes these options in detail. Briefly, the alternatives are described below.

The No Action Alternative would retain the existing runway and its current non-standard dimensions with no improvements. The runway length would remain at 6,700 feet and the existing runway width and runway-taxiway separation distance would remain at non-standard dimensions for C-III aircraft. This alternative would not reduce approach minimums and would not meet FAA design standards for C-III aircraft.

The PUW Proposed Action would include a southward shift and counterclockwise rotation of the runway to meet FAA design standards for C-III aircraft. A new taxiway would be constructed and both the runway and taxiway would meet the recommended length of 7,100 feet. The Proposed Action would be capable of providing an approach from the west with standard Category I approach minimums with ½ mile visibility and 200-foot decision height, thereby improving all-weather reliability. Additionally, the Proposed Action would include a new terminal at a new location along the realigned runway to accommodate for existing and future demand.

CONNECTED ACTION: AVISTA ENERGY CORRIDOR

Currently, the above-ground Avista Energy Corridor is located south of the existing runway. In its current location the utility corridor would cross the proposed new runway at mid-field and the new parallel taxiway near the west end. The obstruction presented by an above ground utility corridor would be incompatible with the operations of a runway. Therefore, relocation of the Avista Energy Corridor must be completed as part of the Proposed Action.

Several options were developed and analyzed for the relocation of the Avista Energy Corridor. The options include routes both north and south of PUW. Both above ground and underground options were considered due to height restrictions and compatible land use requirements in the vicinity of the Airport. Options were established and evaluated based on criteria that included impacts to the future airspace, future runway protection zones, the environment and various land uses on and around the Airport. Below are descriptions of the options considered for the relocation of the Avista Energy Corridor.

Avista Energy Corridor Relocation - South Route Above Ground Option: The South Route Above Ground option would keep the energy corridor on the south side of the Airport. This option would utilize existing Avista facilities crossing through the agricultural fields until a point 1,750 feet south of the proposed new runway centerline (see **Figure 5-1,** *Avista Energy Corridor Relocation Options*). The newly constructed portion of the corridor alignment would travel parallel to the runway centerline. This positioning would remove any obstructions created by the Avista Energy Corridor from the primary and transitional surfaces

of the proposed new runway. At approximately 1,100 feet beyond the west end of the proposed new runway, the energy corridor would turn northwest, at which point it would turn northeast. Once the Avista Energy Corridor would reach the northwest side of the Airport, the energy corridor would tie back to the existing Avista facilities.

This route would have the second least impact on airspace that effects navigational procedures to and from the Airport and to Part 77 airspace. **Table 5-1,** *Avista Alternatives Comparison*, summarizes the airspace penetrations that would result from this route. The most critical airspace impacts are those to approach and departure surfaces. This route would result in only 2 penetrations to the Approach surface based on current survey data. However, survey completed to a higher degree of accuracy will likely resolve the conflicts. The remaining airspace penetrations are located in the horizontal surface outside of the primary and transitional surfaces of the Part 77 airspace. It has been determined that these penetrations can be mitigated through lighting of structures and installing high visibility markers on the lines. Temporary construction airspace penetrations are also noted in **Table 5-1**, *Avista Alternatives Comparison*, and this route would result in the second highest number of temporary airspace penetrations. However, this option provides the best opportunity to mitigate surface penetrations during construction and reduce the potential for impacts to airport operations.

This route maximizes the use of the existing alignment and shifts the Avista facilities south on the same property that is already impacted by the existing route and is in agricultural use. The route would cross the RPZ close to the end of the proposed new runway and would pass through the MALSR[1] approach lighting of the new runway. The FAA has stated that co-location of the MALSR and Avista Utility would be permissible. This segment of the route would be located on land to be acquired from WSU which is currently in agricultural use and is needed for other components of the project. This route would not introduce residential, commercial, or industrial uses into the utility corridor.

Relocation of the Avista Energy Corridor south of the Airport would take advantage of a shorter amount of new construction associated with the relocation of the alignment by utilizing a large portion of the existing transmission facilities already in place, thereby saving time and costs. This route would cost $4.1 million.

Avista Energy Corridor Relocation – South Route Partial Underground Option: The South Route Underground option is a combination of above ground facilities in conjunction with an underground segment. The above ground portion uses the same facilities as the Above Ground option (Segment B and portions of Segment A shown in **Figure 5-1,** *Avista Energy Corridor Relocation Options*) until approximately 1,100 feet west of the proposed runway end. Rather than the utilities traveling through the proposed Runway Protection Zone (RPZ) above ground, this alternative extends the utilities underground

[1] The **MALSR (Medium Intensity Approach Lighting System With Runway Alignment Indicator Lights)** is a medium approach intensity lighting system (ALS) installed in airport runway approach zones along the extended centerline of the runway. The MALSR, consisting of a combination of threshold lamps, steady burning light bars and flashers, provides visual information to pilots on runway alignment, height perception, role guidance, and horizontal references for Category I Precision Approaches.

along Segment C and then reverts back to above ground facilities (the location Segments C is shown in **Figure 5-1,** *Avista Energy Corridor Relocation Options*).

This route would result in similar impacts on airspace as the South Above Ground Option. **Table 5-1,** *Avista Alternatives Comparison,* summarizes the airspace penetrations that would result from this route. The primary airspace differences between the two South Options is the underground route removes the two approach penetrations identified with the current survey data but adds a departure surface penetration. However, the removal of the approach surface penetrations is insignificant because a higher degree of survey accuracy is expected during design which will likely eliminate the conflict with the South Above Ground Option.

Land use considerations for this route are nearly identical to the South Above Ground Option. The only difference is that Segment C which travels through the RPZ will be underground, eliminating the need to collocate the utility with the MALSR.

This route would cost $9.1 million which is the highest of all three options. The underground segment significantly adds to the overall cost of this option while reducing the useful life of the corridor. Maintaining and repairing underground utilities is also more expensive which will increase the cost of this option over time.

Avista Energy Corridor Relocation - North Route Option: The North Route option would travel across the north side of the Airport. This option would begin where the existing Avista Energy Corridor crosses Airport Road near the intersection of Highway 270. The alignment would follow Airport Road around the north side of the Airport and would require a new utility easement. At the intersection of Airport Road and Orville Boyd Road, the alignment would turn north along Orville Boyd Road in order to avoid impacts to residential properties and to minimize penetrations to the Part 77 surface along this portion of the alignment. The alignment would then turn due west to cross an agricultural field, entering low terrain that would take advantage of minimizing penetrations to the Part 77 airspace. The alignment would then turn south to reach Airport Road, then turn west to travel the rest of the way along Airport Road until it would tie into existing Avista utilities (see **Figure 5-1,** *Avista Energy Corridor Relocation Options*).

This route would have the highest number of permanent airspace conflicts with approach and departure surfaces, Part 77 approach surface penetrations, and present the greatest challenge to mitigate temporary construction conflicts. **Table 5-1,** *Avista Alternatives Comparison,* summarizes these conflicts. The temporary construction conflicts are significant with 44 total penetrations. Construction phasing would require that the Avista Energy Corridor be temporarily relocated for up to two years before the new runway becomes operational adding additional cost. This option also has the highest risk associated with temporary or long term closures of the existing runway during construction because of airspace conflicts.

This route would introduce a high voltage transmission line within 300 feet of 5 residential structures, 1 neighborhood, and 4 commercial structures. Most of the properties along this route currently enjoy high

quality view sheds with views of the topography. The poles would interrupt existing views of the local topography and could degrade the scenic value of these properties. Therefore, it is expected that residential properties along Airport Road would incur visual impacts as a result of the North Route Option.

The North Route option would be considerably longer than the proposed routes south of the Airport. Consequently, this option would amount to greater alignment relocation costs due to longer routes that utilize less of the existing Avista facilities. This option would have the highest easement costs and is the mid-range (between the other Options) for construction. The North Route is expected to cost $6.9 million.

SUMMARY OF AVISTA ENERGY CORRIDOR RELOCATION OPTIONS

All of the Avista Energy Relocation Options discussed above would avoid crossing the proposed runway and parallel taxiway at mid-field, and thereby would reduce land use incompatibilities with the operation of the new runway. Each option was evaluated further to determine the best route for the relocated energy corridor. **Table 5-1,** *Avista Alternatives Comparison,* provides a summary evaluation of the options considered.

The North Route Option increases the complexity of construction due to the 44 temporary penetrations which may limit operations on the existing runway during construction and also introduces residential and commercial land use into the utility corridor which would have an adverse impact to the view shed of adjacent properties. The North Route Option has the highest potential for difficulty in obtaining lease agreements with impacted property owners due to the visual impacts. This option also has the second highest cost ($6.9 million) which includes $1.4 million for temporary construction costs. For these reasons, this option was dismissed from further consideration.

As **Table 5-1,** *Avista Alternatives Comparison* indicates, the South Above Ground and Partial Underground Options have comparable airspace penetrations and both would not introduce residential or commercial land uses into the utility corridor. Penetrations associated with the south options could be mitigated through lighting of structures and installing high visibility markers on the lines. The differentiator between the two south options is cost. The South Partial Underground Option would cost $9.1 million and would cost more to maintain over its useful life. The South Above Ground Option would cost $4.1 million, the least of all three options. Therefore, the South Partial Underground Option was dismissed from further consideration and the South Above Ground Option was carried forward for further evaluation.

Potential effects of the No Action and Proposed Action, including the relocation of the Avista Energy Corridor, are evaluated for each environmental resource in accordance with *FAA Order 1050.1E, Environmental Impacts: Policies and Procedures* and *FAA Order 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions*. A detailed alternatives evaluation is included in **Appendix J**.

Table 5-1: Avista Alternatives Comparison				
		North Route Above Ground Option	**South Route Above Ground Option**	**South Route Partial Underground**
Airspace / Airport Facilities				
Approach Penetration	Temporary	4	7	4
	Proposed	0	2	0
Departure Penetration	Temporary	14	4	5
	Proposed	4	0	0
RNAV Z Penetration	Temporary	0	1	1
	Proposed	0	0	0
Part 77 Transitional Penetration	Temporary	22	2	2
	Proposed	0	0	0
Part 77 Horizontal Penetration	Temporary	2	11	11
	Proposed	1	10	10
Part 77 Approach Penetration	Temporary	2	2	3
	Proposed	3	0	0
Proximity (Passes within 300' of)				
Residential Structure		5	0	0
Residential Developments / Neighborhoods		1	0	0
Commercial Structures		4	0	0
Total		**10**	**0**	**0**
Complexity of Easement		High	Low	Low
Cost				
Total Length		4.64 Miles	2.67 Miles	2.43 Miles
Temporary Route Length		1.2 Miles	0.45 Miles	0.30 Miles
Temporary Route Cost		$1,410,085	$593,285	$395,523
Permanent Route Cost		$5,452,325	$3,520,156	$8,664,563
Total Cost		**$6,862,410**	**$4,113,441**	**$9,060,086**

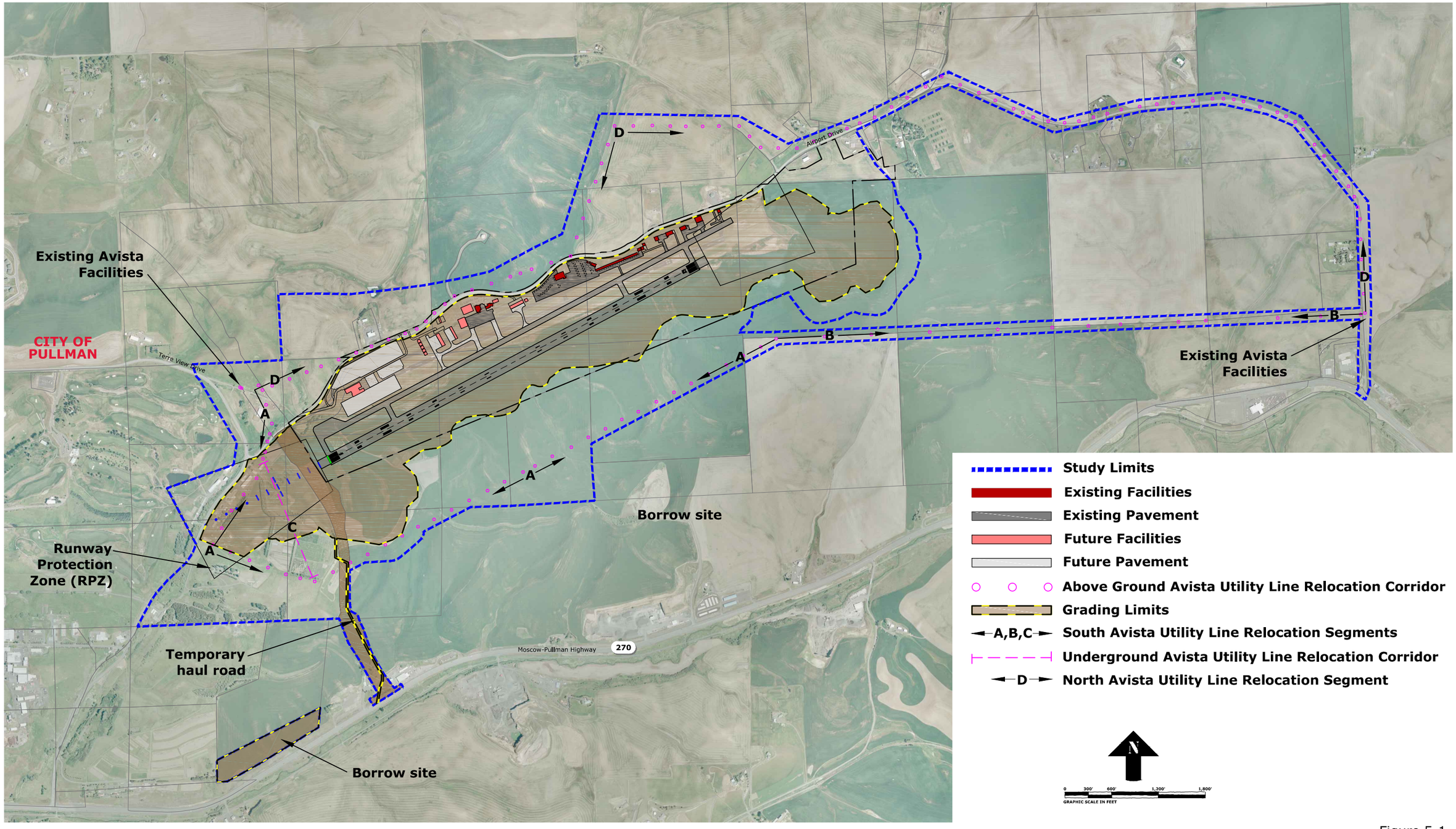


Figure 5-1

Avista Energy Corridor Relocation Options

5.1 AIR QUALITY

Whitman and Latah Counties are in attainment for all National Ambient Air Quality Standards (NAAQS) set by the U.S. Environmental Protection Agency (EPA). An attainment area is an area where pollutant levels have not exceeded the NAAQS, which are designed to protect public health and welfare. The potential air quality impacts of the No Action Alternative and Proposed Action were evaluated according to the FAA's *Air Quality Procedures for Civilian Airports & Air Force Bases*. The Clean Air Act (CAA) and NEPA are the two laws that apply to air quality for airport projects.

The CAA established NAAQS for "criteria pollutants," such as carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. The CAA requires that each state implement a plan to achieve these set air quality requirements (State Implementation Plans - SIPs). Two rules, the General Conformity Rule and the Transportation Rule, prevent the federal government from approving projects that might negatively impact the SIPs. These rules guide projects located within areas of nonattainment.

NEPA requires that the effects of the alternatives (including the No Action) be examined in relation to the current NAAQS, making sure that these limits would not be exceeded by the project in the foreseeable future. Generally, the FAA uses the number of passengers and number of general aviation operations as an indicator of potential air quality concerns. These numbers are used to help decide whether the project requires further air quality analysis. FAA's *Air Quality Procedures for Civilian Airports & Air Force Bases* explains that no air quality analysis is needed if the airport is a commercial service airport and has less than 1.3 million passengers and less than 180,000 general aviation operations forecasts annually.[2]

5.1.1 No Action Alternative

The No Action Alternative would result in no improvements to the Airport. The continued operation of the Airport with no runway or terminal improvements would not change any traffic patterns or increase the number of airport operations, or otherwise change air quality in the area.

5.1.2 Proposed Action

The Pullman area is currently within attainment for all NAAQS criteria pollutants, and therefore, General Conformity of the CAA does not apply based on the guidance of the FAA Environmental Orders. 2011 activity levels at PUW were 39,038 annual operations and 29,547 annual enplanements. The *Air Quality Procedures for Civilian Airports and Air Force Bases* states that no air quality emissions inventory is required if an airport has less than 180,000 general aviation operations and less than 1.3 million enplanements annually (FAA 1997). Through the planning horizon considered for this EA (Future Year, 2061), activity levels as forecast by the FAA are expected to be less than these thresholds; therefore, local air quality in full attainment with all NAAQS, coupled with low activity levels at Pullman-Moscow Regional Airport, do not warrant preparation of an air quality evaluation.

[2] FAA, *Air Quality Procedures for Civilian Airports & Air Force Bases*, April 1997.

The Proposed Action would slightly increase fuel emissions from a slight increase in taxi time and airport maintenance (i.e., snow removal) on the expanded runway, but this increase would be very small and not trigger a need for a detailed air quality evaluation. Therefore, the Proposed Action is not expected to cause an exceedance of the NAAQS.

The construction phase of the Proposed Action would produce a temporary increase in air pollution through the emissions of construction vehicles and dust resulting from earth moving for the runway and terminal improvements, which would be minimized through fugitive dust Best Management Practices (BMPs) (see Mitigation). Traffic patterns are not expected to change as a result of the project; therefore, vehicular traffic is not anticipated to impact air quality as a result of the project.

5.1.3 Minimization and Mitigation Measures for Air Quality Impacts

As operation of the Airport with the proposed project would not be expected to generate significant adverse air quality impacts, consideration of mitigation measures is not required or warranted. However, FAA anticipates that BMPs would be implemented to minimize air emissions during construction of the Proposed Action. Examples of BMPS that would be employed include the following:

- Minimize land disturbance.
- Use watering trucks to minimize dust.
- Cover trucks when hauling dirt or debris.
- Stabilize the surface of dirt piles and any disturbed areas.
- Use windbreaks to prevent any accidental dust pollution.
- Segregate storm water drainage from construction sites and material piles.
- Cover trucks when transferring materials.
- Minimize unnecessary vehicular and machinery activities.
- Re-vegetate any disturbed land not used.
- Remove unused material and dirt piles.
- Re-vegetate all disturbed areas if appropriate.

5.2 CLIMATE

It is well-established that greenhouse gas emissions can affect climate.[3] The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses, yet has acknowledged that "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand."[4] In January 2012, the FAA issued guidance for the consideration of greenhouse

[3] *Massachusetts v. EPA, 549 U.S. 497, 508-210, 521-23, 2007.*

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

gas emissions and climate change in FAA NEPA documents.[5] Because there are no Federal standards for aviation-related greenhouse gas emissions and how increases might affect climate change, there are no corresponding levels of local emissions increases or thresholds to establish significance.

5.2.1 No Action Alternative

The continued operation of the Airport in its current condition would not change any traffic patterns nor increase the number of airport operations. Therefore, the No Action Alternative would not result in a change to air quality or climate conditions in the area, and would not contribute to an increase GHG emissions.

5.2.2 Proposed Action

The GHG emissions at the Airport are primarily linked to fuel burn associated with aircraft operations. Because the Proposed Action would not significantly affect air quality conditions, it is anticipated that no substantial change would occur with regard to GHG emissions.

The Proposed Action would result in some minor increases in fuel burn (and therefore GHG emissions) due to slightly longer taxi times and airport maintenance associated with a longer runway (i.e., snow removal). Short-term increases in GHGs would result from the construction activities (i.e., vehicular activity in support of construction, movement of construction vehicles along haul routes, and construction worker commuting). However, these increases in fuel burn would result in relatively small and short-term increases in GHGs relative to the current conditions. According to the FAA Order 1050.1E, Change 1, Guidance Memo #3 on January 12, 2012, "For FAA NEPA reviews, GHG emissions should be quantified under the following circumstances:

1) When there is reason to quantify emissions for air quality purposes, then metric tons of C02equivalent (MT C02e) should also be quantified and reported in the NEPA documentation; or
2) When fuel burn is computed and reported in the NEPA document, quantification of MT C02e calculated from the fuel burned should also be included in the document."

This project did not qualify for either of these circumstances, therefore GHG emissions were not calculated.

Because the Proposed Action would not substantially affect air quality, and emissions resulting from construction emission would be relatively small and short-term, the Proposed Action is not anticipated to affect climate.

5.2.3 Minimization and Mitigation Measures for Climate Impacts

FAA anticipates that BMPs would be implemented to minimize air emissions and energy usage during construction of the Proposed Action (see Section 5.1, *Air Quality* and Section 5.13, *Natural Resources and Energy Supply*). When implemented, these types of BMPs could help to reduce GHG emissions at the Airport.

[5] Federal Aviation Administration (FAA) Order 1050.1E, Change 1, Guidance Memo #3, *Considering Greenhouse Gases and Climate Change Under the National Environmental Policy Act (NEPA): Interim Guidance*, January 2012.

5.3 COASTAL RESOURCES

Pullman, Washington is not located near any coastal resources; therefore neither of the alternatives affect coastal resources.

5.4 COMPATIBLE LAND USE AND ZONING

One of the main challenges facing aviation today is the encroachment of incompatible land uses near airports. Development of incompatible land uses can degrade airport operations, impede airport expansion, and reduce quality of life for airport neighbors. The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. According to the FAA, thresholds of significance are primarily related to noise impacts and the 65 DNL noise contour (i.e., 65 decibel yearly day-night average sound level). If a noise sensitive land use within the 65 DNL contour is subject to a 1.5 DNL or greater increase in noise level, the impact is considered significant.

Land use compatibility for airports also addresses issues related to navigational safety (e.g. encroaching structures and terrain), congregations of people, and hazardous wildlife. The zoning codes for both the City of Pullman and the City of Moscow include airport overlay zoning districts that provide special consideration for areas around the Airport. These techniques protect from the construction of structures that penetrate the navigable airspace, land uses that promote congregations of people, as well as those that provide habitat to wildlife hazardous to aviation.

5.4.1 No Action Alternative

The No Action Alternative would have no adverse impacts on land uses surrounding Pullman-Moscow Regional Airport. If the decision is made to keep the Airport as is, with no runway or terminal improvements, there would not be any land use changes as a result of the No Action Alternative. Currently, the 65 DNL contour at the Airport remains contained on Airport property and aircraft noise would not be expected to result in any non-compatible land uses around the Airport.

5.4.2 Proposed Action

Runway and terminal improvements associated with the Proposed Action would require the acquisition of 255.6 acres of land (see **Figure 5-2**, *Proposed Future Property Boundary*). Acquisition of land is necessary in order to protect the Airport approach area.[6] The acquisition would include two residences on the northeast side of the Airport,[7] and a number of WSU agriculture-related facilities located in the proposed RPZ. It would also include a 15.3 acre avigation easement for the Palouse Ridge Golf Course.

---

[6] According to Sec 701(b) of Order 5100.38C, *Airport Improvement Program Handbook*, protection of the airport approach includes "the approach zones (including runway protection zone), horizontal, conical, and transitional zones at airports required to convey a right of flight. This also includes the right to remove existing obstructions and to restrict the establishment of future obstructions (See Chapter 5, Section 9). As used in this paragraph, zone means land lying under the appropriate Part 77 surface."

[7] According to the zoning code, tax records, and title reports, these properties are identified as being commercial use. However, through observation of the properties, it is assumed that these structures are being used as residences.

Additionally, land acquisition would include approximately 32 acres of the SR 276 right-of-way. The right-of-way will be purchased from the Washington State Department of Transportation. The SR 276 right-of-way corridor must be maintained, therefore, WSDOT is working with the City of Pullman to designate Airport Road from SR 270 north to Terra View Drive as part of the SR 276 corridor. The FAA has approved Airport Road to be maintained within the Runway Protection Zone. The framework of the purchase of SR 276 right-of-way was negotiated between the FAA and WSDOT and correspondence is included in Appendix Q. The FAA analysis on compatible land use including roads within the RPZ is included in Appendix Q.

Runway improvements associated with the Proposed Action would shift the 65 DNL contour at the Airport to align with the new runway. To avoid land use incompatibilities, the Proposed Action would result in the acquisition of two residences. As a result of these acquisitions, no incompatible land uses would fall within this new area affected by aircraft noise levels in excess of 65 DNL and greater. Further, aircraft noise from the proposed improvements would not significantly impact any parks, schools, churches or other noise sensitive areas around the Airport.

To ensure compatibility with navigational safety, an avigation easement will be purchased for the Palouse Ridge Golf Course. The purpose of the avigation easement for the golf course is to (1) prevent construction of buildings and towers, planting of trees, installation of lighting, or any other development that might interfere with aircraft takeoff and landing, or (2) protect against liability for any nuisance caused by airplanes using the airport, i.e., the impact of noise, fumes, and vibration on the "use and enjoyment" of properties under the flight paths to and from the airport. The avigation easement for the Palouse Ridge Golf Course would not result in changes to the existing land use and is not anticipated to result in an incompatible land use.

Grading limits associated with the construction of the improvements would impact most of the WSU facilities located in the proposed RPZ. Specifically, both foreseeable south route options for the Avista Energy Corridor would encounter WSU facilities on the west side of the Airport. Therefore, these facilities would be relocated and/or removed with implementation of the proposed runway improvements in order to avoid incompatible land uses with the Airport. **Figure 5-3**, *WSU Land Use Assignments*, identifies land uses for WSU property within the proposed RPZ. Both the South Route Above Ground and the South Route Partial Underground options for the relocation of the Avista Energy Corridor would utilize part of the existing corridor for Avista facilities throughout the agricultural parcels south of the Airport. Maintaining the corridor south of the Airport would avoid impacts to existing land uses. Agricultural activities would not be disturbed by the relocation of the utility corridor.

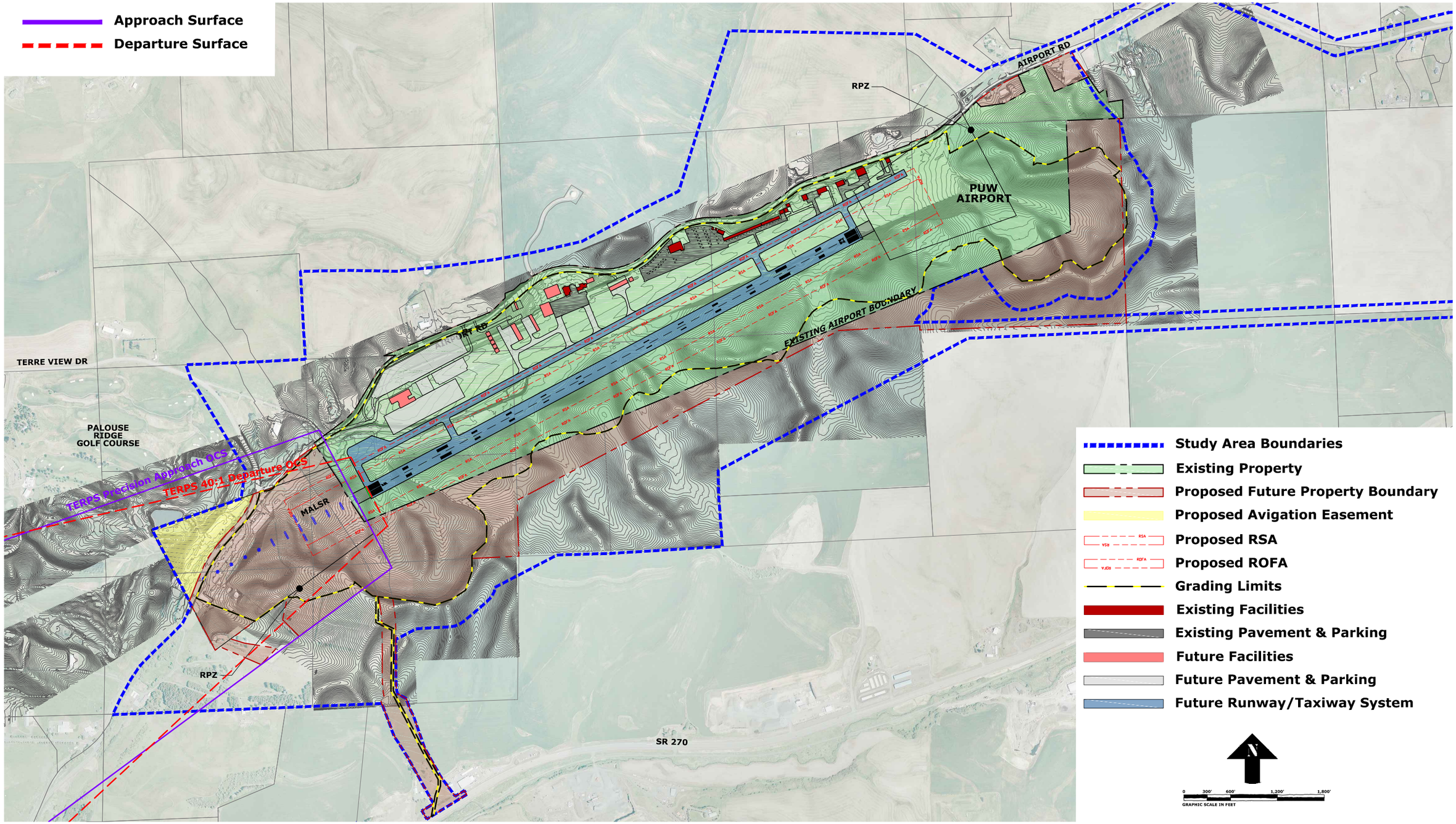


Figure 5-2
Proposed Future Property Boundary

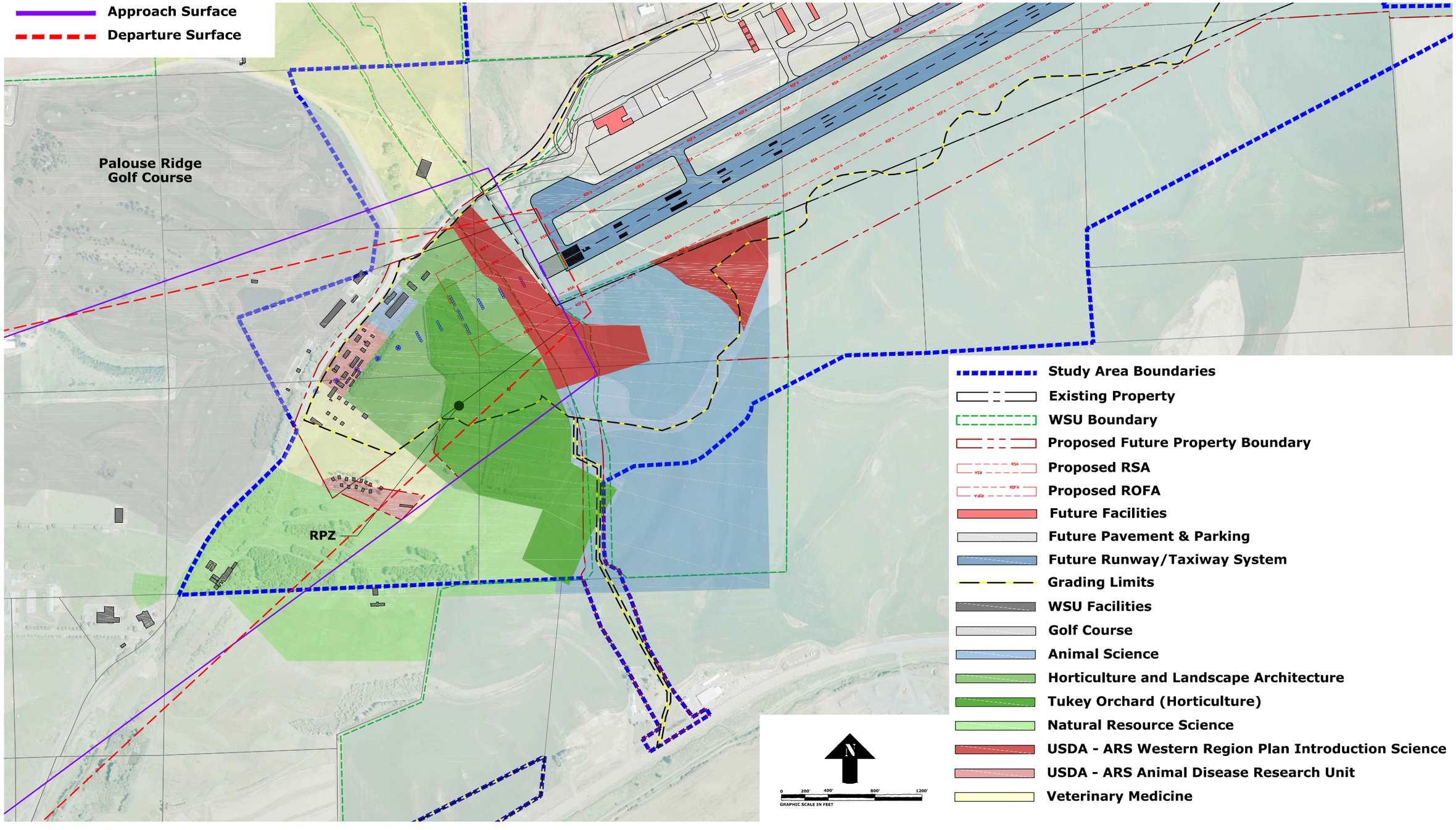


Figure 5-3
WSU Land Use Assignments

Airport land use compatibility regulations for adjacent communities are aimed at preventing site design features that attract wildlife near the airport, including open water features, wetlands, sewage ponds and fountains. To ensure that a safe environment is provided at the Airport, the Proposed Action would not involve development of open water or any wildlife attractants. Therefore, the project would not result in development that would attract wildlife.

5.4.3 Minimization and Mitigation Measures for Compatible Land Use and Zoning Impacts

Neither the No Action Alternative nor the Proposed Action would produce significant short-term or long-term land use impacts. Construction BMPs would be implemented throughout development of the Proposed Action to minimize noise and construction impacts (see **Section 5.5**, *Construction Impacts*).

The Proposed Action would result in a change of location of the 65 dB noise contour; however, the proposed changes would not result in noise-related land use incompatibility, and no residences or other noise sensitive uses would be exposed to 65 DNL or greater noise levels, individually or in combination.

The project would result in the acquisition of two residences on the northeast side of the Airport, a number of WSU agriculture-related facilities located in the proposed RPZ, a 15.3 acre avigation easement for the Palouse Ridge Golf Course, and approximately 32 acres of the SR 276 right-of-way.

For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests would comply fully with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended (Uniform Act). The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from Federal or federally assisted programs or projects. It was created to provide for and insure the fair and equitable treatment of all such persons.

5.5 CONSTRUCTION IMPACTS

Construction impacts related to a project would be temporary, but could affect different environmental resources. Construction impacts such as short-term effects on water quality, air quality, noise, and traffic congestion are possible. Construction projects also have the potential to affect surface transportation traffic near the Airport and along routes used to transport construction materials.

Construction activities are typically regulated by local, state, tribal, and federal requirements. Contractors would be required to comply with all applicable regulations, as well as FAA guidance contained in FAA AC 150/5370-10A, *Standards for Specifying Construction of Airports*, FAA AC 150/5320-15 (including Change #1) *Management of Airport Industrial Waste*, FAA AC 150/5320-5B, *Airport Drainage,* and Item P-156, *Temporary Air and Water Pollution, Soil Erosion and Siltation Control*.

5.5.1 No Action Alternative

The No Action Alternative would result in no improvements to the Airport. Continued operation of the Airport in its current conditions would not require any construction activities. Therefore, there would be no construction impacts.

5.5.2 Proposed Action

The Proposed Action includes improvements to the airside and landside facilities of the Airport. Specifically, the runway would be shifted and realigned, and a new terminal in a new location would be constructed. While final plans and provisions for the construction phases have not yet been developed, construction plans would include guidelines to help minimize impacts due to erosion, air and water pollution, sanitary waste, waste disposal and traffic alterations, caused by the construction work.

The Proposed Action involves laying new pavement, relocation of navigational aids, and construction of new facilities. These activities might temporarily increase noise and dust related to construction. Construction impacts could also include the increase of solid waste and the potential for an increase in point source pollutant emissions. The contractor would be required to dispose of all construction waste in accordance with all applicable state and federal guidelines (see **Section 5.5.3,** *Minimization and Mitigation Measures for Construction Impacts*). The construction contractor would also have to apply for a Stormwater Construction General Permit from the Washington State Department of Ecology, requiring that the crew follow BMPs to prevent stormwater pollution and erosion.

A haul road leading from SR 270 to the construction site would be used in the construction phase of the project. This route would result in temporary increases in noise and dust, but would not result in long-term impacts.

5.5.3 Minimization and Mitigation Measures for Construction Impacts

Avoidance, minimization, and BMPs have been identified to reduce construction impacts. Construction impacts would be short-term and temporary and would be discontinued after the project is completed. A number of potential impact reduction or minimization options are identified below, but the actual method of project implementation would be identified during development of final designs and as part of the permitting process. Opportunities to minimize impacts would be assessed based on the benefits of a mitigation measure relative to cost of implementation. Use of these or similar measures should ensure potential construction impacts are minimized and/or avoided to the extent practical.

- Surface routes used for transport of materials to the Airport or the movement of construction equipment would be selected to minimize noise and traffic conflicts in residential areas and other areas with sensitive receptors.
- Construction lighting would be deployed and directed in such a way as to minimize light and glare for residential areas with clear sightlines to the Airport.
- Lighting would be kept to the minimum level needed for safety and security.

- Construction lights would need to be directed away from the runway and other aircraft operation areas and may need to be shielded, if construction takes place while the Airport is open to air traffic.
- Fill materials would be obtained from local permitted sources (quarry sites along SR 270, if possible) and would be clean
- Measures to prevent dust impacts would include covering or wetting dry material, cleaning vehicles before exiting the construction site, using bump strips or grates to shake dust from the vehicles, and paving the construction site access roads.
- All construction waste would be disposed of in accordance with all applicable state and federal guidelines.
- Stormwater pollution and erosion would be prevented by implementing measures including sedimentation basins, silt traps, catch basins, and drip pans.

Below is a list of recommended permits to be reviewed during design and construction. Additional ancillary permits may be required:

- Flood Plain Revisions - LOMR (Letter of Map Revision) must be submitted to FEMA subsequent to construction completion.
- The Stormwater Pollution Prevention Plan will be updated as the project progresses.
- Section 404 Individual Permit issued by the USACE
- Section 401 Individual Permit issued by the DOE
- Hydraulic Permit Approval (HPA) issued by WDFW
- Washington State Department of Ecology (Ecology) Industrial Stormwater General Permit
- Grading Permit and Stormwater Permit (City of Pullman 2012)
- Coverage under the WDOE Construction Stormwater General Permit.
- WDOT Access Permit (for potential access from SR 270).
- Building Permit for any structure (City of Pullman)
- Right of Way Disturbance Permit (City of Pullman)
- Dewatering Permit during construction
- Potential Water Rights procurement for construction water
- Department of Natural Resources Surface Mining permit if aggregates are produced onsite.

5.6 DEPARTMENT OF TRANSPORTATION ACT: SECTION 4(F)

Section 4(f) of the Department of Transportation Act of 1966 (recodified and renumbered as section 303(c) of 49 U.S.C.) (from here on referred to as Section 4(f)) provides that the Secretary of Transportation shall not approve any program or project that requires the use of any publicly owned land from a public park, recreation area or wildlife and waterfowl refuge of National, State or Local significance or land from a historic site of National, State or Local significance, as determined by the officials having jurisdiction thereof, unless

there is no feasible and prudent alternative to the use of such land and such project includes all possible planning to minimize impact. Special procedures are also required when development would affect lands purchased or developed using the Land and Water Conservation Fund Program (LAWCON) monies. Section 6(f) of the *LAWCON Act of 1965* (Public Law 88-578), codified at Title 16 U.S. Code, Section 4601-8(f)(3), commonly referred to as Section 6(f), requires:

> No property acquired or developed with assistance under this section shall, without the approval of the Secretary [of the Interior], be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then 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 reasonably equivalent usefulness and location.

The authority to approve Section 6(f) conversions has been delegated to the Regional Directors of the National Park Service (NPS).

5.6.1 No Action Alternative

This alternative would result in no changes to the existing Airport. Therefore, no Section 4(f) resources would be affected by the No Action Alternative.

5.6.2 Proposed Action

Recreational uses in the area surrounding the Airport include a trail identified by the City of Pullman and WSU's Palouse Ridge Golf Course. The trail is identified on the City of Pullman Trail System and City Parks map; it extends along Terra View Road, Ring Road and Airport Road. The Palouse Ridge Golf Course occupies 315 acres west of the Airport and is a premier public-access facility. The course is used by WSU women's and men's Pac-10 golf teams, as well as the public.

Both the trail and the golf course are located just west of the Airport within the proposed RPZ. Neither of these resources would be located within the construction development area or within the 65 DNL noise contour. The Proposed Action would not physically disturb, take, or otherwise adversely affect these Section 4(f) properties. Further, the project would not indirectly impact these or any other Section 4(f) resources. Therefore, the project would not result in a physical or constructive use to these or any other Section 4(f) properties.

There are no cultural, historical, or archaeological sites located within the construction limits for the proposed runway or landside improvements. The FAA determined that there would be no adverse effect on historical, archeological or cultural resources as a result of the improvements associated with the runway realignment and terminal construction. Letters of coordination were sent to appropriate tribal contacts in The Department of Archaeology and Historic Preservation (DAHP). These tribes include four Federally recognized Indian tribes that have ties to Whitman County: the Coeur d'Alene Tribe; the Confederated Tribes of the Colville Reservation, Washington; the Nez Perce Tribe; and the Spokane Tribe of the Spokane

Reservation, Washington[8]. The Nez Perce tribe contacted the FAA on June 30, 2014 and stated that no revisions were necessary to the Cultural Report (**Appendix H**). The Confederated Tribes of the Colville Reservation contacted the FAA on July 11, 2014 and concurred with the finding of no adverse effect to historic resources (**Appendix H**). The Spokane Tribal Historic Preservation Office contacted the FAA on July 29, 2014 and concurred with the recommendations of a monitoring plan for all ground disturbance. The remaining tribes are reviewing the Cultural Resources Report included in **Appendix H** and their responses will be included in the Final EA.

No recreational uses exist along either of the South Route Options for the Avista Energy Corridor relocation. However, according to the Cultural Resources Report (see **Appendix H**), historic and archaeological resources were identified at a number of places along the Avista Energy Corridor relocation routes. Two archaeological sites identified as being eligible for the National Register of Historic Places (NRHP) were identified along the existing Avista Energy Corridor associated with both south route options. These two sites include an Avista Line Historic Dump and an historic drainage feature. Because these two archaeological resources are located along the portion of existing Avista Energy Corridor that would not be changed for the Proposed Action, there are no anticipated impacts to these resources. If any activities do occur in this area, avoidance of impacts to these resources located in the Avista corridor options would be ensured.

One historic site considered eligible for the NRHP was identified east of the Airport along the existing Avista Energy Corridor. The Hegedorn Barn is located east of PUW along Airport Road. The existing Avista Energy Corridor stretches north-to-south along this portion of Airport Road and is across the street from the historic barn. There are currently no impacts to the historic site as a result of the utility corridor and, because there would be no changes associated with this portion of the utility corridor, there would be no anticipated impacts to the barn. Therefore, no impacts to Section 4(f) resources are anticipated.

The Proposed Action would not result in the direct or indirect use or constructive use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from an historic site of national, state, or local significance. Therefore, no adverse effects to Section 4(f) resources are anticipated as a result of the project.

5.6.3 Minimization and Mitigation Measures for Department of Transportation Act: Section 4(f) Impacts

No Section 4(f) properties would be affected as a result of the Proposed Action. While there are no mitigation measures specifically implemented for this resource, BMPs and other mitigation efforts employed as a result of this project would help to see that no Section 4(f) resources are affected.

[8] Native American Consultation Database, U.S. Department of the Interior, accessed December 12, 2013, http://grants.cr.nps.gov/nacd/NACD_Search_Page_Query_Results.cfm

5.7 FARMLANDS

The Farmland Protection Policy Act (FPPA), a subtitle of the Agriculture and Food Act of 1981, was passed by Congress with the intent to "...minimize the extent to which Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses..." (P.L. 97-98, Sec. 1539-1549; 7 U.S.C. 4201, et seq.). Federal programs include construction projects such as highways, dams, and federal buildings, and airport developments that are sponsored or financed in part by the federal government. As defined in FPPA, "farmland" includes prime farmland, unique farmland, and land of statewide or local importance.

The proposed improvements to the Pullman-Moscow Regional Airport would qualify as "federal programs" under the FPPA. Consultation with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) is required to determine if the Farmland Protection Policy Act (FPPA) applies to any land set to be converted to non-agricultural use as a result of a proposed action.

5.7.1 No Action Alternative

This alternative would not require any disruption of land or soil and, therefore, would not impact any potential prime or unique farmland, or farmland of statewide or local importance.

5.7.2 Proposed Action

The Proposed Action would require the development of approximately 457 acres of land (grading limits). The City of Pullman indicates that the existing land use for this area is commercial, and future land use for the area surrounding the Airport (which is included in the City of Pullman's Urban Growth Area) is planned for commercial use, as well. The FPPA states that farmland does not include land already in or committed to urban development. Those soils already located on Airport property, and those soils located on property that would be acquired as part of the airside and landside improvements, are considered to be dedicated to Airport uses and are committed to urban development. Therefore, these land areas are not covered under the FPPA.

Part of the land set to be acquired under the Proposed Action is identified as prime farmland or farmland of statewide importance. Even though these lands are not covered under the FPPA, some land is used for agricultural activities, and therefore was evaluated for potential impacts. Some of these areas are located just south and west of the existing runway, where the Avista Energy Corridor could potentially be relocated. While a portion of this land is currently being used for farming, the relocation of the Avista Energy Corridor would not disrupt farming activities.

A Farmland Conversion Impact Rating Form (Form AD-1006) was completed for the Proposed Action and submitted to the USDA to confirm the findings of the analysis. The rating system on Form AD-1006 examines aspects of the land including the percent of land actively farmed, on-farm investments, distance to urban support services, number of acres to be converted and the percentage of farmland in the local government area. If the rating score is under 160, no further analysis is required. Scores ranging from 160 to 200 indicate a project may have potential impacts and scores over 200 signify a significant impact. The

completed Farmland Conversation Impact Rating Form for the Proposed Action resulted in a score of 79.6. As such, there would not be a significant impact to farmlands. A copy of the completed form is included in **Appendix N**.

5.7.3 Minimization and Mitigation Measures for Farmland Impacts

No prime farmland, unique farmland, or farmland of statewide or local importance would be affected as a result of the Proposed Action. Therefore, no mitigation is required.

5.8 WILDLIFE AND VEGETATION

The proposed improvements to the Pullman-Moscow Regional Airport were evaluated to determine if there would be any potential impacts to wildlife and vegetation near the Airport. Wildlife species commonly found in the vicinity of the Airport include birds and mammals. Most of the vegetative species that surround the Airport are non-native. The most prevalent vegetation are wheat, turf grasses, and fruit trees. Although for some resources the Federal Aviation Administration (FAA) has identified levels of impacts that, once exceeded, are considered significant, no such threshold has been established for vegetation and wildlife species that are not listed as threatened or endangered.

The Endangered Species Act (ESA) requires federal agencies to examine if proposed projects may have an adverse impact on federally listed endangered or threatened species. The agency must ensure that the project is not likely to jeopardize the continued existence of a federally listed species or significantly alter or destroy key habitat for these species.

5.8.1 No Action Alternative

This alternative would not require any disruption of land or soil and would therefore not impact any wildlife or vegetation in the area.

5.8.2 Proposed Action

A large percentage of the study area for the project is located in a pre-disturbed or pre-developed setting due to the operating airport, WSU operations, and agricultural uses. A Biological Assessment (BA) prepared in September 2013 documented the existing biological conditions and potential project effects on sensitive species in the study area (see **Appendix F**). According to the BA, there are three ESA-listed species (bull trout, Spalding's catchfly, and Ute ladies'-tresses) and one designated critical habitat (bull trout designated critical habitat) listed on the US Fish and Wildlife Service (USFWS) countywide list within Whitman County. In addition, three state-listed species of concern (Palouse goldenweed, Palous milk-vetch, and Swainson's hawk) were identified based on data from the Washington State Department of Fish and Wildlife (WDFW) and consultation with the Washington Natural Heritage Program.

Field survey results found that none of the identified species were observed within the study area. Additionally, no suitable habitat for any of the identified species except the Swainson's hawk was found within the study area. The study area may have historically been suitable habitat for Palouse goldenweed

and Palouse milk-vetch, but disturbance and conversion associated with the current and post-settlement land uses makes the presence of these species within the study area highly improbable.

The open fields within the study area represent suitable foraging grounds for the Swainson's hawk. WDFW data indicate documented Swainson's hawk activity in the study area that dates back to the summers of 1987 and 1991; however no active or relic nesting sites were observed in the study area during a 2012 Wildlife Hazard Assessment. According to the BA, the Proposed Action should not diminish foraging opportunities for the hawk in this region.

The activities associated with the Proposed Action were determined to have "no effects" on bull trout or their designated critical habitat, Spalding's catchfly, Ute ladies' –tresses, Palouse goldenweed, Palouse milk-vetch, Swainson's hawk, or their respective habitats. Therefore, no anticipated impacts to sensitive species are anticipated as a result of the Proposed Action.

The Airport property and proposed study area do not contain any high quality ecosystems. The common wildlife documented to occur in the Airport's general vicinity will likely find refuge outside of the proposed study area during construction activities and during future operations correlated to the reconstructed airfield. The Proposed Action is not anticipated to impact any of the aforementioned wildlife species populations.

5.8.3 Minimization and Mitigation Measures for Wildlife and Vegetation Impacts

No impacts to ESA-listed or state-identified wildlife or vegetation would result from the Proposed Action. Therefore, no mitigation is required. Best management practices would be implemented to stabilize barren soils and re-establish appropriate vegetation communities post construction.

5.9 FLOODPLAINS

The study area surrounding the Airport contains Federal Emergency Management Agency (FEMA) mapped 100-year flood hazard areas (Zone A) associated with Airport Creek. The Airport generally drains from northeast to southwest via primarily two drainage ways which parallel the runway. In ordinary low flow conditions, the main stem of Airport Creek flows in an open channel with a number of culvert crossings along the north side of the runway and through a section where the creek crosses the runway in a culvert near the southwest end of the Airport. Flows are conveyed downstream to another culvert beneath Airport Road, where they leave the proposed study area.

Because FEMA Zone A flood maps do not feature flood elevations or have an accompanying hydraulic model, a HEC-RAS hydraulic model was developed based on current topography and published flood flows in order to estimate existing flood storage quantities and flood conveyance velocities (see **Figure 4-5**, *Existing Floodplains*). In flood conditions, the creek exceeds its banks and overtops both upstream and downstream of Airport Road northeast of the proposed project area. The flow splits at the northeast end of the runway as water exceeds the ordinary channel. The area beyond the northeast end of the runway becomes inundated, and the flood conveyance path splits into 3 forks; the ordinary low flow channel, the local water course to the south of the runway, and a continuous infield depression. The HEC-RAS model

uses flow split coding to balance crossflow between the channels. Flood flows consolidate back to one main flow path from the main runway culvert crossing to the downstream boundary of the project area. Development actions in the floodplain must be designed to minimize adverse impact to the floodplains' natural and beneficial values.

5.9.1 No Action Alternative

With no runway or terminal improvements, no land would be disturbed nor would any land use changes adversely impact the mapped floodplains. Therefore, the No Action Alternative would have no adverse impacts on the floodplains surrounding the Airport.

5.9.2 Proposed Action

Runway and terminal improvements associated with the Proposed Action would result in land disturbing activities and land use changes. These land disturbing activities would directly impact existing floodplains by filling surface water conveyances and floodways. Using the HEC-RAS hydraulic model, changes in flows and conveyance as a result of the project (and mitigation measures discussed in the next section) were mapped to show the proposed future floodplain (see **Figure 5-4**, *FEMA Floodplain Improvements*). The Proposed Action would be designed to maintain the conveyance and storage capacity of the existing FEMA floodplain.

Impacts to designated floodplains were examined based on the thresholds of significance for floodplains, as outlined in the FAA Environmental Orders. The threshold of significance for floodplains is incorporated into FAA Order 1050.1E which states "Floodplain impacts would be significant pursuant to NEPA if it results in notable adverse impacts on natural and beneficial floodplain values. Mitigation measures for base floodplain encroachments may include committing to special flood related design criteria, elevating facilities above base flood level, locating nonconforming structures and facilities out of the floodplain, or minimizing fill placed in floodplains."

Despite the proposed floodplain modifications within the proposed study area, the existing drainage patterns downstream of the airport (i.e. within the lower section of Airport Creek and Paradise Creek) would not be changed as a result of the Proposed Action. Therefore, all floodplain related modifications would be limited to the area within the defined proposed study area. Further, mitigation measures including the re-routing of Airport Creek would reduce impacts to floodplains (see **Section 5.9.3**, *Mitigation for Floodplains*). The proposed flood conveyance improvements to the project would be refined to maintain the beneficial values of the floodplain within the study area; specifically flood conveyance, flood storage volume, and hydrologic timing. Therefore, the proposed project is not anticipated to have a notable adverse impact on

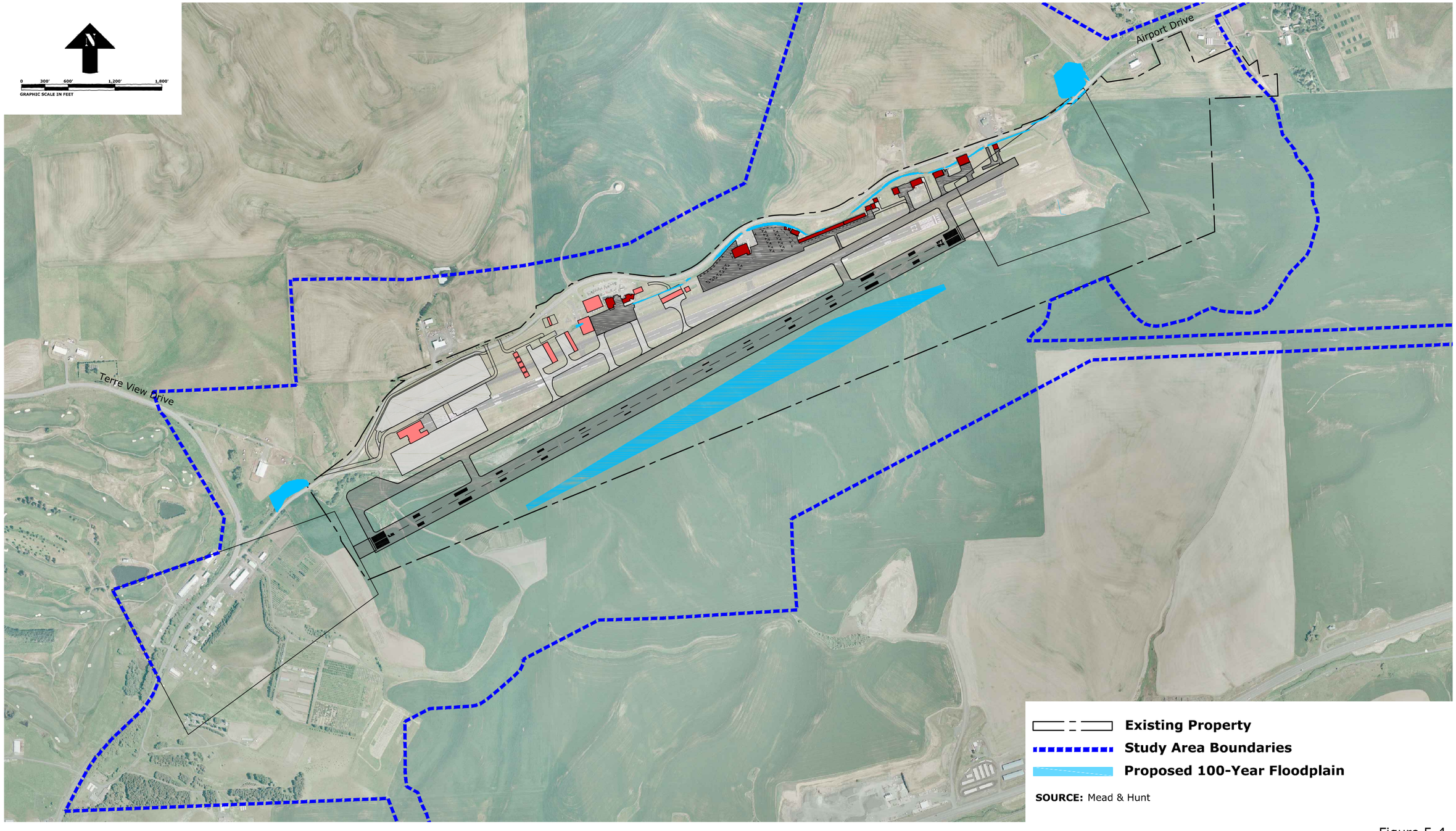


Figure 5-4
FEMA Floodplain Improvements

natural and beneficial floodplain values, and there would be no significant impacts to floodplains as a result of the project.

Coordination with the U.S. Army Corps of Engineers and the FEMA will be maintained throughout the project to avoid and minimize impacts to floodplains and to comply with the U.S. Clean Water Act.

5.9.3 Minimization and Mitigation Measures for Floodplains

To avoid adverse impacts to the floodplain, the Proposed Action would require the re-routing of Airport Creek. The upstream creek flows would be intercepted upstream to the east of the Airport, conveyed around the south side of the new runway in a system of box culverts, and reconnected to the existing Airport Creek conveyance at the crossing of Airport Road southwest of the Airport. The diversion of the upper watershed of Airport Creek around the airfield would reduce flows through the developed portions of the Airport (i.e. both landside and airside facilities) and would reduce impacts to critical infrastructure during flood events. The re-routing would provide a more predictable conveyance of flood flows. The section of Airport Creek paralleling Airport Road would be subject to reduced flows, because a large percentage of the flows would be directed southerly, around the southern end of the new runway footprint. These modifications would be designed to maintain flood storage capacity on the airport property.

Conceptually, the re-routed Airport Creek alignment would be primarily conveyed through a closed concrete box culvert with an open concrete dugway segment parallel to the proposed runway. The proposed realignment was modeled in the HEC-RAS hydraulic modeling software, building on the existing conditions model previously discussed.. The concept design attempts to replicate site hydrology such that the amount of time it takes for flood flows to travel through the site with the proposed improvements implemented, would be approximately the same travel time it takes in existing conditions. Implementation of the concept design would help to minimize the hydrologic impacts of the proposed project by spreading peak flows over a wider time frame, and potentially reducing overall intensity flow conveyed downstream during flood events. The HEC-RAS model was used to optimize both the culvert geometry and a roughened floor within the culvert in order to slow velocities within the culvert and approximate existing flood flow travel times. A section of open channel (the concrete dugway) would allow for flood storage capacity to be maintained during flooding events, commensurate with the existing or preconstruction floodplain storage volume. In flood events, a restricted inlet at the opening to the box culvert downstream of the open segment forces peak flood flows to become impounded and released at reduced intensity. The HEC-RAS model was used to optimize the restricted concrete opening, along with proposed topography which deliberately creates the impoundment depression. The combination of attempting to maintain both flow velocities and flood storage commensurate to the existing condition will minimize downstream impacts in flood events due to this development. Improvements to the remnant portion of Airport Creek (parallel to Airport Road) are proposed to reduce sediment and vegetation challenges, which arise from the conveyance of runoff from agricultural sources north and east of the Airport.

Floodplain modifications would require notifications to local and state agencies prior to any alterations of the floodplain. A Letter of Map Revision (LOMR) would be submitted to FEMA subsequent to construction completion.

5.10 HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

The identification of contaminated sites is necessary so that they can be avoided when reasonably possible, or appropriate mitigation measures can be implemented. The presence of hazardous materials is a liability concern for any potential land acquisition or proposed action, and can affect a project in terms of worker health and safety, cost, schedule, and agency and public relations, particularly if these sites are not identified prior to construction. Therefore, an assessment of site contamination in the project area is an integral part of the planning process.

In support of this environmental assessment, a Phase I Environmental Site Assessment (ESA) was performed to identify sites in the project area with the presence of potential or recognized contamination from hazardous materials (**Appendix G**). The term "hazardous materials" is an all-inclusive term for materials that are regulated as a solid waste, hazardous waste, or other wastes contaminated with hazardous substances, radioactive materials, petroleum fuels, toxic substances, and pollutants. Areas of contamination must be identified to evaluate several aspects of the proposed improvements, including responsibility and management of contaminated soil and groundwater, engineering options to minimize and mitigate impacts, activities associated with land acquisition, and worker health and safety during construction.

5.10.1 No Action Alternative

This alternative would not require any disruption of land or soil; therefore, the No Action Alternative would not generate hazardous wastes. There is no potential for the No Action Alternative to affect hazardous materials or known contaminated sites.

5.10.2 Proposed Action

The Phase I ESA identified 24 potential hazardous waste sites located within a mile of the Airport; six of these are located within 0.25 miles of the Airport. Two sites were identified on Airport property. One of the sites, a former underground storage tank (UST), has been closed and removed. The other site on airport property, a Transportation Security Administration (TSA) "small quantity generator," is expected to generate less than 100 kilograms of hazardous material per month. The generator is identified as low risk. Overall, the Phase I ESA did not identify any significant hazards at the Airport.

Solid waste generated during daily operations at the Airport would not increase as a result of the Proposed Action. There might be a temporary increase over the period of construction in the amount of solid waste due to construction related activities, but the increase would be temporary, occurring only during construction activities, and would not overextend the capacity of any landfills in the area.

Construction activities can generate hazardous wastes and some construction materials constitute hazardous substances. These materials could include fuel, oil, lubricants, paints, solvents, concrete-curing compounds, fertilizers, herbicides, and pesticides. The contractor would be required to implement proper practices to prevent or minimize the potential for these hazardous substances to be released into the environment. Chemicals, petroleum-based products, and waste materials, including solid and liquid waste, would be stored in areas specifically designed to prevent discharge into storm water runoff. Areas used for storage of toxic materials could be designed with full enclosure in mind. Construction equipment maintenance would be performed in a designated area and control measures, such as drip pans to contain petroleum products, would be used. All spills would be cleaned up immediately and disposed of properly.

The Airport has a Stormwater Pollution Prevention Plan (SWPPP) to regulate the discharge of stormwater that might contain traces of harmful pollutants. The construction team would use Best Management Practices to prevent stormwater pollution or erosion during the construction phase. Should any contaminated sites be discovered during construction, or should a spill occur, work would stop immediately and the contractor would notify the National Response Center (NRC).

5.10.3 Minimization and Mitigation Measures for Hazardous Materials

The Proposed Action would not generate hazardous material, nor would it affect existing potentially hazardous resources. Therefore, no mitigation is required.

5.11 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

The National Historic Preservation Act of 1966 (NHPA) requires a review to determine if any properties within the environmental impact area of a proposed action are listed in or are eligible for inclusion in the National Register of Historic Places (NRHP). The Archeological and Historic Preservation Act of 1974 provides for the preservation of historic American sites, buildings, objects, and antiquities of national significance by providing for the survey, recovery and preservation of historical and archeological data. Section 106 of the NHPA requires Federal agencies to consider the impact of their undertaking on properties on or eligible for inclusion in the NRHP. Compliance with Section 106 requires consultation with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer (SHPO), and/or the Tribal Historic Preservation Officer (THPO) if there is a potential adverse effect to historic properties on or eligible for listing on the NRHP.

A Cultural Resources Report was conducted in May 2014 to determine if cultural resources in the built environment were present within the Area of Potential Effect (APE). The resources were evaluated to determine if they qualify for inclusion in the National Register, and if so, if the Proposed Action would have any adverse effects to these resources. This study provided the basis for the FAA government-to-government consultation as prescribed in E.O. 13175, *Consultation and Coordination with Indian Tribal Governments* initiated in June 2014 with the Nez Perce THPO, Coeur D'Alene Tribe of the Coeur D'Alene

Reservation, Confederated Tribes of the Colville Reservation, and the Spokane Tribe of the Spokane Reservation, as well as for Section 106 with the tribes and the Washington DAHP (see Appendix H).

Four cultural resources in the Area of Potential Effect (APE) were identified as being eligible for listing in the NRHP. Of ten archaeological resources identified within the APE, two archaeological sites, both located along the existing Avista Energy Corridor line south of the Airport, were identified as being eligible for the NRHP: the Avista Line Historic Dump and an Historic Drainage Feature. Of twenty-two historic resources located within the APE, two were identified as being eligible for the NRHP. One historic site, the F.W. Hegedorn Barn, is located along the existing Avista Energy Corridor on the east side of the Airport along Airport Road. The other historic site, the Pullman Plant Material Center, was identified alongside a borrow site (see **Figure 5-5**, *APE and Historical Resources*). The Cultural Resources Report is included in **Appendix H**.

A cultural survey and determination were also conducted for a wetlands mitigation site (see **Section 5.18**, *Wetlands and Waters of the US,* for a description of the wetland mitigation site). No cultural resources that were eligible for the NRHP were identified in the area. . See **Appendix H** for the Cultural Resources Survey and Evaluation for the Kammerzell Wetland Mitigation Site. The FAA will initiate consultation with the tribes and SHPO pursuant to Section 106 of the NHPA and E.O. 13175, *Consultation and Coordination with Indian Tribal Governments*.

5.11.1 No Action Alternative

The No Action Alternative would not result in any development activities. Therefore, there would not be any impacts relative to historical, archaeological, or cultural sites.

5.11.2 Proposed Action

The cultural survey identified two archaeological sites (the Avista Line Historic Dump and an Historic Drainage Feature) and two historic properties (the F.W. Hegedorn Barn and the Pullman Plant Material Center) that were recommended as eligible for listing in the National Register. All of these resources are located within the APE.

Both archaeological sites are located along the portion of the Avista Energy Corridor alignment south of the Airport that would not be affected by the Proposed Action. Because this existing portion of the utility corridor would not be changed as part of the energy corridor relocation, the Proposed Action would not result in an adverse effect to these archaeological resources.

Proposed project activities associated with the potential borrow site adjacent to the Pullman Plant Material Center would not result in any direct effects to the historic resource. Further, there would not be any indirect visual changes that would diminish the characteristics of the property qualifying it for listing in the National Register. Proposed project activities would not result in any direct or indirect effects to the F.W. Hegedorn Barn and would not diminish characteristics of the property that qualify it for listing in the National Register.

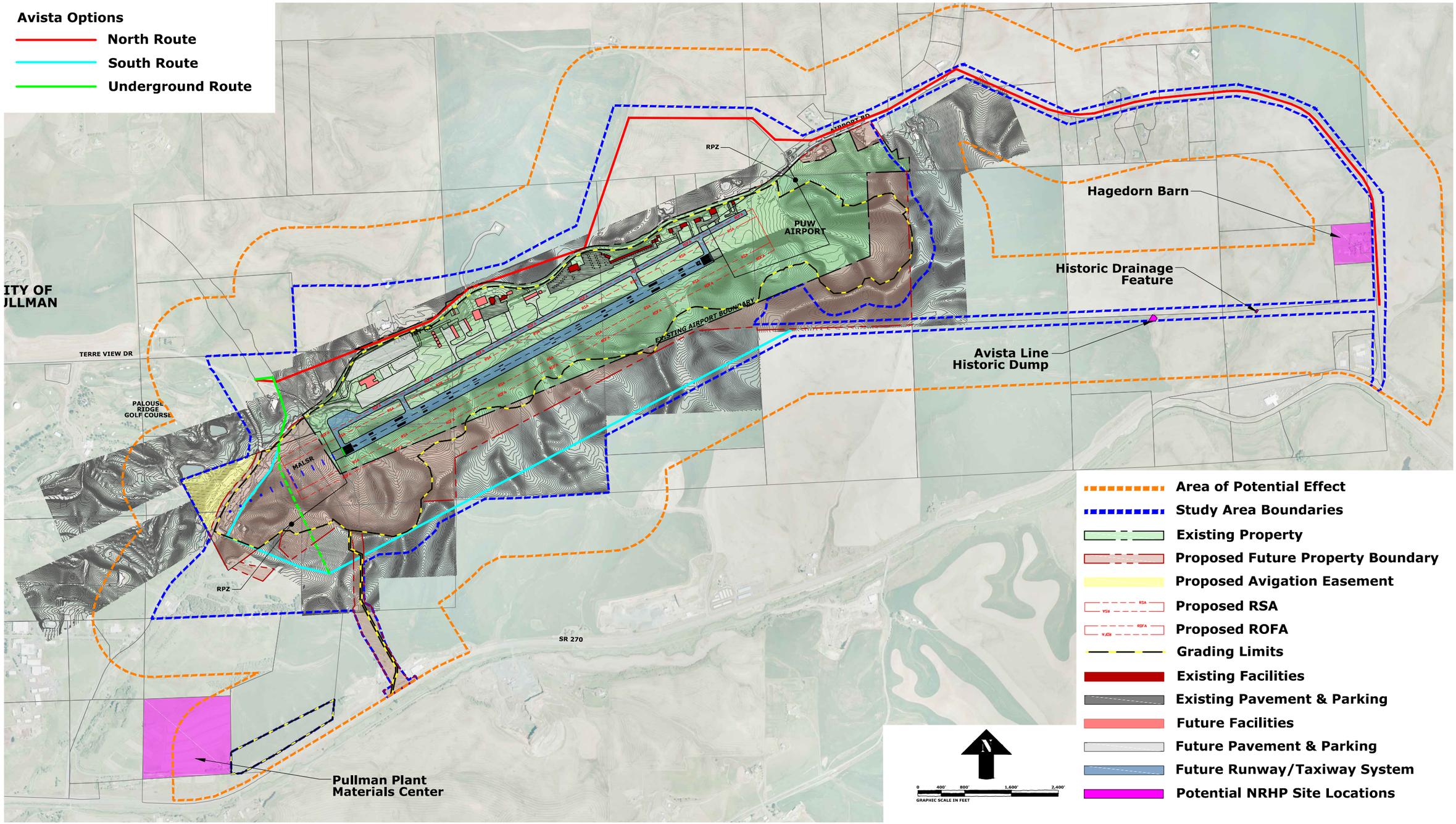


Figure 5-5
APE & Historical Resources

Therefore, the Proposed Action is not anticipated to result in any adverse effects to cultural resources. See **Appendix H** for the Cultural Resources Survey and Evaluation for the Kammerzell Wetland Mitigation Site.

5.11.3 Minimization and Mitigation Measures for Historic, Architectural, Archaeological, and Cultural Resources

Because the Proposed Action would not result in any adverse effects to cultural resources, there would be no mitigation.

5.12 LIGHT EMISSIONS AND VISUAL ENVIRONMENT

The Airport is located in the heart of the Palouse Region in the foothills of the Clearwater Mountains. The topography for this region is characterized by rolling silt and sand, steep rock, and channeled scablands.[9] PUW is entirely surrounded by 100 to 200-foot-tall hills. A significant portion of the vicinity and region is similarly comprised of hilly, rolling terrain with minimal flatland areas.

According to FAA Order 1050.1E, Appendix A, Section 12.2a, light emissions are considered to have an environmental impact, "when an action's light emissions create annoyance to interfere with normal activities." Normal activities could include sleeping, driving, or other light sensitive activities. FAA Order 1050.1E states that "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." Changes in light emissions were analyzed by comparing the existing lighting environment at the Airport with the proposed lighting environment for each alternative, and with nearby land uses, where the use of the land may conflict with lighting exposure.

In addition to the evaluation of light emissions, a visual impact assessment was conducted. The visual assessment process included determining effects to visual resources by improvements that would:

- Block or impede views of scenic value (such as mountains or pastoral landscapes)
- Change the existing visual character or quality of the site, such as:
    - Introducing new visual elements,
    - Impacting town character, and/or
    - Impacting wetland resources, floodplains, and unique landforms.

Visual impacts are subjective because they include personal aesthetic preferences and perceptions. These impacts deal more broadly with the extent to which development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable.[10] Because visual impacts are very difficult to quantify and the FAA has not defined a threshold of significance for light emissions, professional judgment was used to determine relative impacts.

[9] Scablands are a barren, relatively soil-free landscape, scoured clean by a flood unleashed when a large glacial lake drained. They are a geologically unique erosional feature in the state of Washington.

[10] FAA Order 1050.1E, Appendix A, Section 12.2b.

5.12.1 No Action Alternative

The No Action Alternative would not result in any changes to the existing lighting at the Airport or the visual character of the area. Therefore, the No Action Alternative would not result in any impacts to visual resources.

5.12.2 Proposed Action

The existing airfield lighting system at PUW would be replaced with runway and taxiway edge lighting, full center line lighting, MALSR (Medium Intensity Approach Lighting System With Runway Alignment Indicator Lights), and touchdown zone lighting. These proposed lighting improvements would provide more light at a greater intensity to guide pilots toward the runway. The proposed extension of the runway would require additional lights to line the fully extended runway. Homes and businesses nearest the Airport are located along Airport Road. Most of these properties have views of the rolling topography. Some of these properties may have views of Airport facilities (i.e., the terminal or hangars), but do not have direct views of the runway. Because these properties cannot directly see the runway, these properties would not incur adverse effects due to changes in lighting (including center line lighting, MALSR, or touchdown zone lighting) along the runway at the Airport. Further, FAA has used light-shielding techniques on similar projects to minimize visual effects resulting from approach lighting systems.

Visual, or aesthetic, effects are inherently more difficult to define and assess because they involve subjectivity. Visual effects deal broadly with the extent to which airport development contrasts with the existing environment, architecture, historic or cultural setting, or land use planning. No Federal regulations govern light emissions or visual intrusions. However, FAA considers potential effects to properties, and people's use of properties, covered by Section 4(f) of the U.S. Department of Transportation (DOT) Act, Section 6(f) of the Land and Water Conservation Fund Act (LWCF), and Section 106 of the National Historic Preservation Act (NHPA).

5.12.3 Minimization and Mitigation Measures for Lighting Emissions and Visual Impacts

Because the Proposed Action would not result in any adverse effects to visual resources, there would be no mitigation.

5.13 NATURAL RESOURCES AND ENERGY SUPPLY

FAA Order 1050.1E, Appendix A, Section 13.2b states: "For most actions, changes in energy demands or other natural resource consumption would 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."

Energy requirements associated with airport improvements generally fall into two categories: 1) changed demand for stationary facilities (e.g. airfield lighting and terminal building heating) and 2) those that involve the movement of air and ground vehicles, altering fuel consumption. To analyze potential impacts on natural

resources and energy supply, the use of fuels, electricity, and water associated with constructing and operating the improvements were examined to determine if there would be a potential impact on fuel supply or if the project would greatly increase energy or water use related to existing supplies/capacity.

5.13.1 No Action Alternative

The No Action Alternative would not change energy or natural resource use at the Airport. Therefore, there would be no significant impacts to any natural resources or the energy supply as a result of the No Action Alternative.

5.13.2 Proposed Action

During the implementation of the Proposed Action, the use of natural resources would principally include construction materials and water. Materials would most likely come from local quarries along SR 270 and local asphalt plants within the county. Transport of material associated with implementation would likely include haul trucks and would increase fossil fuel consumption during construction. However, based on best professional judgment, this increase would be short-term, temporary, and small relative to the overall amount of resources available; therefore, use of fuel to transport fill material would not exceed the capacity of the existing or future availability of fuel in the area.

No known natural gas, geothermal, or other energy resources would be affected as a result of the Proposed Action. Conversion of the existing approach capabilities to a Category I ILS would require approximately three additional navigational aids, which could result in a minor increase in energy usage. The navigational aids and runway lights are critical systems that need to run electrically and are powered by the local electric grid as well as a backup generator. The system requirements allow little room for implementing different, more sustainable power sources for these important safety features. Optional items that are being considered as part of the Proposed Action include in-pavement touchdown zone lights and additional equipment to measure the localized visibility near ground level. These additions would also require more energy, but not a substantial amount. The Proposed Action would not use any resources that are in short supply.

The Proposed Action would lead to a minor increase in fuel consumption due to the extension of the runway from 6,700 feet to 7,100 feet. However, this increase in taxiing distance would not significantly impact use of fuel, nor would it affect National Ambient Air Quality Standards in the area.

Relocation of the Avista Energy Corridor would re-route the utility line, but would not affect usage of electricity. Impacts to energy and natural resources associated with the relocation of the Avista Energy Corridor would be similar to those impacts incurred by implementation of the landside and airside improvements. Transport of material associated with the relocation of the utility corridor would likely include haul trucks and would increase fossil fuel consumption during construction. However, neither of the south route Avista Energy Corridor Relocation options are expected to substantially change natural resource or energy use.

The Proposed Action would not significantly increase the use of natural resources or energy in the area. Further, materials would be locally sourced (within the county). Therefore, the Proposed Action is not anticipated to result in significant impacts to natural resource or energy supplies.

5.13.3 Minimization and Mitigation Measures for Natural Resources and Energy Supply

Because there would be no significant impacts to natural resources or the energy supply, no mitigation measures would be implemented.

5.14 NOISE

Aircraft noise is the primary driver of airport land use compatibility conflicts. The noise metric used for environmental analysis is the day-night average sound level (DNL), a metric that provides a measure of the total sound energy from aircraft operations during a specified time period. The DNL is a weighted average of sound levels at a location over a 24-hour period. It also includes a 10-decibel (dB) penalty for all aircraft operations occurring during nighttime hours between 10:00 p.m. and 6:59 a.m. This penalty acknowledges that noise during typical sleeping hours is more disruptive or intrusive than noise occurring during the rest of the day; in part because ambient sound levels during nighttime hours are typically about 10 dB lower than during daytime hours.

The FAA has adopted guidelines for evaluating the compatibility of various land uses with various noise levels resulting from aircraft (FAA Order 1050.1E). These land use compatibility guidelines note that some land uses, including residences, are compatible with noise levels below 65 DNL, while only certain uses are compatible with noise levels at or above 65 DNL. The guidelines reflect the average response of large groups of people to noise, and therefore might not reflect an individual's perception of an actual noise environment.

The FAA's Integrated Noise Model (INM), Version 7.0c is a computer program used to identify the location and level of aircraft noise on and around an airport. The INM produces noise exposure contours, which are displayed as lines connecting points of equal noise levels resulting from aircraft operations. Noise contours are similar to the contour lines on a topographic map that connect locations of equal elevation. A baseline analysis using aircraft data was prepared to illustrate existing noise conditions from aircraft operations. The 65 DNL was analyzed to determine if significant impacts would occur. The 60 and 70 DNL contours are also provided for information purposes. **Appendix L** includes information on the scenarios used to generate predicted noise contours, and factors such as airport characteristics, flight procedures, and aircraft operations that influence noise levels.

The threshold of significance for aircraft noise is defined in FAA Order 1050.1E, Appendix A, Paragraph 14.3, as follows: "A significant noise 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 dB or more at or above DNL 65 dB noise exposure when compared to the No Action Alternative for the same timeframe. For example, an increase from 63.5 dB to 65 dB is considered a significant impact." Each alternative was evaluated for potential noise impacts.

5.14.1 No Action Alternative

Existing noise contours for the Airport were developed using aircraft operations data discussed in Chapter 2, *Purpose and Need*. The existing noise contours are presented in **Figure 4-7**, *Existing Noise Contours.* This figure shows the existing 60, 65, and 70 DNL noise contours. The existing 65 DNL noise contour for the 6,700 foot runway covers an area of 81 acres and is forecast to cover an area of 89 acres by 2018, and 94 acres by 2023. No noise sensitive land uses would be affected by this noise contour, now or in the future. Therefore, no significant noise-related impacts are anticipated as a result of the No Action Alternative.

5.14.2 Proposed Action

Runway improvements associated with the Proposed Action, including approach and departure procedures, would shift the 65 DNL contour to align with the new runway (see **Figure 5-6**, *Noise Contours for Proposed Action*). With the extended 7,100 foot runway, the 65 DNL noise contour is expected to cover 93 acres by 2018, and 98 acres by 2023.

No housing units or incompatible land uses would fall within this new area affected by aircraft noise levels in excess of 65 DNL and greater. Changes in noise exposure resulting from the Proposed Action would not expand the area within the 65 DNL noise contour to include any noise sensitive land uses in the future, including residential uses, nor would they result a 1.5 DNL increase within this contour. Aircraft noise from the proposed improvements would not significantly impact any parks, schools, churches or other noise sensitive areas near the Airport. Therefore, the Proposed Action is not expected to result in significant noise effects.

5.14.3 Minimization and Mitigation Measures for Noise

Because there would be no significant impacts to noise as a result of the Proposed Action, no mitigation measures would be implemented.

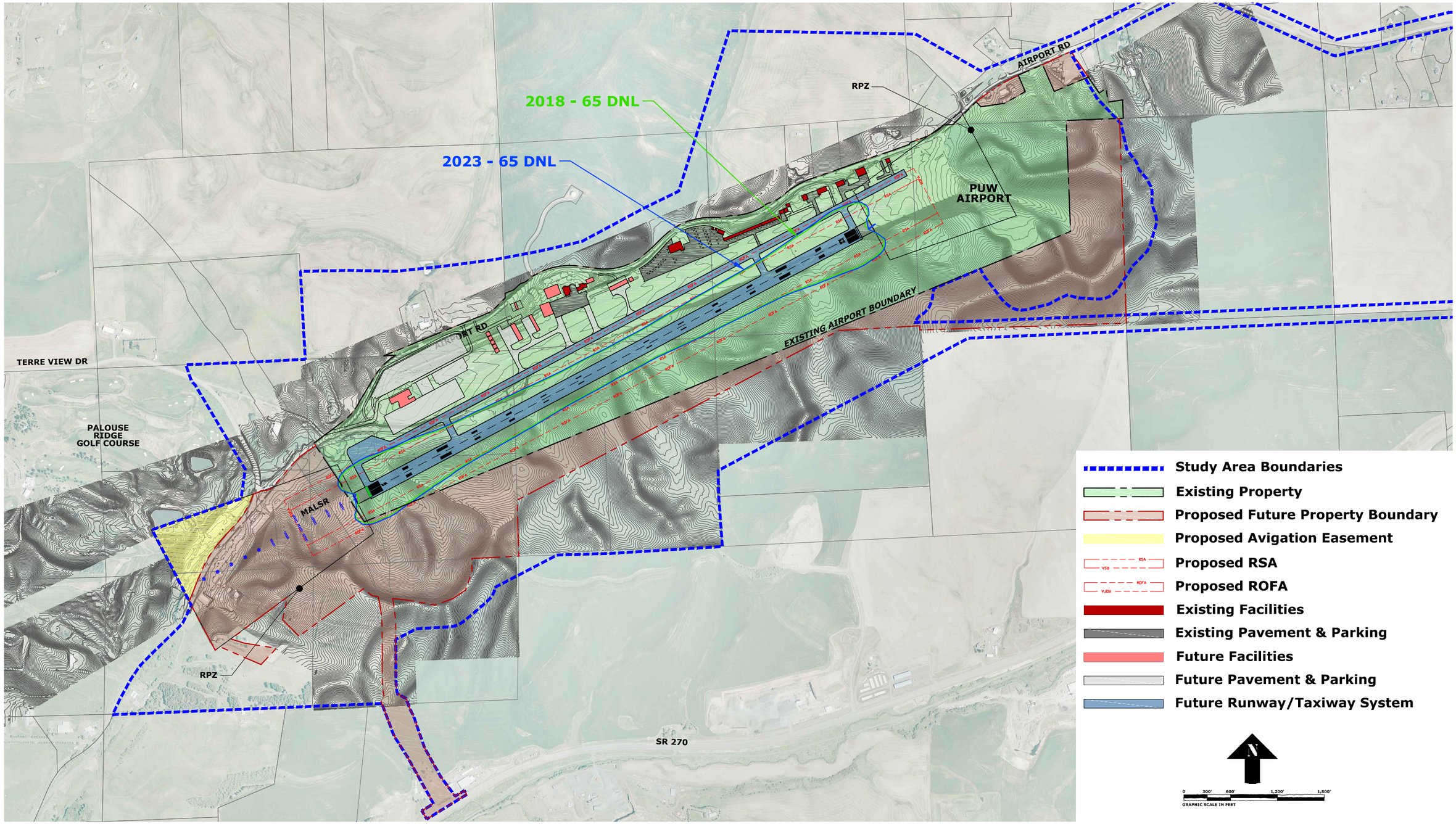


Figure 5-6
Noise Contours for Proposed Action

5.15 SECONDARY (INDUCED) IMPACTS

Major development projects could potentially influence induced or secondary impacts on the surrounding community. Some of these induced impacts could include the relocation of people or a substantial change to traffic patterns in the area. FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, Appendix A, Section 15, states that examples of induced or secondary impacts include "shifts in patterns of population movement and growth; public service demands; and changes in business and economic activity to the extent influenced by the airport development." That same section also notes that such impacts "will normally not be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts."

5.15.1 No Action Alternative

The No Action Alternative would not result in any changes to the Airport or surrounding areas. Therefore, no significant secondary or induced impacts are anticipated as a result of this alternative.

5.15.2 Proposed Action

As discussed in **Chapter** 3, *Alternatives*, the Proposed Action would accommodate for existing and forecasted demand at PUW. However, it is important to note that while the project would accommodate for demand, the project would not affect demand or cause changes in demand. It is assumed that the aviation activity forecast would be the same with or without the project. Therefore, any changes to population growth, economic activity, or traffic patterns would not be a result of the Proposed Action.

Aviation activity is not the driver for population increases or changes to physical or economic development in the area; existing and future automobile traffic would be present whether or not the Proposed Action is implemented. Consequently, it is not anticipated that the Proposed Action would result in secondary impacts such as shifts in patterns of population movement, changes in business and economic activity, changes in traffic patterns, or changes to public service demands (i.e., fire and police protection, educational opportunities, or utility services).

Short-term beneficial economic impacts are expected from a temporary increase in employment due to construction work for the Proposed Action. This employment would have a positive impact on the local economy. While the relocation of two residences would be necessary as part of the project, the Proposed Action would not have a significant impact on the social or economic environment. Further, the project would have no impact on the local tax base. Because the project would not affect demand, and there would be no significant impacts to noise, land use or socioeconomic conditions, there are no significant secondary or induced impacts expected as a result of the Proposed Action.

5.15.3 Minimization and Mitigation Measures for Secondary Impacts

The Proposed Action would not result in secondary impacts. Therefore, no mitigation measures would be implemented.

5.16 SOCIOECONOMIC ENVIRONMENT, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Socioeconomic impacts are most often generated as an indirect effect of an action. For example, factors like employment or quality of life can be affected as a result of a project. While these impacts are difficult to identify with any degree of accuracy, it is important that they are evaluated as part of the planning process.

Socioeconomic impacts can also occur as a result of a direct impact. For example, the acquisition of property could result in a change to a social or economic climate. Or impacts to a school or local facility could affect the social or economic environment.

The Environmental Justice evaluation helps to determine whether an action results in an inequitable distribution of negative effects to minority and low-income population groups. Environmental Justice is examined during the evaluation of other impact categories, such as noise, air quality, water, hazardous materials and cultural resources.

Agencies are encouraged to identify potential impacts to ensure that their policies, programs, activities and standards address disproportionate risks to children resulting from environmental health risks or safety risks. Impacts on schools and homes with children are examined in terms of noise impacts and other general environmental health and safety issues.

Local populations are protected from potential impacts on socioeconomic conditions under regulations included in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*.

5.16.1 No Action Alternative

There would not be any significant changes to the socioeconomic environment around the Airport as a result of the No Action Alternative. No minority or low-income populations would be adversely or disproportionately affected by the project, through noise impacts or other means. Further, no groups of children would be adversely affected by the No Action Alternative.

5.16.2 Proposed Action

The Proposed Action would induce temporary positive socioeconomic impacts within the region as a result of construction activity necessary for the implementation of improvements. These impacts would result in a positive impact to the economy during construction by increasing employment opportunities and expenditures on local services and materials. However, the economic effect would not be great enough to result in local tax base implications.

The project would have no effect on population growth or local development. Additionally, local traffic patterns would remain the same, as aviation activity and the Proposed Action would not impact them. The social environment in and around the Airport would not be affected by the project.

Two residences would be acquired as a result of the project. According to the zoning code, tax records and title reports, these properties are identified as commercial. However, it was observed that people are living at both properties. Residents in both properties would have to be relocated as part of the project. According to the housing statistics from the 2010-2012 *American Community Survey*, the City of Pullman has almost 1,400 housing units that are currently vacant and available as residences. Therefore, there is not a housing shortage that would require concern over finding suitable housing for relocation. Further the relocation of these residents would not affect the local tax base nor social environment.

US Census data show that PUW is located in a Census tract that is 67.8% minority and 30.2% below poverty. The project would not have a negative impact on local communities resulting from aircraft noise, degraded water quality, effects to cultural or community cohesion, or effects to traffic. Therefore, the Proposed Action is not expected to result in any adverse or disproportionate impacts to any specific population groups, including minorities and low-income communities, as well as non-minority or non-low-income communities. Therefore, the Proposed Action would not result in environmental justice impacts.

The Proposed Action would not result in any environmental health risks or safety risks for children. There are no schools, parks or playgrounds within the area that are located within the 65 DNL or greater noise contour that might be affected by noise or other impacts. Students (and staff) at Washington State University and the University of Idaho, Moscow would benefit from the Proposed Action because of the resulting increased safety and efficiency at the Airport.

5.16.3 Minimization and Mitigation Measures for Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety

Because there would be no substantial impacts to the socioeconomic climate, to environmental justice populations, or to the environmental health and safety of children within the study area, there would be no mitigation measures implemented.

Two residences would be relocated as a result of the project. For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests would comply fully with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended (Uniform Act). The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from Federal or federally assisted programs or projects. It was created to provide for and insure the fair and equitable treatment of all such persons.

5.17 WATER QUALITY

Water quality considerations related to airport development include erosion from construction activities, increased surface runoff due to increased impervious areas, and pollution potential from industrial activities such as aircraft fueling and deicing. Land-disturbing activities can directly impact water quality by altering hydrologic and hydraulic conditions, stormwater runoff characteristics, and groundwater resources. Adjacent water wells could potentially be affected by the Proposed Action. Potential pollution from airfield development could come from petroleum products spilled on the surface and deicing fluids collected on pavements carried through drainage channels off of the Airport.

Airport Creek, part of South Fork Palouse River Watershed, flows from the northeast to the southwest through the study area, and ultimately drains into Paradise Creek near the intersection of Airport Road and SR 270. Airport drainage is a combination of surface and underground conveyances discharging to Airport Creek. The drainage infrastructure is subject to various federal, state, and local regulations intended to protect receiving waters from water quality impairment due to development actions.

5.17.1 No Action Alternative

The No Action Alternative would not involve construction activities or increases to impervious surface area that could result in increased stormwater runoff. Stormwater discharge rates, groundwater recharge, and maintenance practices at the Airport would remain unchanged from existing conditions. Therefore, the No Action Alternative would have no adverse impacts on water quality surrounding the Airport.

5.17.2 Proposed Action The Proposed Action would result in a modification to site drainage patterns, an increase of approximately 60 acres of impervious area, and additional industrial activities. The new airfield alignment and grading would interrupt the current drainage associated with Airport Creek, most notably the floodplain function, as previously discussed in **Section 5.6**, *Floodplains*. Various alternatives were evaluated for the re-routing of the creek and the preferred alignment of the creek. The new alignment of Airport Creek would intercept it upstream, to the northeast of the Airport, and would divert the flow to the south and parallel to the proposed runway. Airport Creek would then connect with the original alignment at the southwest end of the Airport where Airport Creek crosses Airport Road as shown in **Figure 5-7**, *Proposed Drainage Layout Plan*. This alignment would reduce runway and taxiway crossings beneath pavement, would accommodate future landside development, and would allow for construction of the future airside improvements. The remnant portion of Airport Creek (parallel to Airport Road) would remain. The underground pipe which crosses the airfield would be extended along the same alignment and connect to the new Airport Creek alignment.

Drainage for the new airfield improvements would be collected in a localized drainage network separate from the Airport Creek drainage. The drainage network would drain to the north and west towards the new terminal area. The combined drainage from the new airfield and terminal area would discharge to Airport Creek near the crossing of Airport Road at the southwest end of the Airport as shown in **Figure 5-7**, *Proposed Drainage Layout Plan*.

Drainage conveyance systems must be designed to create an efficient stormwater network in order to maintain airfield safety and include flow control to reduce peak flow rates from increased impervious areas. To minimize downstream water quality impacts, flow control and treatment BMPs are required for smaller, more frequent storms. The water quality flow control requires more frequent storm events to be reduced to half of the pre-development flow rates. Water quality treatment BMPs are to provide further treatment of even smaller, more frequent storm events and target potential pollutants of concern associated with the industrial activities of the airport development.

All industrial activities on the Airport are subject to the conditions of Ecology's ISGP. The proposed improvements would require additional BMPs and updates to the Airport's SWPPP and ISGP.

Land disturbance and increases in impervious area could directly impact water quality by altering hydrologic and hydraulic conditions, stormwater runoff characteristics, and groundwater resources. A sensitivity assessment was used to identify potential impacts to water wells and surface water diversions associated with adjudicated water rights in the study area (see **Figure 4-10**, *Water Wells*). The sensitivity of each water source was addressed by categorizing each of them into a relative level of risk based on several parameters, including: proximity of the water source to the planned construction activities, depth of wells, surface elevation relative to the construction, type and condition of the well/diversion, and soil or rock characteristics of the aquifer matrix and ground surface. The Water Resource Exhibits (**Appendix K**, Exhibit A) and **Figure 4-10**, *Water Wells* illustrate the locations of the water wells, surface water diversions, and other types of water related infrastructure. In concert with the aforementioned exhibits, the Well Inventory Matrix and the Certificate/Claim Inventory Matrix **Appendix K**, Appendix B summarize the anticipated sensitivity of the known wells (14 total; please note, locations for 2 wells are currently unknown) and irrigation claims/certificates (4 total; 1 is undocumented) that exist within the project limits (1,349 acres).

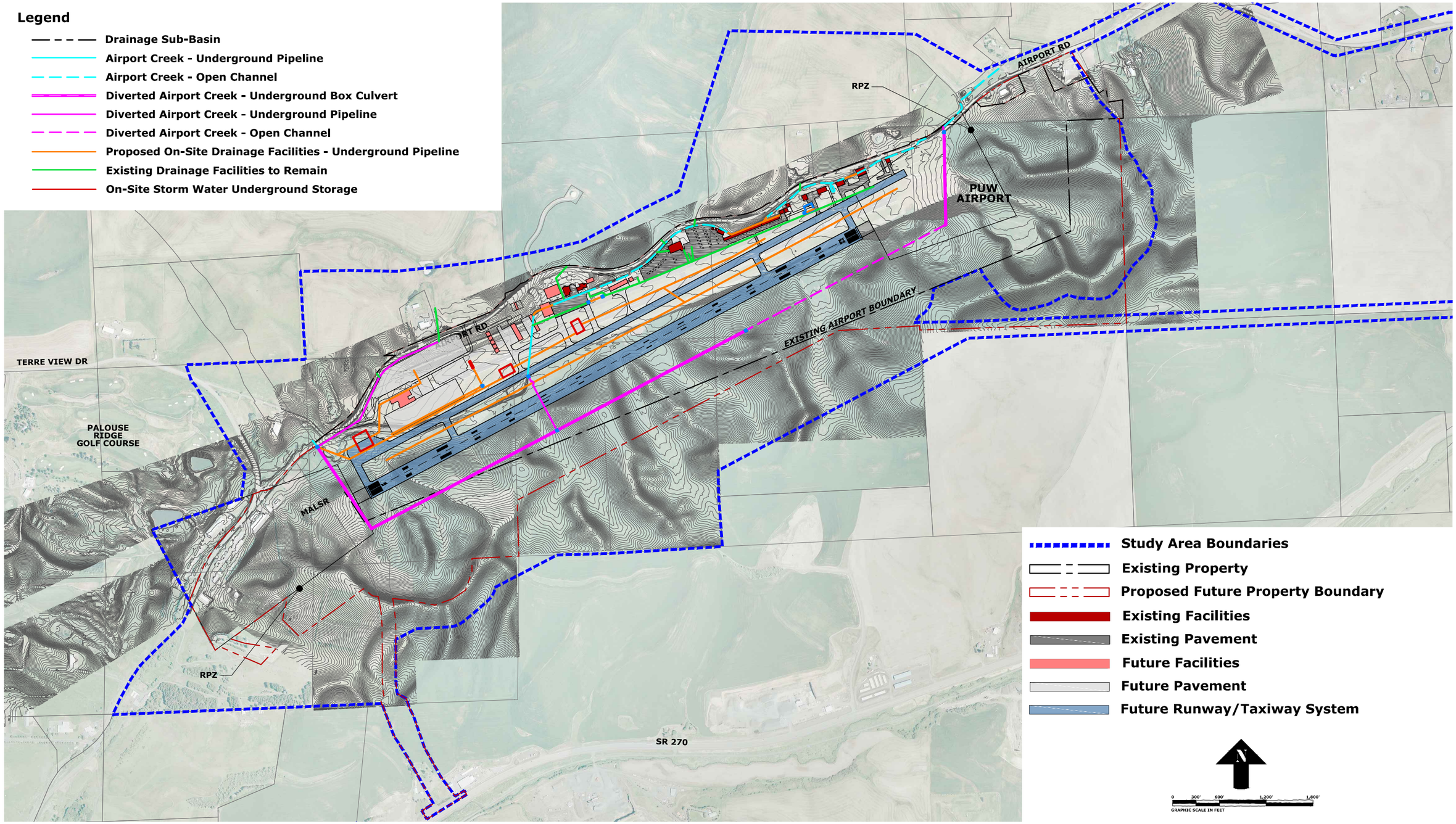


Figure 5-7
Proposed Drainage Layout Plan

Construction activities associated with the proposed improvements would result in temporary increases in erosion and sedimentation. Contractors would be required to follow guidelines outlined by the FAA's Advisory Circular 150/5370-10A, Standards for Specifying Construction of Airports, which includes guidance for airport sponsors to help protect the environment during the construction phase and minimize impacts due to erosion, pollution, sanitary waste, and chemical use. The construction would also require an Erosion and Sediment Control Plan, Grading Permit and Stormwater Permit from the City and coverage under the Ecology's Construction Stormwater General Permit.

Impacts to water quality associated with the relocation of the Avista Energy Corridor would be limited to the land-disturbing activities associated with construction. The completed construction would not have a notable increase in impervious area and there would be no industrial activities with pollutant potential. The ground cover would change due to removal of large vegetation along the corridor but would have a nominal impact on the hydrologic and hydraulic conditions, stormwater runoff characteristics, and groundwater resources.

Typically, if an action results in an exceedance of a water quality standard or permit condition, that action would be considered to cause significant impacts to water quality. However, if effective mitigation measures exist that would reduce the impacts so that water quality standards and permit conditions could be met, then significant impacts could be avoided. The Proposed Action would not result in an exceedance of a water quality standard or permit conditions through mitigation measures as described below. Therefore, the Proposed Action is not anticipated to result in significant impacts to water quality.

5.17.3 Minimization and Mitigation Measures for Water Quality

Mitigation for water quality impacts would include flow control and treatment BMPs in accordance with federal, state, and local regulations. Flow control BMPs are methods to reduce or prevent development-related increases in stormwater runoff at or near the source of the increases. Source control and runoff treatment BMPs are methods of reducing pollutants from entering the stormwater runoff and treating pollutant runoff as part of the storm drainage system.

Preventing the exposure of pollutants to rainfall and runoff is an important and cost-effective technique that can reduce the amount of pollutants in the runoff and the need for stormwater treatment. Source control BMPs that are particularly relevant to the Proposed Action include limiting the use of pesticides, limiting fueling facilities to designated areas, and minimizing the use of airfield deicers. State and Federal laws and regulations have been established that include standards for above ground and underground storage tanks, leak detection and overflow protection. Source control BMPs for the terminal area include maintaining separation of stormwater runoff from the terminal building roof, aircraft apron/deicing area, and parking lot areas. Keeping the stormwater runoff separate for these individual areas would allow for differing water quality treatment methods for the varying pollutants from each source.

Vegetated filter strips are runoff treatment BMPs designed to remove sediments and other pollutants coming directly off the pavement surface by slowing runoff velocities, trapping sediment and other pollutants, and providing minor infiltration and biologic uptake prior to entering the underground storm drainage network. Utilizing overland flow increases the travel time and reduces peak runoff rates. The airfield pavements would be designed to direct drainage from impervious areas across vegetated areas and through vegetated swales before collection in the underground storm drainage network. For drainage features on the airfield, proper consideration will need to be given during design to ensure ponding is minimized in compliance with airfield safety.

The underground storm drainage system for the terminal apron would likely be directly connected to the impervious areas. Therefore, proposed runoff treatment BMPs for the terminal apron would include oil control BMPs where fueling is expected. Additional controls are proposed to isolate runoff during aircraft deicing. The proposed deicing runoff management concept for the future terminal area along with a retrofit to the existing general aviation ramp is discussed in **Appendix K,** Appendix A.

Landside improvements such as the terminal and associated parking lot may incorporate other BMPs which are not compatible with airside activities, but are appropriate for landside areas. It is expected that the terminal roof runoff would not require additional runoff treatment and could be diverted directly to the flow control BMPs. The parking lot runoff would require runoff treatment and proposed BMPs including biofiltration swales which are vegetation-lined channels design to remove suspended solids, slowing runoff, and removing pollutants through filtration and settling.

The drainage routing from the existing development on the Airport will be unaltered and the existing flow control and treatment BMPs maintained. Infiltration potential is limited on the Airport due to soil conditions. Therefore, in addition to increasing flow routing and decreasing peak runoff rates, flow control would be provided through detention facilities. To optimize land for future development and reduce wildlife attractant potential, underground storage is proposed. The storm drainage network for the Proposed Action is proposed to drain separately from Airport Creek to allow for flow control and treatment prior to discharge to Airport Creek at the southwest end of the Airport. Improvements to the remnant portion of Airport Creek (parallel to Airport Road) are proposed to reduce sediment and vegetation challenges which exist within this open channel to remain and portions of the existing drainage network with capacity issues will be improved.

Based on the proximity of identified water sources and associated wellhead protection zones to the proposed construction activities and grading limits, some impacts to these sources could occur. Possible impacts may include reductions in water quantity (from diverting Airport Creek, or from altering drainage patterns), or issues with altered water quality (which could be caused by ground disturbing activities, alternate stormwater management techniques, or onsite contaminant spills). In order to implement a contingency plan for the possibility of these occurrences, a baseline assessment has been conducted in order to document pre-construction conditions of nearby water sources. This assessment was completed in order to create a means by which post-construction complaints regarding water source impacts could be

verified/validated in the event that they should arise.

It should be noted that the likelihood of direct or indirect impacts to any of the identified water sources as a result of the proposed project action is very improbable; however, it is possible. Out of all of the water sources identified within the study area (i.e. a total of 14 wells, and 4 surface water diversions) only 5 wells have been identified to have a marginal potential for sensitivity to the proposed project action. This list of potentially impacted water sources was determined based on information such as distance from anticipated grading limits, elevation of the water source, and other relevant factors. More detailed information regarding the process of determining the sensitivity of water sources is included in **Appendix K**. Pre-construction testing was completed at the five individual well sources that were deemed to have some potential sensitivity.

On June 27, 2014, three pumping tests were conducted. Two of the five wells could not be pump tested using conventional methods to gather the static water levels in the individual wells. On July 1, 2014, water quality samples were obtained (i.e. the Inorganic Contaminant (IOC) complete package) from all five wells and discharge tests were completed at the two wells that could not be pump tested on June 27. The discharge tests involved measuring the flow rate over a one-hour duration (note that this test did not measure the static water level within the well casing). The recorded water level data (limited to 3 of the 5 wells), discharge rate data and water quality analyses results are included within **Appendix K,** Appendix B. The documented baseline conditions can be compared to post-construction conditions to determine if any measureable impacts occurred at these five well sources. In the unlikely event that one of the five identified well sources is measurably impacted by the Proposed Action, the Airport will remedy the situation by providing a suitable alternative water source. Note that, all of the detailed BMPs and baseline analysis have been prepared based on industry standards.

5.18 WETLANDS AND WATERS OF THE US

Executive Order 11990, *Protection of Wetlands* and DOT Order 5660.1A, *Order on Preservation of the Nation's Wetlands*, require Federal agencies to avoid and minimize the impact of construction projects on wetlands. Wetlands are defined as areas inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction.

Airport Creek is the primary hydrologic feature within the study area. Sloped, depressional, and riverine wetlands, and networks of ephemeral streams, are also contained within the study area. A detailed wetland delineation report has been developed to document the presence of and potential impacts to wetlands and streams (see the Wetland Delineation Report in **Appendix I**).

Impacts to wetlands and streams were evaluated for the project by comparing existing conditions of those resources with the anticipated conditions associated with the No Action Alternative and the Proposed Action. The comparison included direct disturbance impacts, meaning those areas that would be filled/altered or intentionally changed in order to construct the alternative. Because wetlands and streams can serve a variety of environmental functions, such as water quality protection, wildlife habitat and flood

control, indirect impacts were also assessed based on changes to existing functions and values due to construction and operation of the alternative.

5.18.1 No Action Alternative

Because the No Action Alternative would not involve any construction or other activities, no wetlands or streams would be affected. Therefore, the No Action Alternative would have no adverse impacts on wetlands and streams.

5.18.2 Proposed Action

Runway and terminal improvements associated with the Proposed Action would result in land disturbing activities that would directly affect wetlands and streams (see **Figure 5-8**, *Anticipated Wetland/Stream Impacts*). Direct impacts to surface waters would include filling wetlands and piping waterways. Indirect impacts would include altering hydrologic conditions, established vegetative communities and stormwater runoff characteristics.

The Proposed Action would impact both directly and indirectly approximately 10.3 acres of riverine wetlands, 7.0 acres of sloped wetlands/ephemeral stream channels, 0.9 acres of depressional wetlands, and 8,460 feet of Airport Creek.

Because the study area contains jurisdictional wetlands and streams, the impacts to these resources were examined based on the thresholds of significance for wetlands and streams, as outlined in the FAA Environmental Orders. The threshold of significance for wetlands and streams is incorporated into FAA Order 1050.1E, which states:

- 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.
- 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.
- 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).
- 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.
- The action would promote development of secondary activities or services that would affect the resource.
- The action would be inconsistent with applicable State wetland strategies.

Summary of Anticipated Wetland Stream Impacts

Riverine Wetlands - 10.3 Acres

Sloped Wetlands - 7.0 Acres

Depressional Wetlands - 0.9 Acres

Airport Creek - 8,460 Feet

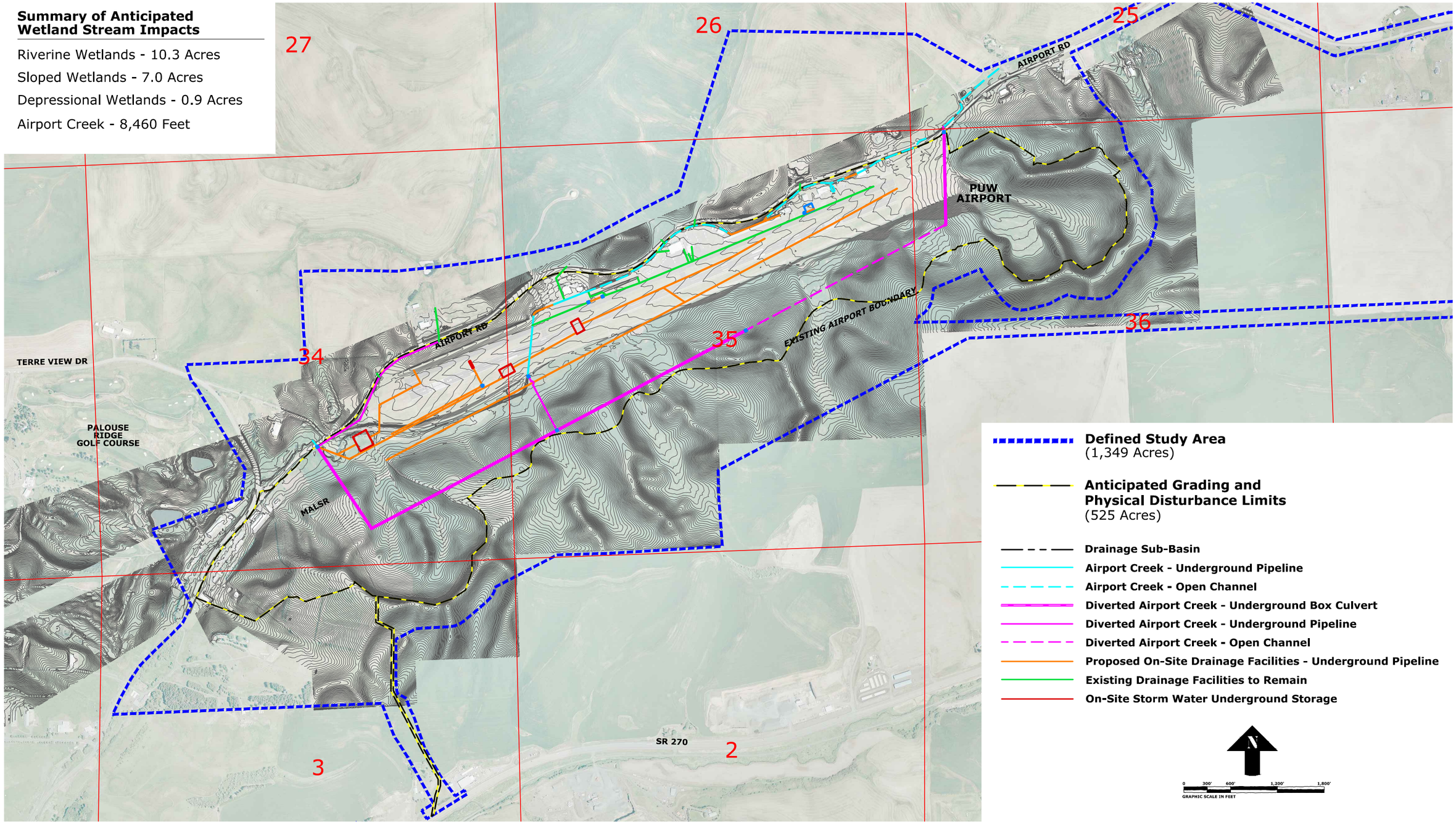


Figure 5-8

Anticipated Wetland/Stream Impacts

Consistent coordination has been maintained with the applicable regulatory agencies (namely, the USACE, Department of Ecology (DOE) and the Washington Department of Fish and Wildlife (WDFW)) throughout the development of the EA. A field verification site visit was conducted on April 25, 2013 with the USACE and on June 3, 2013 with the DOE to review the submitted Wetland Delineation Report findings. USACE concurred with the delineation finding on July 7, 2014 (see **Appendix K**, Water Resources). Based on ongoing correspondences with the regulatory agencies, the following federal and state permits would be required prior to the start of construction:

- Section 404 of the CWA - USACE Individual Permit;
- Section 401 of the CWA - DOE Individual Water Quality Certification; and,
- Hydraulic Permit Approval (HPA) – Administered by WDFW.

Impacts to wetlands and streams resulting from the Proposed Action, when considered with mitigation, would not be significant.

5.18.3 Minimization and Mitigation Measures for Wetlands and Waters of the US

In accordance with Executive Order 11990, direct and indirect impacts to wetlands and streams would be avoided and minimized to the greatest extent practicable. Best Management Practices (BMPs) that would be used to protect wetlands and streams adjacent to physical disturbances would include: working during low flow conditions; installation of silt fences along the perimeter of wetlands and streams, restricting equipment/materials storage to defined staging areas, utilization of water trucks as a means of fugitive dust control, installation of a sediment pond along the upslope portion of Airport Creek, and maintaining buffer zones surrounding the wetlands and streams whenever possible.

Impacts to Airport Creek and associated wetlands are unavoidable given the location of these features related to the existing and planned airport infrastructure. Unavoidable impacts would be mitigated as required under the aforementioned permitting processes. As discussed in Section 5.17, *Water Quality*, Airport Creek would be re-routed in order to reduce runway and taxiway crossings beneath pavement, accommodate future landside development, and allow for construction of the future airside improvements (see **Figure 5-7**, *Proposed Drainage Layout Plan*). In order to mitigate unavoidable impacts, an offsite mitigation site has been selected.

The selected mitigation site is located along the South Fork of the Palouse River, immediately southeast of the Town of Colfax. The mitigation site is within the same watershed resource inventory area (WRIA) sub-basin as the Airport and encompasses approximately 120 acres. Moreover, this site contains 14 acres of wetlands, a perennial stream segment (9,400 linear feet), and approximately 106 acres of adjacent buffer areas. The mitigation site is planned to be preserved in perpetuity and enhanced for optimal ecological functional lift.

The mitigation site's flood storage capacity, wildlife habitat, vegetative community diversity and stratification, and water quality functions are all planned to be measurably improved. Conceptually, the proposed mitigation measures yield the following elements:

- The creation of approximately 8 acres of riverine wetlands;
- The enhancement and preservation of 13 acres of riverine wetlands;
- The enhancement and preservation of 1 acre of sloped wetlands;
- The enhancement and preservation of approximately 98 acres of adjacent and contiguous upland buffer areas; and,
- The installation of 2 in-stream boulder clusters for fish habitat (totaling roughly 1,000 square feet).

Approximately, 15,000 native re-plantings would be installed in conjunction with the wetland creation and enhancement efforts. Other enhancement measures to be contained on the mitigation site include: installing wildlife friendly perimeter fencing, installing waterfowl nesting platforms; and, managing non-native noxious weeds with approved herbicide applications.

The wetland mitigation conceptual design has been vetted with the regulatory agencies (namely the USACE, the DOE and the WDFW) during a technical advisory meeting held on July 1, 2014. A draft cultural resources report has been developed for the proposed mitigation site. The draft findings of this report indicate that the mitigation site does not contain any historical or cultural resources. The Cultural Resources Report for the mitigation site is included in Appendix H.

5.19 WILD AND SCENIC RIVERS

According to the Wild and Scenic River list maintained by the National Park Service, there are no Wild and Scenic Rivers in or around the Pullman-Moscow Regional Airport. Therefore, neither the No Action Alternative nor the Proposed Action would affect Wild and Scenic Rivers.

5.20 CUMULATIVE IMPACTS

CEQ's regulations for implementing NEPA define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR §1508.7). NEPA requires that cumulative effects be evaluated along with the direct and indirect effects of the actions. As with direct and indirect effects, the No Action Alternative serves as the baseline against which to evaluate cumulative effects.

This analysis identifies past, present, and reasonably foreseeable actions that could contribute to cumulative impacts in specific environmental resource categories evaluated earlier in this chapter and highlights project-related effects that could contribute to cumulative impacts in these resource categories. The cumulative effects analysis necessarily involves assumptions, uncertainties, and data sets that may be incomplete. When considering the significance of the cumulative effects, the same thresholds of significance are used in identifying significant project-related cumulative effects as those used for each resource discussed previously in this chapter; such thresholds of significance are defined in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*. Where FAA Order 1050.1E has not established significance thresholds, it can be difficult to determine levels beyond which cumulative effects significantly

degrade a resource. Local, state, and federal standards for some resources would still apply, and other goals or objectives from land use management plans and other guiding programs may also be helpful. The analyses contained in this EA identify any defined thresholds. Where numerical thresholds are not available or cannot be determined, impacts are typically described in relative terms of magnitude.

In the environs surrounding the Airport, residential, commercial, and industrial development has generally been guided through the use of zoning and land use regulations. Areas immediately surrounding the Airport are generally agricultural in nature, and have experienced minor development in the past. It is expected that this level of growth will continue in compliance with the City of Pullman Comprehensive Plan.

In order to help evaluate possible cumulative impacts, research was conducted to identify projects that have occurred, are currently occurring, or are planned to occur near the Airport. **Table 5-2** provides a comprehensive list of past, present and reasonably foreseeable projects in the vicinity of the Pullman-Moscow Regional Airport. The subsections below the tables provide individual analyses for each environmental resource to determine potential cumulative impacts. None of these projects, in concert with the Proposed Action, are anticipated to contribute to cumulative environmental impacts.

Table 5-2: Past, Current, and Reasonably Foreseeable Projects in the Vicinity of PUW			
Project Name	**Source**	**Description**	**Past, Current, or Reasonably Foreseeable Timeframe**
Hampton Inn Hotel site Plan (10-11)	City of Pullman	Construct 93-room hotel on 4.3-acre site	Past
Itani Valley Road Apartments site plan	City of Pullman	Construct 16-unit apartment building on 27,000 sq-ft lot	Past
Airport Rescue and Fire Fighting Building Expansion Site Plan (11-10)	City of Pullman	Construct 3,500 Sq-ft addition to existing 3,500 sq-ft building	Past
Decagon Devices Addition Site Plan (11-15)	City of Pullman	Construct 27,000-sq-ft addition to existing manufacturing building	Past
Residence Inn Pullman site plan	City of Pullman	Develop 131-room hotel on 7.5 acre parcel	Past
WSU Visitor Center Site Plan	City of Pullman	Develop 4,400 sq-ft facility on 28,856 sq-ft parcel	Past
Valley Road Apartments site plan (13-8)	City of Pullman	Develop 6-plex on 11,675-sq-ft lot	Past
Sunnyside Heights Addition No. 7 Preliminary Plat	City of Pullman	Divide 3.4 acres into 11 lots and public streets in R2 Zone	Past
Pullman Airport Repeater Project site Plan (13-10)	City of Pullman	Install 40-foot-tall communication tower at water reservoir site	Past

Martin Stadium Football Operations Building	WSU - Pullman	Football Operations Building (84,192 GSF building) that provides a home for the Cougar football program.	Past
PACCAR Environmental Technology Building	WSU - Pullman	The PACCAR Environmental Technology Building (formerly the Clean Technology Laboratory Building) is a new 96,000 GSF building that houses science and engineering programs.	Past
Veterinary Medical Research Building - REC 4	WSU - Pullman	The Veterinary Medical Research Science Building provides 77,250 net square feet (approximately 128,000 gross square feet) biomedical research and support space for the health science teaching and research programs.	Past
Small Grain Plant Growth Facility	WSU - Pullman	The Small Grain Plant Growth Facility (19,000 gsf) provides state-of-the-art greenhouse facilities that comply with USDA guidelines.	Past
Northside Residence Hall Phase II	WSU - Pullman	This housing development will include apartment type suites, a variety of common spaces, and a recreation area on the ground floor.	Current
Arboretum and Wildlife Conservation Center	WSU - Pullman	The wildlife research center will be located on a 150 acre site on the eastern edge of the Pullman campus and will include the grizzly bear, mule deer and raptor facilities. (Note that the raptor facilities are only for demonstration). The arboretum will be approximately 100 acres	Reasonably Foreseeable
Digital Classroom Building	WSU - Pullman	A new high-tech classroom building on the Pullman campus. This project will use the Design Build method of delivery. An RFQ will be advertised in the Fall of 2014.	Reasonably Foreseeable
Museum of Art	WSU - Pullman	Renovations of about 9,400sf of gallery, support, storage, and office space in the Fine Arts Center; an addition of about	Reasonably Foreseeable

		8,000sf of galleries, storage, and support spaces; and reconfiguration of the entry plaza.	
Plant Science Building – REC 5	WSU - Pullman	The Plant Science Building REC #5 will be located on the WSU Pullman Campus and will provide a hub where biological sciences can be aggregated with a series of interconnected facilities that encourage interdisciplinary collaboration among faculty and students.	Reasonably Foreseeable
Washington Animal Disease Diagnostic and Research Facility	WSU - Pullman	75,000 gsf diagnostics facility to support the College of Veterinary Medicine's infectious disease research and surveillance programs, and will house the Washington Animal Disease Diagnostic Laboratory.	Reasonably Foreseeable

Source: Washington State University Current Planning and Development (2014) http://cpd.wsu.edu/CapitalProjects/Projects/, University of Idaho (http://www.uidaho.edu/facilities/main-subpages/projectinfo), City of Pullman Planning Newsletters (2010-2014) (http://www.pullman-wa.gov/departments/planning/planning-newsletters), City of Pullman 2014-2019 Capital Improvements Program, City of Moscow

For some resource categories, implementation of the Proposed Action would have no impact and would not, therefore contribute to cumulative impacts. The analyses in this chapter concluded that the Proposed Action would not impact the following resources:

- Coastal Resources
- Department of Transportation Act: Section 4(f)
- Wild and Scenic Rivers

The analyses earlier in this chapter determined whether the implementation of the Proposed Action would generate impacts in the categories below which, though not significant in themselves, must be analyzed for their possible cumulative effect. Therefore, the following subsections analyze the potential cumulative impacts for each environmental resource category in which the implementation of the Proposed Action might contribute to cumulative impacts when considered with other past, present, and reasonably foreseeable actions.

Air Quality

A significant impact to air quality could occur if the Proposed Action, when considered in combination with other past, present, or reasonably foreseeable actions, would result in one or more NAAQS for criteria pollutants being exceeded or adversely affect the attainment status for Whitman and Latah Counties.

As the analysis in **Section 5.1**, *Air Quality* of this chapter shows, existing and forecasted operations at PUW are below the threshold established by the FAA that indicates a potential for air quality impacts: activity levels for PUW are expected to be less than 180,000 operations and less than 1.3 million enplanements by 2061. The Proposed Action would slightly increase fuel emissions from a minor increase in taxi time and airport maintenance (i.e., snow removal) on the expanded runway, but this increase would be relatively small and would not produce enough air pollution to significantly alter the air quality with respect to the NAAQS. Past, present and future development in the vicinity of the Airport has resulted in and will likely result in increased emissions of air pollutants. However, the incremental increase in emissions from the proposed airport improvements and its future use, when added to the emissions sources in the area would be unlikely to produce a significant cumulative impact on air quality.

Activities associated with the implementation of the Proposed Action would likely produce dust and vehicle emissions during construction. Other planned projects may also generate similar air pollutants. The cumulative effects on air quality would depend on the timing of activities, duration of construction activities, and the proximity of the other project areas to PUW. It is anticipated that there are no reasonably foreseeable actions or projects in the vicinity of the Airport that would result in cumulative impacts to air quality during the construction of the Proposed Action at PUW.

Climate

The cumulative impact of the Proposed Action on the global climate when added to other past, present, and reasonably foreseeable future actions is not currently scientifically predictable. Aviation has been calculated to contribute approximately 3 percent of global carbon dioxide emissions; this contribution may grow to 5 percent by 2050. The proposed airside and landside improvements would increase GHG emissions slightly during construction, but would not have any long-term impacts on GHG emissions. At present there are no calculations of the extent to which measures individually or cumulatively may affect aviation's CO2 emissions. Moreover, there are large uncertainties regarding aviation's impact on climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions, with quantified uncertainties for current and projected aviation scenarios under changing atmospheric conditions.

Compatible Land Use

The Proposed Action, when considered with other past, present, and reasonably foreseeable future projects, would modify land uses within the vicinity of the Airport. The land use changes would be acceptable within the current land use and zoning regulations governing the areas. Land acquired as a result of the Proposed Action would be converted from privately held land (residential and agricultural) to publicly-owned land used for Airport purposes. No incompatible land uses would be located within the future 65 DNL noise exposure contour for Proposed Action; therefore it is not anticipated that cumulative aircraft noise impacts would result from the Proposed Action. Further, because the Proposed Action and other reasonably foreseeable future projects would comply with local zoning ordinances, no cumulative land use incompatibilities are expected.

Construction Impacts

There is often potential for cumulative impacts from construction activities. Construction activities could disturb soils, providing a foothold for some invasive species of plants. There would be construction impacts on the area of the Proposed Action for both the runway improvements (airside development) and terminal improvements (landside development). The use of haul trucks and construction vehicles within the development area and along the proposed haul route from SR 270 could also result in construction impacts.

Implementation of the Proposed Action, when considered with other present and reasonably foreseeable future actions, would cause additional impacts if construction activities occur at the same time. A review of ongoing and planned projects in the vicinity of PUW suggests several WSU projects just west of the Airport (the construction of WSU's Arboretum and Wildlife Research Center, Museum of Art, Plant Science Building and Washington Animal Disease Diagnostic and Research Facility) could potentially overlap with Airport construction. The initial development phase(s) of some of these projects could overlap in time with the implementation of the Proposed Action; however, it is not possible at this time to predict exactly when major construction activities for each project would occur.

Temporary and localized impacts from increased construction-related noise and short-term impacts to air and water quality could potentially occur during construction of the Proposed Action and other projects in the area. Due to the type of projects and the distance between the Airport and other reasonably foreseeable project work sites, it is unlikely that concurrent construction activities would produce significant noise impacts within the airport area (see Noise subsection). Construction activities would result in temporary increases in air pollutant emissions; however, the slight increase in air pollutant emissions are not expected to contribute to any significant changes in the area's air quality or the counties' ability to conform to National Ambient Air Quality Standards (NAAQS) (as discussed in the Air Quality subsection). Measures would be put in place to minimize fugitive dust generated from construction related activities. Additionally, best management practices (BMPs) would prevent and minimize impacts to local water quality resulting from the Proposed Action or other nearby projects. These BMPs would ensure that no cumulative impacts to water resources would occur as a result from the Proposed Action in conjunction with other nearby development and construction activities (see Water Quality subsection).

When considered with construction impacts from past, present, and reasonable foreseeable projects identified in the area, impacts would be minor due to the temporary nature of construction impacts. Construction activities may impact traffic slightly due to the disruption of traffic on several roads; however, these individual roads would not cumulatively produce an impact on the traffic in the area. Other routes can easily meet the capacity generated from the diverted traffic.

Farmlands

As discussed in **Section 5.7**, *Farmlands*, the land associated with the Proposed Action is not covered under the FPPA. However, because a portion of the land is used for agricultural activities, potential impacts to farmlands were evaluated. According to NRCS Form AD-1006, site assessment scores ranging from 160 to 200 indicate a project may have potential impacts, and scores over 200 signify a significant impact. The completed Farmland Conversation Impact Rating Form for the Proposed Action resulted in a score of 79.6. This score was substantially below the threshold identified for significant farmland impacts. Further, agricultural uses would be able to continue in the future on newly acquired lands for the Airport.

Local development in Whitman County has resulted in the conversion of farmland to non-agricultural uses, and the continued incremental loss of farmland due to urbanization is likely to continue in the future. However, the rate and timing of farmland conversions is difficult to predict. Due to this reason, and because the Proposed Action would not have a significant impact on farmlands, cumulative impacts to farmlands are not expected.

Floodplains

The Proposed Action would directly impact the floodplain at the Airport. To avoid adverse impacts, Airport Creek would be re-routed in order to reduce flows through Airport property. Other past, present, and reasonably foreseeable projects could potentially increase impervious surfaces with the addition of new facilities (i.e., the construction of WSU's Arboretum and Wildlife Research Center or Washington Animal Disease Diagnostic and Research Facility), thereby indirectly affecting peak flows associated with

floodplains. However, it is unlikely that these changes, in combination with the Proposed Action, would result in significant cumulative impacts to the floodplain because they would not result in: (1) a considerable probability of loss of human life; (2) likely future damage associated with the encroachment that could be substantial in cost or extent; or (3) a notable adverse impact on the floodplain's natural and beneficial floodplain values.

Hazardous Materials, Pollution Prevention, and Solid Waste

The Proposed Action would not adversely impact or be affected by any hazardous material sites. The Airport improvements when considered with other identified projects would not result in notable increases in the generation or handling of hazardous materials or solid waste within the vicinity of the Airport. Fuel storage, spill prevention, and emergency response measures in place during the implementation of the Proposed Action and other identified actions would enable projects to continue meeting applicable local, state, or federal laws and regulations regarding hazardous materials.

There is a potential for a temporary increase of solid waste as a result of construction of the Proposed Action, as well as for the construction of other projects in the area. The combined waste resulting from these projects is not anticipated to produce a significant cumulative impact; project construction would result in a temporary increase and would be within the region's capacity. Therefore, the Proposed Action, in combination with other past, present, and reasonably foreseeable projects, is not expected to result in a cumulative impact for waste resources.

Historical, Architectural, Archaeological, and Cultural Resources

There are four known sites of historical or archaeological significance within the APE that were determined to be eligible for the NRHP. None of these sites would be adversely affected by the Proposed Action. Throughout time, cumulative impacts to historic resources have occurred and will continue to occur due to the conversion of land for new development. These impacts would occur regardless of whether or not the Proposed Action is implemented. However, it is very difficult to predict specific impacts to historic resources as a result of other reasonably foreseeable future projects in the area; historic studies would need to be conducted and Areas of Potential Effect designated for each project. Because the specificity of these studies has not yet been determined, it is difficult to evaluate potential cumulative impacts to historic resources.

Light Emissions and Visual Impacts

The Proposed Action would not result in adverse effects due to changes in lighting (including center line lighting, MALSR, or touchdown zone lighting) along the runway at the Airport. Further, relocation of the Avista Energy Corridor along the south side of the airport is not anticipated to result in visual impacts.

The Proposed Action when considered with other past, present, and reasonably foreseeable future actions would cause minor visual changes within the vicinity of PUW. Ground disturbances and other visual changes to lands in the area would occur with the development of such projects as apartment buildings, hotels, or university facilities. These improvements would change local viewsheds in the area, however no

notable adverse visual impacts are anticipated. Therefore, the Proposed Action, in conjunction with other identified projects, is not anticipated to result in cumulative impacts to the visual environment.

Natural Resources, Energy Supply, and Sustainable Design

The Proposed Action would not substantially affect the community's natural resources or energy supply. While the extension of the runway would slightly increase taxiing time, it would not substantially increase fuel use. Similarly, additional items such as navigational aids and runway lights could result in minor increases in energy usage, but the increases would not be substantial. Other past, present, and reasonably foreseeable projects would use local resources and energy. However, there would not be a significant cumulative effect on these resources. None of these resources are in short supply in the Pullman area and the combined projects would not threaten the viability of these resources.

Noise

As summarized in Section 5.14**,** *Noise*, the Proposed Action would not result in noise impacts, as no sensitive land uses would be located in the 65 DNL and greater noise contour. Other projects in the area could increase noise due to surface traffic and temporary construction noise. However, because there would be no substantial long-term adverse noise impacts from the Proposed Action, there would not be an adverse cumulative impact.

Secondary (Induced) Impacts

The implementation of the Proposed Action, together with other ongoing and reasonably foreseeable future actions, would not cause major shifts in the patterns of population movement and growth, extensive demands for public services, or substantial changes in business or economic activity. While new apartment buildings, hotels or WSU facilities would accommodate demand, it is unlikely that they would create demand. Further, if or when new businesses, residences or developments are constructed near the airport cannot be predicted with any certainty. Therefore, because the Proposed Action would not result in significant secondary impacts, cumulative induced impacts are not expected.

Socioeconomic Environment, Environmental Justice, and Children's Environmental Health and Safety Risks

The Proposed Action when considered with other ongoing and reasonably foreseeable future actions would not result in impacts to environmental justice populations or increases in children's health and safety risks.

To avoid land use incompatibilities, the acquisition of two residences would be necessary to implement the Proposed Action. While the acquisition of these residences would not result in a noticeable effect on the local tax base, the development of such future foreseeable projects like apartment buildings and hotels could increase the County's property tax base, as new homes and associated improvements are built. However, the timing of such development cannot be accurately predicted at this time, therefore it is difficult to evaluate an effect on the local economy.

For those residents that would require relocation, there is not a housing shortage that would require concern over finding suitable housing for relocation. Further, the provisions of the Uniform Act would be followed to ensure fair and consistent acquisition of real property for affected landowners.

For these reasons, no cumulative adverse socioeconomic impacts are anticipated.

Water Quality

Final plans for any project would incorporate the provisions of AC 150/5370-10A to ensure minimal impact due to erosion, pollution, sanitary waste, and chemical use. Also, the Sponsor would need to develop a Spill Prevention Control and Countermeasures (SPCC) Plan and a Stormwater Pollution Prevention Plan (SWPPP). However, because no significant impacts would occur to water quality, the Proposed Action would not combine with any other projects to cumulatively create any significant impacts on water quality in the area.

Wetlands

Estimating direct impacts of reasonably foreseeable development to wetlands in the regional study area is difficult, as final design for many of the proposed projects has not yet been determined. Wetland degradation and loss is anticipated to continue as growth and development continue to occur in undeveloped areas. It is anticipated that each action would employ mitigation measures to reduce impacts on wetlands. Mitigation measures associated with the Proposed Action include a 100-acre mitigation site that would be preserved in perpetuity and enhanced for optimal ecological functional lift. The proposed mitigation measures would result in an enhancement of a wetland area that would be approximately three times the size of the total anticipated wetland impacts. Because of this mitigation, the incremental impact of the Proposed Action is not anticipated to result in cumulative impacts to wetlands.

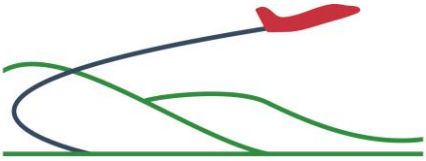
Wildlife and Vegetation

The Proposed Action would not adversely impact any fish, wildlife, or plants of special concern. While the implementation of other development projects may result in the displacement of some small wildlife species or birds, or a minor permanent loss of habitat for some species, it is not anticipated that other regional projects would result in adverse impacts to these same resources. Therefore, no cumulative impacts are expected for fish, wildlife, and plants.

The activities associated with the Proposed Action were determined to have “no effects” to sensitive species or species of concern. Further, the Airport property and proposed study area do not contain any high quality ecosystems. While the Proposed Action in conjunction with other past, present, and reasonably foreseeable future actions could cause minor impacts to common wildlife and/or vegetation in the airport area, it is likely that the wildlife would find refuge outside of construction activity or developed areas.

With these considerations in mind, implementation of the Proposed Action along with other past, present, or reasonably foreseeable projects would not result in significant cumulative impacts on fish, wildlife, or vegetation in the vicinity of PUW.

Chapter 6 Preparers



Chapter 6 Preparers

The following people were primarily responsible for the preparation of this Environmental Assessment.

Kevin Mulcaster, AICP
MEAD & HUNT, INC.
Project Management, Program Management, Alternatives Analysis, Document Preparation and Review

MEAD & HUNT, INC.

Jon Archibald, P.E.
Storm Water Management Analysis, Flood Plain Analysis, Environmental Analysis, Document Preparation

Jennifer Boehm, P.E.
Preliminary Engineering, Construction Analysis

Kerry-Lynn Brown
Document Preparation, Document Review

James Bullard
Document Preparation, Document Review

Scott Cary, P.E.
Alternatives Analysis, Preliminary Engineering, Construction Analysis, Avista Alternatives Analysis

Tim Dacey, AIA, LEED AP, NCARB
Terminal Area Plan

Ron Engle, P.E.
Preliminary Engineering, Construction Analysis

Adam Farnsworth
Preliminary Engineering, Data Management, Storm Water Management Analysis

Mike Flowers, AIA, LEED AP, NCARB
Terminal Area Plan

Trina Froehlich, CPA
Terminal Area Plan, Aviation Demand Forecasting

Mitchel Hooper, AICP
Project Management, Airspace Analysis, Alternatives Analysis, Document Preparation, Document Review

Rachel Jones
Environmental Analysis, Document Preparation

Jeff Kashiwada, P.E.
Storm Water Management Analysis, Flood Plain Analysis, Environmental Analysis, Document Preparation

Dean Mericas, Ph.D.
Storm Water Management Analysis, Deicing Analysis, Environmental Analysis, Document Preparation

Chad Moffett
Cultural Resources Analysis, Document Preparation

Brad Musinski, AICP
Noise Analysis, Document Preparation

Kari Nichols, P.E.
Storm Water Management Analysis, Flood Plain Analysis, Environmental Analysis, Document Preparation

Vince Paske
Design Visualization

Andy Platz, P.E.
Preliminary Engineering, Construction Analysis

Shan Rammah, EIT
Preliminary Engineering, Alternatives Analysis, Airspace Analysis, Document Preparation

Brad Rolf, P.E.
Document Preparation, Document Review

Al Romero
Airfield Electrical Analysis, Preliminary Engineering

Bill Rucker
Document Preparation, Document Review

Damon Smith, P.E.
Preliminary Engineering, Alternatives Analysis, Airspace Analysis

Doug Smith, P.E.
Preliminary Engineering, Construction Analysis

Tim Smith
Cultural Resources Analysis, Document Preparation

Lynn Wilson, AICP
Document Preparation, Document Review, Public Involvement Coordination

Marina Williams
Terminal Area Plan

Jennifer Wolchansky
Principal Document Preparer, Document Review, Environmental Analysis

JUB ENGINEERS, INC.

Vince Barthels
Wetland Delineation, Biological Assessment, Environmental Analysis, Document Preparation

Rick Door, P.E.
Alternatives Analysis, Preliminary Engineering, Construction Analysis

Mark Napier, P.E.
Preliminary Engineering, Water Resources Analysis, Document Preparation

TO ENGINEERS, INC.

Trey Dale, P.E.
Alternatives Analysis, Preliminary Engineering, Construction Analysis, Avista Alternatives Analysis

Dave Mitchell, P.E.
Alternatives Analysis, Preliminary Engineering, Construction Analysis, Avista Alternatives Analysis

J.R. Norvell, P.E.
Alternatives Analysis, Preliminary Engineering, Construction Analysis, Avista Alternatives Analysis

EPIC LAND SOLUTIONS, INC.

Hutch Goodman
Property Acquisition / Relocation Impact Analysis

Roxanne Grimm
Property Acquisition / Relocation Impact Analysis

Kelsey Kaszas
Property Acquisition Mapping

Casey Overcamp
Property Acquisition / Relocation Impact Analysis

De Ressa
Property Title Analysis

TRANSECT ARCHAEOLOGY

Lyle Nakonechny
Archaeological Field Investigations, Cultural Resources Analysis, Document Preparation