Final Environmental Impact Statement

Grant County International Airport Employment Center Project

Prepared by the
Port of Moses Lake and Grant County

November 2015

GRANT COUNTY
PLANNING DEPARTMENT
P.O. BOX 37 - 264 WEST DIVISION AVENUE
EPHRATA, WA 98823
(509) 754-2011 EXT 2501

November 6, 2015

Dear Reader,

The Final Environmental Impact Statement (FEIS) for the *Grant County International Airport (GCIA) Employment Center* project is currently available for review. If not enclosed with this letter, the FEIS is available on the Grant County Planning Department website at: http://www.grantcountywa.gov/Planning/. Additionally, hard copies of the FEIS are available for viewing at the Grant County Planning Department, Port of Moses Lake Office, and at the North Central Regional Library in Moses Lake.

The proposed project is located adjacent to the Grant County International Airport on an approximately 1,258-acre site comprised of properties located in the Port of Moses Lake (Port), City of Moses Lake (City) and Grant County (County). The FEIS evaluates potential impacts resulting from adoption of Planned Action Ordinances by the County and City, and development of the site as an employment center that is intended to strengthen the existing aerospace and manufacturing cluster at and near the airport.

The County, together with the Port and City, received an Advanced Planning Grant from Washington Department of Commerce to fund preparation of a Planned Action EIS for the *GCIA Employment Center* project. A Planned Action EIS provides detailed, comprehensive environmental review upfront during the planning stage of the overall project, thereby streamlining future permitting for individual projects.

A formal EIS Scoping process occurred from February 13, 2015, through March 3, 2015, and a public scoping meeting was held on February 25, 2015. On June 26, 2015, the Draft Environmental Impact Statement (DEIS) was issued and a 30-day public comment period was held. This comment period ended on July 27, 2015.

No comments were received on the *GCIA Employment Center* DEIS. As allowed by WAC 197-11-560(4), the *GCIA Employment Center* FEIS consists of an updated Fact Sheet and the DEIS.

Following issuance of the FEIS, a 7-day waiting period will be established during which no actions on the proposed employment center will be made (per WAC 197-11-460(6)).

Upon issuance of the FEIS there will be a 14-day appeal period. Any appeal must be based on the adequacy of the DEIS and FEIS. Under the Grant County Code (GCC 24.04.220), an appeal of the FEIS must be made to the Grant County Planning Department. The appeal period will end on November 20, 2015 at 5:00 PM.

If you have any questions or require clarifications of the above, please contact Grant County Planning Department at 509-754-2011, Ex. 2501.

Grant County, the Port of Moses Lake and the City of Moses Lake appreciate your interest and participation in the *GCIA Employment Center* project.

Sincerely,

Damien Hooper
Planning Director

FINAL
ENVIRONMENTAL IMPACT STATEMENT

for the

GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER PROJECT

Grant County and Port of Moses Lake

The Final EIS (FEIS) for the *Grant County International Airport (GCIA) Employment Center* project has been prepared in compliance with the State Environmental Policy Act (SEPA) of 1971 (Chapter 43.21C, Revised Code of Washington); the SEPA Rules, effective April 4, 1984, as amended (Chapter 197-11, Washington Administrative Code); and the ordinances adopted by Grant County and City of Moses Lake implementing SEPA (in Grant County Code (GCC) 24.04 and City of Moses Lake Code (MLC) 14.06). Preparation of this FEIS is the responsibility of the SEPA co-lead agencies: Grant County and Port of Moses Lake. The County and Port have determined that this document has been prepared in a responsible manner using appropriate methodology and they have directed the areas of research and analysis that were undertaken in preparation of this FEIS. This document is not an authorization for an action, nor does it constitute a decision or a recommendation for an action; in its final form, it will accompany the *Proposed Action* and will be considered in making further decisions on the proposal.

Date of Draft EIS Issuance..June 26, 2015

Date of Final EIS Issuance...November 6, 2015

PREFACE

The purpose of the Final Environmental Impact Statement (FEIS) is to:

- Identify and evaluate probable adverse environmental impacts that could result from development associated with the *Proposed Action* and development alternatives, and the No Action Alternative*;* and
- Identify measures to mitigate those impacts.

This FEIS does not authorize a specific action or alternative nor does it recommend for or against a particular course of action; it is one of several key documents that will be considered in the decision-making process for this project. A list of expected regulatory actions, including: licenses, permits and approvals is contained in the **Fact Sheet** to this FEIS (pgs. i-iv); this FEIS will accompany the applications specifically associated with the permit processes and will be considered as the final State Environmental Policy Act (SEPA) document relative to those applications.

The environmental elements that are analyzed in this FEIS were determined as a result of the formal, public EIS scoping process, which occurred from February 13 to March 3, 2015. The SEPA Determination of Significance/Scoping Notice was mailed to agencies and organizations. A public Scoping Meeting was held on February 25, 2015, and attended by approximately five individuals. A total of three comment letters were received; no one offered official comments at the public scoping meeting. Following review of the written comments, Grant County and the Port of Moses Lake determined the issues and alternatives to be analyzed in the EIS. They include 12 broad areas of environmental review consisting of: Earth; Water Resources; Plants and Animals; Environmental Health; Air Quality and Greenhouse Gases (GHG); Noise; Land Use/Relationship to Plans and Policies; Aesthetics; Historic and Cultural Resources; Transportation; Public Services; and Utilities.

The Table of Contents for this FEIS is contained on pgs. v-viii of the **Fact Sheet**. In general, the FEIS is organized into four major chapters:

- **Fact Sheet** (immediately following this Preface) provides an overview of the proposed action and development alternatives, permits and major approvals needed, contact information and the Table of Contents;
- **Chapter 1** (beginning on page 1-1) summarizes the description of the Proposed Actions, development alternatives and the No Action Alternative, as well as the environmental impacts, mitigation measures, and significant unavoidable adverse impacts;
- **Chapter 2** (beginning on page 2-1) provides a detailed description of the Proposed Actions, development alternatives and the No Action Alternative; and
- **Chapter 3** (beginning on page 3-1) is an analysis of potential impacts in the subject areas mentioned above for the Proposed Actions, development alternatives and the No Action Alternative. This chapter also identifies relevant mitigation measures and significant unavoidable adverse environmental impacts.

FACT SHEET

Name of Proposal ***Grant County International Airport (GCIA) Employment Center Project***

Proponent Port of Moses Lake (Port)

Location This FEIS identifies and analyzes conditions associated with the development of an employment center on approximately 1,258 acres of land on and adjacent to the Port. The site is located in Grant County and City of Moses Lake, and portions of the site are on the east edge of the Port property.

Proposed Action The Port is proposing an employment center intended to strengthen the existing aerospace cluster and existing manufacturing cluster at and near the GCIA.

The Proposed Action(s) for the site include:

- <u>Adoption of Planned Action Ordinances</u> by the County and City;
- <u>Future permitting and construction of infrastructure, buildings and other improvements</u> over the build-out horizon.

Other possible future actions related to the project could include:

- <u>Future approval of a Master Plan for the site</u> by the County, Port and City, to be based on a plan that has been agreed to by these parties and the other property owners at the site; and
- <u>Future execution of a Development Agreement</u> between the County, Port, City and other property owners at the site.

EIS Alternatives In order to conduct a comprehensive environmental review, two development alternatives meeting the Port, County and City's objectives are analyzed in this FEIS. These include Alternative 1 and Alternative 2, as well as a No Action Alternative. The development alternatives are described in detail in **Chapter 2** of this FEIS.

<u>Alternative 1</u> represents development of the *GCIA Employment Center* site with an emphasis on heavy manufacturing and warehouse uses. Under this alternative, a total of up to approximately 8.8 million square feet (sq. ft.) of new building area would be developed onsite over the approximately 20-year build-out period (approximately 6.3 million sq. ft. of new heavy manufacturing/warehouse building area and approximately 2.5 million sq. ft. of new aviation development/revenue support building area). The new building area onsite would provide capacity for a total of approximately 13,520 new employees.

Alternative 2 represents development of the site with an emphasis on light manufacturing and technology uses. Under this alternative, a total of up to approximately 10.1 million sq. ft. of new building area would be developed onsite over the approximately 20-year build-out period (approximately 7.3 million sq. ft. of new light manufacturing/technology building area and approximately 2.8 million sq. ft. of new aviation development/revenue support building area). The new building area onsite would provide capacity for a total of approximately 19,010 new employees.

Under the No Action Alternative the site would continue in its present largely vacant, undeveloped condition. No additional aerospace and/or manufacturing development would occur onsite at this time. The existing County, Port and City land use designations and zoning classifications would govern any future development of the site.

SEPA Responsible Official

Damien Hooper, Planning Director
Grant County Planning Department
P.O. Box 37
Ephrata, WA 98823

Telephone*:* 509-754-2011, Ex. 2501

Planned Action Environmental Review

This planned action FEIS has been prepared for the proposed *GCIA Employment Center* project based on information that is currently available and that has been prepared in support of this FEIS. It is anticipated that no subsequent environmental review under SEPA of this proposal will be necessary if proposed development is consistent with the conceptual land use map and assumptions that served as the basis for this FEIS and the Planned Action designations. If not, additional environmental review may be required under SEPA.

Required Approvals and/or Permits

Preliminary investigation indicates that the following approvals and/or permits may be required for the proposed *GCIA Employment Center* project from agencies with jurisdiction.[1] The approvals/permits pertain to development, construction and operation of development and to other regulatory actions that may allow or facilitate development, construction and operation of the proposed development. Additional permits/ approvals may be identified during the review process associated with specific projects.

Grant County, Port of Moses Lake and City of Moses Lake

- Planned Action Ordinances Adoption (County and City),
- Master Plan Approval (possible), and
- Development Agreement Execution (possible).

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1 An agency with jurisdiction is "an agency with authority to approve, veto, or finance all or part of a nonexempt proposal (or part of a proposal)" (WAC 197-11-714 (3)). Typically, this refers to a local, state or federal agency with licensing or permit approval responsibility concerning the proposed project.

Future permits for construction over the site build-out period could include, but are not limited to:

- Grading Permits,
- Building Permits,
- Mechanical Permits,
- Electrical Permits,
- Plumbing Permits,
- Utility Extension Agreements,
- Fire System Permits, and
- Stormwater Management Plan Approvals.

<u>Local and Regional Agencies</u>

- **Utility Service Providers**
  - Sewer, Water, Industrial Waste Discharge, Natural Gas, Electrical and Communication Service Availability.

<u>State of Washington</u>

- Section 401 Water Quality Certification Approval (if required),
- Construction Stormwater General Permit, and
- NPDES Stormwater Discharge Permit (if required).

Authors and Principal Contributors to this FEIS

This *GCIA Employment Center* project FEIS has been prepared under the direction of Grant County and Port of Moses Lake, as co-SEPA Lead Agencies. Research and analysis associated with this EIS were provided by the following consulting firms:

- **EA** – Lead EIS consultant; document preparation; environmental analysis – Land Use/Relationship to Plans and Policies, Aesthetics/Light and Glare, Public Services, Environmental Health
- **Reid Middleton, Inc.** – Master Planning, Utilities.
- **Heffron Transportation, Inc.** – Transportation
- **GeoEngineers** – Critical Areas, Plants and Animals
- **Landau Associates, Inc.** – Earth, Groundwater, Air Quality/GHGs, Noise
- **Cultural Resource Consultants, Inc.** – Historic and Cultural Resources

Location of Background Data

EA Engineering, Science and Technology, Inc., PBC
2200 Sixth Avenue, Suite 707
Seattle, WA 98121
Telephone: 206.452.5350

Grant County Planning Department
264 West Division Avenue
Ephrata, WA 98823

Date of Issuance of the Draft EIS

June 26, 2015

Date of Issuance of this Final EIS

November 6, 2015

Availability of this Final EIS

Copies of this FEIS have been distributed to agencies, organizations and individuals noted on the Distribution List (see **Chapter 6** of this document). Notice of Availability of the FEIS has been provided to organizations and individuals that requested to become parties of record, and that provided EIS Scoping comments.

The FEIS can be reviewed at the following public library:

Moses Lake Library
418 E 5th Avenue
Moses Lake, WA 98837

A limited number of complimentary copies of this FEIS are available – while the supply lasts – either as a CD or hardcopy from the Grant County Planning Department, which is located at the Grant County Planning offices, 264 W Division Avenue, Ephrata, WA 98823. Additional copies may be purchased from Grant County for the cost of reproduction.

This FEIS and the appendices are also available online at:
http://www.grantcountywa.gov/Planning/
http://www.portofmoseslake.com/
http://www.cityofml.com/

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- H Historic and Cultural Resources Report

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Chapter 1

SUMMARY

CHAPTER 1
SUMMARY

1.1 INTRODUCTION

This chapter provides a summary of the Final Environmental Impact Statement (FEIS) for the *Grant County International Airport (GCIA) Employment Center* project. It summarizes the Proposed Actions and EIS alternatives and describes the purpose and content of the FEIS and related topics in a question and answer format. The chapter also contains a matrix summarizing the probable significant impacts of the EIS alternatives, and a final list of mitigation measures to address these impacts.

The Port of Moses Lake (Port) is proposing an employment center on an approximately 1,258-acre site comprised of properties located in the Port, the City of Moses Lake (City) and Grant County (County). The proposed *GCIA Employment Center* is intended to strengthen the existing aerospace and manufacturing cluster at and near the GCIA. Full buildout of the site is assumed to occur over an approximately 20-year period. For the purposes of the FEIS analysis, the assumed buildout year is 2035.

The FEIS analyzes three alternatives: **Alternative 1** – Heavy Manufacturing/Warehouse Emphasis, **Alternative 2** – Light Manufacturing/Technology Emphasis, and **Alternative 3** – No Action Alternative. Proposed development could ultimately contain between approximately 8.8 million square feet (sq. ft.) and 10.1 million sq. ft. of new building area.

Per WAC 197-11-440(5), the goal of this FEIS is to analyze the environmental impacts associated with a sufficient range of alternatives that: 1) encompasses a broad range of development that the site can reasonably accommodate; 2) meets the applicant's objectives; and, 3) provides decision makers with relevant information needed to make decisions about the Proposed Actions.

The FEIS is also intended to fulfill the SEPA requirements for Planned Action environmental review for future development on the *GCIA Employment Center* site, per RCW 43.21C.031. After issuance of this FEIS, it is anticipated that the County and City will adopt Planned Action Ordinances for the site, which would reflect the decision that adequate environmental review had been conducted for specific projects/uses in the Ordinance. When specific applications for the development on the site are submitted in the future, the applications would be reviewed and a determination would be made by the County and City on whether the type and scale of the application is within the range of development assumptions analyzed in the FEIS and adopted as part of the Planned Action Ordinance; if not, additional environmental review may be required.

1.2 PROPOSED ACTIONS

The proposed actions for the *GCIA Employment Center* project, include the following:

- Adoption of Planned Action Ordinances by the County and City (consistent with WAC 197-11-164) that would indicate that adequate environmental review addressing the probable significant adverse environmental impacts of the Proposed Action(s) has been completed at this stage of the planning process, and that further environmental review under SEPA would not be necessary if it is determined that future development applications are consistent with the conceptual land use map and EIS alternatives which served as the basis for this FEIS and the Planned Action designation; and
- Future permitting and construction of infrastructure, buildings and other improvements over the buildout horizon (2035).

Other possible future actions related to the project could include:

- Future approval of a Master Plan for the site by the County, Port, and City, to be based on a plan that has been agreed upon by all parties and the other property owners at the site; and
- Future execution of a Development Agreement between the County, Port, City, and other property owners at the site.

1.3 DESCRIPTION OF THE FINAL EIS AND RELATED TOPICS

The following is a description of the purpose and content of the FEIS and related topics in a question and answer format.

Q1. What is the FEIS?

A1. This document is the FEIS for the *GCIA Employment Center* project. A FEIS is an environmental document that is prepared per the SEPA Rules (WAC 197-11), following the issuance of a Draft EIS (DEIS). An FEIS includes all substantive comments received on the DEIS (WAC 197-11-560(2)), responds to those comments, and, as applicable, explains how certain comments are addressed in information and analyses contained in the DEIS. If the lead agency does not receive any comments critical of the scope or content of the DEIS, they may state this in an updated Fact Sheet (WAC 197-11-440(2)), which shall be circulated per the requirements in WAC 197-11-460. The FEIS shall consist of the DEIS and an updated Fact Sheet. No comments were received on the *GCIA Employment Center* DEIS; there for the Updated Fact Sheet and DEIS comprise the FEIS.

Q2. What is contained in the FEIS and how is it organized?

A2. This FEIS consists of one volume and is divided into an updated Fact Sheet and three chapters.

- **Fact Sheet** - provides an overview of the proposed action and development alternatives, permits and major approvals needed, contact information and the Table of Contents;
- **Chapter 1** – provides a summary of the Proposed Action(s), development alternatives and the No Action Alternative, as well as the environmental impacts, mitigation measures, and significant unavoidable adverse impacts;
- **DEIS Chapter 2** - provides a detailed description of the Proposed Actions, development alternatives and the No Action Alternative; and
- **DEIS Chapter 3** – contains analysis of potential impacts of the Proposed Actions and development alternatives. This chapter also identifies relevant mitigation measures and significant unavoidable adverse environmental impacts.

Q3. What constitutes the EIS for this project?

A3. The EIS is comprised of the information and analysis in the DEIS together with an updated Fact Sheet. The following is a brief description of the DEIS.

DEIS

In June 2015, a DEIS for the *GCIA Employment Center* project was issued by Grant County and the Port of Moses Lake. In order to disclose environmental information relevant to the project and in compliance with SEPA, the DEIS evaluated two development alternatives (Alternative 1 – Heavy Manufacturing/Warehouse Alternative, and Alternative 2 – Light Manufacturing/Technology Alternative), as well as the No Action Alternative, as described below.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis

Alternative 1 would include development with an emphasis on heavy manufacturing and warehouse uses. An approximately 70:30 mix of these two industrial uses is assumed and a total of up to approximately 8.8 million sq. ft. of new building area would be developed onsite over the approximately 20-year build-out period (approximately 6.3 million sq. ft. of new heavy manufacturing/warehouse building area and approximately 2.5 million sq. ft. of new aviation development/revenue support building area). The heavy manufacturing/warehouse uses would primarily be located in the eastern and central portions of the site; the aviation development/revenue support uses would primarily be located in the western portion of the site (adjacent to and including a portion of the GCIA). The new building area onsite would provide capacity for a total of approximately 13,520 new employees. Roadway and utility infrastructure (i.e., stormwater, water and sewer) would be provided to support the proposed uses and two primary access points to the site are assumed to/from Stratford Road NE and Randolph Road NE

Alternative 2 – Light Manufacturing/Technology Emphasis

Alternative 2 would include development with an emphasis on light manufacturing and technology uses. An approximately 70:30 mix of these two industrial uses is assumed and a total of up to approximately 10.1 million sq. ft. of new building area would be developed onsite (approximately 7.2 million sq. ft. of new light manufacturing/technology building area and approximately 2.9 million sq. ft. of new aviation development/revenue support building area). The light manufacturing/ technology uses would primarily be located in the eastern and central portions of the site; the aviation development/revenue support uses would primarily be located in the western portion of the site (adjacent to and including a portion of the GCIA). The new building area onsite would provide capacity for a total of approximately 19,010 new employees. Roadway and utility infrastructure (i.e., stormwater, water and sewer) would be provided to support the uses proposed under Alternative 2 and two primary access points to the site are assumed to/from Stratford Road NE and Randolph Road NE.

Alternative 3 – No Action Alternative

Under this alternative the site would continue in its present largely vacant, undeveloped condition. No additional aerospace and/or manufacturing development would occur on-site at this time. The existing County, Port and City land use designations and zoning classifications would govern any future development of the site. Retention of the site in its existing condition would not provide the County, Port and City with the opportunity to realize their goals, including strengthening the existing aerospace and manufacturing cluster at and near the airport, and adopting Planned Action Ordinances that would streamline future permitting for individual projects.

Q4. What happens after the issuance of this FEIS?

A4. The *GCIA Employment Center* project FEIS will be used as a tool by the Port, County, and City (along with other considerations, analysis and public input) in their decision making process for the *GCIA Employment Center* project. This process is summarized below.

Subsequent to the issuance of the FEIS, the County and City intend to designate the *GCIA Employment Center* as a Planned Action via Planned Action Ordinances. This designation would reflect a decision by the County and City that adequate environmental review has been completed for specific projects/uses that are identified in the Ordinances. Once adopted, when specific applications for development on the site are submitted in the future, the applications would be reviewed and a determination would be made by the County or City on whether the type and scale of the proposal is within the range of development assumptions analyzed in the FEIS and adopted in the Planned Action Ordinances. If the type and scale of development is within the parameters analyzed in the FEIS and adopted in the Planned Action Ordinances, further environmental review would not be required to support the issuance of permits/approvals by the County or City for construction on the site. If a proposal is not within the parameters analyzed in the EIS and adopted in the Planned Action Ordinances, additional environmental review may be required. It should be noted that for future development permits that are subject to state or federal permits, the appropriate agencies would determine whether further environmental review is necessary.

Subsequent to the issuance of the FEIS, a Master Plan for the site could be prepared and approved by the County, Port and City, to be based on a plan that has been agreed to by these parties and the other property owners at the site. A Development Agreement could also be executed between the County, Port, City and other property owners at the site. The purpose of the agreement would be to specify the standards and conditions that will govern development of the property.

1.4 SUMMARY OF IMPACTS IDENTIFIED IN THE FEIS

The following table (**Table 1-1**) highlights and summarizes the potential impacts that would result from the alternatives analyzed in this FEIS. This summary table is not intended to be a substitute for the complete discussion of each element that is contained in **Chapter 3** of the FEIS.

Table 1-1
IMPACT SUMMARY MATRIX

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
<u>Earth</u> • Development activities would result in alteration of topography as a result of clearing and grading across much of the site. A total of approx. 2.7 million cubic yards of cut and fill would be required.	• Similar to Alternative 1.	• No clearing or grading would occur.
• Site grading, excavation, and construction associated with proposed development could cause erosion of exposed, potentially contaminated, soil. Temporary erosion and sedimentation control (TESC) measures and best management practices (BMPs) would be implemented to mitigate, and no significant erosion/sedimentation-related impacts are expected.	• Same as Alternative 1.	• No construction-related erosion or sedimentation would occur.
• Potential impacts to steep slopes or landslide hazard areas would not be anticipated, and the potential for seismic hazard area impacts would be low.	• Same as Alternative 1.	• No impacts to steep slope areas or seismic hazard areas would occur.
• A permanent stormwater management system would be installed that would minimize the potential erosion and sedimentation that could occur with operation of the proposed development.	• Same as Alternative 1.	• No additional stormwater management would be provided and no additional operation-related erosion or sedimentation would occur.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
<u>Air Quality/Greenhouse Gas (GHG) Emissions</u> • During construction activities, fugitive dust could cause a localized ambient concentration increase of particulate matter. Heavy truck and equipment diesel engines would also emit air pollutants. These emissions would be temporary and localized, and would likely be exceeded by emissions from existing pollution sources surrounding the project site. • Construction equipment and material hauling could temporarily cause traffic delays on streets adjacent to a construction area. If such delays increase traffic flow enough to reduce travel speeds by a significant amount, general traffic-related emissions could increase.	• Same as Alternative 1.	• No new development and no associated air quality issues would occur during construction.
• New industrial operations would cause air quality impacts. The nature of the air quality impacts would depend on the type of business that is operated. • A heavy industrial and warehouse emphasis would result in greater point and mobile source air quality impacts due to the use of more pollutant-emitting industrial equipment.	• Same as Alternative 1. • An emphasis on light manufacturing and technology would result in lower air quality impacts than Alternative 1 due to the use of less pollutant-emitting industrial equipment.	• No new development and no associated air quality issues would be generated during operation.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• New warehouse operations would increase regional vehicle miles travelled (VMT), which would contribute to greater tailpipe emissions throughout Grant County due to the use of more heavy-duty distribution trucks.	• New operations would result in less of an increase in VMT than Alternative 1 due to the use of less heavy-duty distribution trucks.	• No new development or emissions associated VMT increase would occur.
• New operations would increase GHG emissions above existing emissions by an expected approx. 416,788 MTCO2e per year.	• New operations would increase GHG emissions above existing emissions by an expected approx. 406,553 MTCO2e per year.	• No new development or associated GHG emission increase would occur.
Water Resources • Construction activities could result in short-term impacts to off-site surface water resources (e.g., Crab Creek) through erosion and sedimentation, as well as pollutants from construction equipment and vehicles. Construction activities would be subject to the Construction Stormwater General Permit issued by Ecology to avoid these impacts.	• Same as Alternative 1.	• No construction and associated potential to impact off-site surface waters would occur.
• No direct impacts to off-site wetlands, streams and their associated buffers are expected.	• Same as Alternative 1.	• No new development and potential to directly impact wetlands and streams would occur.
• A permanent stormwater control system would be provided in accordance with the *Ecology Stormwater Management Manual for Eastern Washington*. Stormwater would be retained within the site and water quality treatment would be provided for runoff from pollution-generating surfaces.	• Same as to Alternative 1.	• No new stormwater management system would be provided.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• The increase in impervious surfaces (approximately 75 percent more than existing conditions) would result in an increase in stormwater runoff rate and volume from the site, decrease in areas for stormwater infiltration and potentially introduce pollutants to surface water and groundwater. The proposed stormwater management system would be designed minimize these impacts.	• Similar to Alternative 1; however, Alternative 2 would generate less runoff due to the lower level of development and impervious surfaces (six percent less than Alternative 1).	• No increase in impervious surfaces or stormwater runoff would occur.
• Development would increase pollution-generating surfaces (e.g., roads and parking lots) and associated pollutants that could enter surface water runoff. The proposed stormwater management system would prevent the discharge of untreated stormwater to water resources.	• Similar to Alternative 1, although Alternative 2 would generate a lower level of pollutants due to lower level of development.	• No increase in stormwater pollutants would occur on the site.
• Operational impacts on groundwater could occur as a result of increased impervious surfaces on the site and associated reduced area available for groundwater recharge, as well the additional demand for domestic water.	• Same as Alternative 1.	• No new impervious surfaces would be added and no additional domestic water demand would occur that would impact groundwater.
<u>Plants and Animals/Critical Areas</u> • Noise associated with construction activities could result in short-term avoidance of the project site and vicinity by wildlife species.	• Same as Alternative 1.	• No construction would take place that would impact wildlife.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• New development operations would likely cause direct impacts to wildlife through an increase in noise and human presence and a loss of shrub-steppe and grassland habitat. There could also be indirect effects such as changing predator/prey relationships.	• Similar to Alternative 1, although Alternative 2 would have more noise and human presence impacts because of increased employment levels, and less habitat loss because there would be less impervious surfaces than Alternative 1.	• No additional impacts to wildlife or wildlife habitat would occur.
• Proposed development would result in a loss of suitable habitat for numerous plant and wildlife species, and a loss of breeding habitat, including potentially for federal ESA-listed species and Washington priority species such as: Striped whitesnake, Sagebrush lizard, Ferruginous hawk, Golden eagle, Greater sage-grouse, Clarks' grebe, Western grebe, Burrowing owl, Loggerhead shrike, Sagebrush sparrow, Merriam's shrew, Preble's shrew, Townsend's big-eared bat, Black-tailed jackrabbit, White-tailed jackrabbit, Washington ground squirrel, Great basin gilia, Wormskiold's northern wormwood, Palouse milk-vetch, White eatonella, Wanapum crazyweed, and Austin's knotweed.	• Similar to Alternative 1, although Alternative 2 would result in less reduction of habitat due to less impervious surfaces on the site.	• No additional impacts to wildlife or wildlife habitat would occur.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
Environmental Health • Site grading, construction of infrastructure and building development on the site could disturb contaminated soils and groundwater from past aircraft operations and associated aircraft industry activities at Larson Air Force Base, as well as gun club activities on City of Moses Lake property that could also enter stormwater. EPA has assumed responsibility for cleanup of portions of the site and vicinity and the Moses Lake Well Field site was added to the National Priorities List. Potential exposure pathways would be addressed by complying with the soil management provisions of the institutional controls established by EPA in the final cleanup/remediation plan, and ensuring compliance of all future site construction activities with these control measures.	• Same as Alternative 1.	• No development and potential to disturb contaminated soils and groundwater would occur.
• There is a potential for volatiles to be present in the subsurface soil that could generate vapors that could intrude into utility trenches and above-grade structures during development operations. This potential impact would be addressed in development design.	• Same as Alternative 1.	• No development and the potential for vapors to intrude into utility trenches and above-grade structures would occur.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• Industrial, manufacturing and warehouse uses could require storage and/or processing of hazardous materials as part of normal operations. This potential risk associated with exposure to these materials would be addressed by compliance with local, state and federal regulations	• Same as Alternative 1.	• No development and the potential storage or processing of hazardous materials would occur.
Noise • Temporary construction noise on and off the site (due to roadway improvements and traffic) would be typical of construction projects and, with identified mitigation measures, would not be anticipated to result in significant impacts.	• Same as Alternative 1.	• No construction and the potential to generate noise on and off-site would occur.
• Proposed development would not result in changes to aircraft traffic at the GCIA; there would be no new impacts associated with aircraft-related noise.	• Same as Alternative 1.	• No development and the potential to change aircraft traffic at the Grant County International Airport would occur.
• Industrial activities under Alternative 1 are not anticipated to result in significant noise impacts at identified noise-sensitive receivers.	• Alternative 2 would likely produce less industrial noise than Alternative 1.	• No development and potential noise from operational activities would occur.
• At full buildout, Alternative 1 would exceed the WSDOT substantial increase impact threshold of 10 dB(A) increase over existing conditions at the Endeavor Middle School due to roadway improvements.	• Similar to Alternative 1; however, Alternative 2 would likely produce more noise associated with traffic.	• No roadway improvements and associated noise impacts would occur.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
Land Use • Temporary construction impacts would occur during development, including dust emissions, increased noise, increased vibration and increased traffic.	• Construction-related land use impacts could be somewhat greater under Alternative 2, as there would be a total of approximately 10.1 million sq. ft. of development under Alternative 2 versus approximately 8.8 million sq. ft. of development under Alternative 1.	• No construction and associated temporary land use-related impacts would occur.
• Proposed development would contribute to the ongoing transition of the area to higher intensity uses and would result in the permanent conversion of primarily undeveloped, natural open space areas to new employment center uses that would be consistent with the site' s existing zoning.	• Same as Alternative 1.	• No new development would occur and the site would remain in its current largely undeveloped, natural condition.
• Under Alternative 1, approx. 1,084 acres would be developed, including new buildings, roadways and other impervious surfaces. The remaining approximately 147 acres would be in open space area, newly landscaped area and other vegetated areas. Approx. 8.8 million sq. ft. of new building area would be developed on the site, including approx. 2.2 million sq. ft. of Aviation Development uses, 274,500 sq. ft. of Revenue Support uses, and 6.3 million sq. ft. of Heavy Industrial uses.	• Under Alternative 2, approx. 1,007 acres of would be developed, including new buildings, roadways and other impervious surfaces. The remaining approx. 251 acres would be in open space area, newly landscaped area and other vegetated areas. Approx. 10.1 million sq. ft. of new building area would be developed on the site, including approx. 2.2 million sq. ft. of Aviation Development uses, 548,900 sq. ft. of Revenue Support uses, and 7.3 million sq. ft. of Heavy Industrial uses.	• No new development would occur on the site at this time.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• The types of activity within the site would be similar to surrounding uses, although the overall activity levels would increase when compared to the relatively undeveloped condition of the existing site. Development would represent a substantial increase in building density and associated activity levels on the site.	• Similar to Alternative 1.	• No new development would occur on the site at this time.
• Buildings designed to house heavy manufacturing and warehouse-type uses under Alternative 1 would typically be more efficiently housed in buildings that are one to two stories in height, consistent with zoning.	• Buildings designed for technology uses under Alternative 2 would be designed as two to three-story structures, consistent with zoning.	• No new development would occur on the site.
• New development would contribute to cumulative employment growth and intensification of land uses in the area. Increased site population would result in an increased demand for goods and services. The project could also indirectly generate additional development in the site vicinity.	• Similar to Alternative 1.	• No new development and potential indirect/cumulative land use impacts would occur.
Aesthetics/Light and Glare • New development on the site would change the aesthetic character of the site from its primarily undeveloped, naturally vegetated condition, to a new employment center focused on aerospace and manufacturing uses.	• Similar to Alternative 1.	• No new development would occur and the aesthetic character of the site would remain in its undeveloped condition.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• With the relatively flat elevation of the majority of the area surrounding the site, the potential for view impacts on surrounding uses of proposed development would be limited. Views of the site from immediately adjacent surrounding areas would include new buildings that could be similar to existing airport and industrial buildings on the site.	• Similar to Alternative 1.	• Views of the site would not change.
• New temporary sources of light and glare would be introduced to the site during construction activities, and would be controlled with regulations.	• Similar to Alternative 1.	• No construction would occur and no temporary light and glare sources would be located on the site.
• New development would result in an associated increase in light and glare on the site. The amount of light and glare generated would be typical of heavy industrial and warehouse development and significant light and glare impacts would not be anticipated.	• Similar to Alternative 1. Light and glare impacts would be typical of light industrial and technology development.	• No new development and potential increases in light and glare would occur.
<u>Historic and Cultural Resources</u> • As the site is considered to have a low potential to contain intact archaeological deposits, no significant impacts to archaeological sites are anticipated with development.	• Similar to Alternative 1; however, Alternative 2 would be more likely to impact unrecorded archaeological sites due to the higher density of development.	• No development and associated potential impacts to unrecorded archaeological sites would occur.
• Demolition, removal or physical alteration of structures over 50 years of age would impact potential historic structures/sites.	• Similar to Alternative 1; however, Alternative 2 would be more likely to impact unrecorded historic structures/sites due to the higher density of development.	• No development and impacts to potential historic structures/sites would occur.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
Transportation • Development would generate commuter trips by employees, deliveries of supplies, and ancillary trips. Alternative 1 would generate approx. 28,800 total trips per day.	• Development under Alternative 2 would generate approx. 40,500 total trips per day.	• No new development or associated vehicle trips would occur.
• The number of trips generated by full build-out would likely require substantial improvements along Stratford Road NE, with some improvements also needed along State Route (SR) 17. Certain improvements to Stratford Road NE would be required with approximately 50 percent of proposed development	• Similar to Alternative 1; however, Alternative 2 would generate more vehicle trips and would trigger the need for improvements to Stratford Road NE and SR 17 more quickly. Certain improvements to Stratford Road NE would be required with approximately 40 percent of proposed development.	• No new development would occur on the site; however, general background growth in the site vicinity would trigger the need for improvements to SR 17 in the future (by approx. 2032).
• Traffic could be accommodated by Road 7 NE and Tyndall Road NE until approximately 9,500 people are employed at the site. At that point the new potential North Access Road is needed. Beyond that employee threshold, additional improvements would be needed to disperse traffic among the three access points.	• Similar to Alternative 1; however, the need for the new potential North Access Road would be triggered more quickly due to the higher number of employees on the site under Alternative 2.	• No new development would occur and the new potential North Access Road would not be required.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• Intersection control improvements would be needed at several intersections including Stratford Road NE/Road 7 NE, Stratford Road NE/Tyndall Road NE, Stratford Road NE/North Access Road (new), SR 17/Randolph Road NE, and Randolph Road NE/Patton Boulevard NE. Improvements would be triggered based on the number of employees on the site. Extensive intersection improvements would not likely be needed until employment at the site exceeds 5,000 people.	• Similar to Alternative 1; however intersection control improvements would likely be triggered more quickly under Alternative 2 due to the higher number of employees on the site.	• No new development or associated employees would be located on the site and the potential to impact intersection operations in the area would not occur.
• Capacity improvements would likely be needed at the existing SR 17/Stratford Road NE interchange. However the specific improvements would be dependent on where employees of the project ultimately live.	• Same as Alternative 1.	• No new development or associated employees would work at the site; however, as described above, general background growth in the site vicinity would trigger the need for improvements to SR 17 in the future (by approx. 2032).
• Statistically, the number of collisions at study area intersections is likely to increase as traffic volumes increase as a result of the project. Traffic control measures that can help reduce the potential for collisions have been recommended.	• Same as Alternative 1.	• No development would occur; however, background growth would continue, and the number of collisions could increase.
• While most commuter trips would use personal vehicles, development of an employment center with substantial employment could generate an increased demand for transit.	• Similar to Alternative 1; however Alternative 2 would generate a higher demand due to the higher number of employees on the site.	• No new development would be located on the site and no increased demand for transit would be generated.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
Public Services • Construction activities could create an increased demand for police service. Increases in employees after full build-out would generate an incremental increase in demand for police service as well.	• Similar to Alternative 1; however, Alternative 2 would generate the need for more new officers at full build-out due to the greater number of employees on the site.	• No increase in demand for police services would occur.
• Construction activities would create an increased demand for fire and emergency services. The increase in employees would generate an incremental increase in demand for fire and emergency services as well. As development occurs, additional staff and equipment would be required to meet the demand.	• Similar to Alternative 1; however, the demand for fire and emergency services would be higher due to the greater number of potential employees on the site.	• No increase in demand for fire and emergency services would occur.
Utilities • Assumed development would generate increased demand for water for industrial and other operations. While the overall City system has capacity for the project, without drilling additional wells, full build-out would exceed the capacity of the current Larson zone. The Larson zone has capacity to accommodate a level of development between Phase 1 and 2 (approx. 3 million sq. ft.)	• Similar to Alternative 1; however, the Larson zone would have capacity to accommodate a level of development between Phase 2 and 3 (approx. 5 million sq. ft.).	• No increase in demand for water would occur.

Alternative 1 – Heavy Manufacturing/Warehouse Emphasis	Alternative 2 – Light Manufacturing/Technology Emphasis	Alternative 3 – No Action Alternative
• New development would generate up to 4.94 million gallons per day (MGD) of combined industrial discharge and domestic sewage from both assumed heavy industrial and warehouse uses. Full build-out limits the ability of the Larson Treatment Plant to service growth in the balance of the Larson Treatment Plant service area. However, approx. 5 million sq. ft. of development could be accommodated by the Larson Plant before improvements would be required.	• Similar to Alternative 1, although full build-out for Alternative 2 would create a total sewage generation rate of 2.96 MGD and would require a plant expansion. Approx. 3.5 million sq. ft. of development could be accommodated by the Larson Plant before improvements would be required.	• No new sanitary sewer demands would be created.
• Alternative 1 is anticipated to generated demand for 67.71 megawatts (MW) of electrical power at full build-out. The Tyndall portion of the Grant County Public Utility District (GCPUD) distribution system is at capacity but could accommodate incremental new development with demand less than 5 MW. GCPUD has indicated that a new substation would have the capacity to serve an approximately 78 MW electrical load, which is large enough to accommodate build-out of the project.	• Similar to Alternative 1; however, Alternative 2 is anticipated to generated a greater demand for electrical power at full build-out (72.93 MW).	• No increase in demand for electricity would occur; however the Tyndall portion of the GCPUD power distribution system is at capacity and any new development that requires more than 5 MW would require additional improvements to the system.
• Cascade Natural Gas Corporation has indicated that the existing natural gas system serving the site and surrounding area has ample capacity to serve the loads projected for full build-out of the project.	• Same as under Alternative 1.	• No increase in demand for natural gas would occur.

1.5 MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

The following lists the mitigation measures and significant unavoidable adverse impacts that would potentially result from the alternatives analyzed in this FEIS. This list is not intended to be a substitute for the complete discussion of mitigation measures within each element that is contained in **Chapter 3** of the FEIS.

Proposed mitigation measures are those actions which the applicant has proposed at this point in time, and/or that are required by code, laws, or local, state, and federal regulations.

Possible mitigation measures are additional actions that could be undertaken, but are not necessary to mitigate significant impacts, and are above and beyond those proposed by the applicant

Earth

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures address the potential earth-related impacts that could result from the construction and long-term use of Alternative 1 or 2.

Prior to and During Construction

- Site-specific subsurface investigations and geotechnical analyses would be performed as part of design and permitting of infrastructure and buildings associated with future site development.
- During construction, TESC measures and BMPs would be employed to control erosion. These measures could include the following:
  - Limit areas of exposure;
  - Schedule earthwork during drier times of the year;
  - Retain vegetation where possible;
  - Seed or plant appropriate vegetation on exposed areas as soon as earthwork is completed;
  - Route surface water through temporary drainage channels around and away from disturbed soils or exposed slopes;
  - Intercept and drain water from any surface seeps, if encountered;
  - Use silt fences, temporary sedimentation ponds, or other suitable sedimentation control devices to collect and retain eroded material;
  - Cover exposed soil stockpiles and exposed slopes with plastic sheeting, as appropriate;

- Use straw mulch and erosion control matting to stabilize graded areas and reduce erosion and runoff impacts to slopes, where appropriate;
- Incorporate contract provisions allowing temporary cessation of work under certain, limited circumstances, if weather conditions warrant; and
- Construct stabilized construction entrances with rock pads or truck washing stations to limit excess soil materials from leaving the site.

- During the appropriate dry seasons, wherever possible, soils excavated from the site would be reused as on-site structural fill.
- Standard construction measures, such properly designed and installed temporary excavation shoring systems, and properly constructed open excavations, would be used to reduce the potential for adverse excavation impacts.
- Any necessary fill would be designed to control potential settlement impacts at adjacent structures/surfaces. As necessary, adjacent structures/surfaces would be monitored during construction to verify that no adverse settlement occurs.
- If drilled shafts are used to support buildings, they would include casing to control caving soils. As necessary, adjacent structures/surfaces would be monitored to verify that no adverse settlement and vibrations occur.
- The appropriate management of contaminated soils that could be disturbed and groundwater that could be encountered during redevelopment of the site would be addressed through the cleanup/remediation process and by institutional control requirements overseen by the Environmental Protection Agency (EPA) (see Section 3.5, **Environmental Health**, for details).
- Buildings and infrastructure would be designed in accordance with the most current version of the International Building Code (IBC) to address potential life safety impacts from seismic events.

During Operations

- A permanent stormwater control system would be installed in accordance with the Washington State Department of Ecology (Ecology) *Stormwater Management Manual for Eastern Washington* to avoid long-term erosion, sedimentation and pollutant impacts on off-site water resources.

Air Quality/GHG Emissions

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures address the potential air quality/GHG-related impacts that could result from the construction and long-term use of Alternative 1 or 2.

Prior to and During Construction

- As necessary, construction contractors would prepare and implement air quality control plans for construction activities at the site. These plans would feature BMPs to control fugitive dust and odors emitted by diesel-fired construction equipment, and could include:
    - Use water sprays or other non-toxic dust control methods on unpaved roadways;
    - Minimize vehicle speed while traveling on unpaved surfaces;
    - Prevent track-out of mud onto public streets;
    - Cover soil piles when practical;
    - Minimize work during periods of high winds when practical;
    - Maintain the engines of construction equipment according to manufacturers' specifications; and
    - Minimize idling of equipment while the equipment is not in use.
- As necessary, if there is regular heavy traffic during some periods of the day during construction, haul traffic would be scheduled during off-peak times (e.g., between 9:00 AM and 4:00 PM) to minimize the effect on traffic and mitigate indirect increases in traffic-related emissions.
- Burning of slash or demolition debris would not be permitted without approval from Ecology.
- As required by Ecology, any future development that could potentially cause an increase of criteria or toxic air pollutant emissions that would exceed exemption threshold levels specified in WAC 173-400-110 or WAC 173-460-150 would obtain a Notice of Construction Approval order prior to construction and use best available control technology (BACT) on stationary equipment to minimize emissions.

During Operations

- As possible, trip-reduction and energy conservation measures would be provided to reduce GHG reductions.
- As possible, GHG emission reductions would be achieved by using building design and construction methods that incorporate recycled construction materials, reduce space heating and electricity usage, incorporate renewable energy sources and reduce water consumption and waste generation (see **Appendix F** for further possible mitigation measures to reduce GHG emissions).

Water Resources

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures would address the potential impacts to water resources that could result from the construction and long-term operation of Alternative 1 or 2.

Prior to and During Construction

- Construction activities would be subject to the Construction Stormwater General Permit issued by Ecology.
- TESC and BMPs would be implemented to control stormwater runoff during construction, consistent with the *Ecology Stormwater Management Manual for Eastern Washington.*
- Stormwater management systems would be sited and designed in accordance with institutional controls defined by EPA in the final remediation plans for the Moses Lake Wellfield Superfund Site (see Section 3.5, **Environmental Health**, for details)

During Operations

- Permanent stormwater control system(s) would be designed and installed in accordance with the *Ecology Stormwater Management Manual for Eastern Washington* to avoid long-term erosion, sedimentation and pollutant impacts on off-site water resources.

Plants and Animals

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures address the potential impacts to plants and animals that could result from the construction and long-term use of Alternative 1 or 2.

Prior to and During Construction

- Future development would be subject to Grant County and City of Moses Lake regulations at the time of permit issuance. Additional site-specific critical area studies could be required to evaluate potential impacts and identify required mitigation.
- TESC and BMPs would be implemented to control stormwater runoff during construction to prevent erosion, sedimentation and pollutant impacts on off-site water resources and associated impacts on aquatic habitat and species.
- Burrowing owl nesting surveys would be conducted to determine the presence of these species within the specific site area at the time of development applications.
- Work would be restricted within 0.5 mile of active burrowing owl nests.

- Plant surveys should be conducted to determine the presence of the rare plant species within specific site areas at the time of development applications.
- Landscaping would be included in proposed development that would meet or exceed Grant County and City of Moses Lake landscaping requirements. If native plant species are used, this would serve to replace a portion of the habitat for wildlife species onsite.
- If impacts to priority plant and wildlife species are unavoidable, appropriate mitigation measures would be implemented as needed. Currently, there is a burrowing owl mitigation site that was constructed for another project within the vicinity of the site. Appropriate mitigation for burrowing owls could include expanding this mitigation area or identifying another appropriate mitigation area.
- Specific project design would respond to guidance from the Washington State Department of Fish and Wildlife (WDFW) on Priority Habitats and Species Management Recommendations, Grant County, the City of Moses Lake and the Port of Moses Lake for species that are determined to be at the project site.

During Operations

- A permanent stormwater control system would be installed to prevent long-term erosion, sedimentation and pollutant impacts on off-site water resources and associated impacts on aquatic habitat and species.

Environmental Health

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures would address the potential environmental health-related impacts that could result from the construction and long-term operation of Alternative 1 or 2.

Prior to and During Construction

- **Soil Management** – Compliance with the soil management provisions of site institutional controls would be ensured, and compliance of all future site construction activities with these control measures would be ensured as well.
- **Worker Health & Safety** – Compliance with construction worker safety protocols defined as part of site's institutional controls would be ensured, and compliance of all future site construction activities with these control measures would be ensured as well.
- **Stormwater Quality Impacts** – Cover soil would be maintained over contaminated soils where practicable, and/or stormwater treatment and monitoring during construction activities that could disturb contaminated soils would be implemented.
- **Groundwater Quality** – Compliance with the site-specific institutional controls during site cleanup and development construction activities would be ensured.

- **Facility/Land Use Siting** – A review of use restrictions associated with institutional control plans would be incorporated as part of future building permit reviews, and either: 1) would ensure that all proposed uses comply with these use restrictions, or 2) would require conducting additional removals of the contained hazardous materials in coordination with local, state and federal agencies, as necessary, to remove the use restrictions.
- **Discovery of New Cleanup Issues** – Compliance with release reporting, investigation and applicable cleanup provisions of the applicable regulations would be ensured.

During Operations

- **Soil Management and Worker Safety** – Utility corridors would initially be developed in clean backfill material where practicable. Where this is not practicable, the same soil management and worker safety provisions applicable to construction activities (e.g., compliance with worker training, monitoring and work practice requirements defined in site institutional control plans) would apply to utility maintenance or other subsurface maintenance activities.
- **Future Hazardous Materials Use** – The use, storage and/or processing of hazardous materials would comply with local (e.g., fire department hazardous materials regulations), state (e.g., Washington underground storage tank regulations) and federal regulations (e.g., federal spill prevention control and counter-measures requirements) relating to the use, storage or processing of hazardous materials.

Noise

Required/Proposed Mitigation Measures

The following identified mitigation measures address the potential noise impacts that could result from the assumed construction and long-term use under Alternative 1 or 2.

Prior to and During Construction

- Nighttime construction would not be allowed without approval from the local agencies (City of Moses Lake or Grant County). Local regulations do not regulate noise from daytime construction activities. Regardless, based on site-specific considerations at the time of construction permit review, construction contractors could be required to implement noise control plans for construction activities in the site area for daytime activities.
- Construction noise could be reduced by using enclosures or walls to surround noisy stationary equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing time of operation and locating equipment as far as practical from sensitive receivers. To reduce construction noise at nearby receivers, the following mitigation measures could be incorporated into construction plans and contractor specifications.
    - Locate stationary equipment away from receiving properties;

- Erect portable noise barriers around loud stationary equipment located near sensitive receivers;
- Limit construction activities to between 7:00 AM and 8:00 PM on weekdays and between 9:00 AM and 6:00 PM on weekends and holidays to avoid sensitive receptors during nighttime hours;
- Turn off idling construction equipment; and,
- Require contractors to rigorously maintain all equipment.

During Operations

- **Industrial Noise Sources** – Future industrial operation would be required to comply with the applicable noise regulations which establish permissible noise levels from industrial noise sources at receiving off-site properties.
- **Traffic Noise Sources** – Development exceeding approximately 94 percent of assumed full development under Alternative 1 and exceeding 85 percent of assumed full development under Alternative 2, would require mitigation to limit increased traffic noise on Randolph Road from significantly impacting Endeavor Middle School. Mitigation measures could include:
  - Limiting traffic on Randolph Road to a level not exceeding 94 percent of total assumed trips under Alternative 1 and 85 percent of total assumed trips under Alternative 2; or,
  - Construction of a noise barrier between the school and Randolph Road as the level of traffic on Randolph Road approaches 94 percent of total assumed trips under Alternative 1 and 85 percent of total assumed trips under Alternative 2.

Land Use

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures address the potential land use impacts that could result from the construction and long-term use of Alternative 1 or 2.

Prior to and During Construction

- Development of the *GCIA Employment Center* under Alternatives 1 and 2 would be consistent with the site's existing zoning classifications and new development would be required to comply with applicable zoning requirements for the site, including maximum building heights, maximum lot coverage, building setbacks, landscaping, visual screening and performance standards for operation (e.g., for noise, air quality, odors, hazardous materials, etc.).
- A Development Agreement could be executed between the County, Port, City and other property owners at the site. This agreement could specify the standards and conditions that would govern development of the site.

- A Master Plan could be developed for the site for review and approval by the County Port and City. This plan would contain more definitive information on site development, infrastructure, parking, and landscaping, and could represent a more cohesive, predictable concept for development of the site.

Aesthetics/Light and Glare

Mitigation Measures

The following mitigation measures address the potential aesthetics and light and glare impacts that could result from the construction and long-term use of Alternative 1 or 2.

- The development of the *GCIA Employment Center* under Alternatives 1 and 2 would be consistent with the existing zoning classifications for the site and new development would be designed to meet the applicable requirements of the Grant County Unified Development Code, the City of Moses Lake Municipal Code and the Grant County International Airport Master Plan, including requirements to minimize negative impacts on aesthetics from new development (e.g., maximum building height, building site coverage, separation of buildings, landscaping and visual screening).
- A Development Agreement could be executed between the County, Port, City and other property owners at the site. This agreement could specify the standards and conditions that would govern development of the site.
- A Master Plan could be developed for the site for review and approval by the County, Port and City. This plan would contain more definitive information on site development, infrastructure, parking, and landscaping, and could represent a more cohesive and predictable concept for development of the site.

Historic and Cultural Resources

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures address the potential impacts to historic and cultural resources that could result from the construction and long-term use of Alternatives 1 or 2.

Prior to and During Construction

- Formal consultation with Tribes in Washington State would be initiated to determine which Tribes have an interest in the site.
- A protocol/checklist for review of projects that includes a form letter for the Washington State Department of Archaeology and Historic Preservation (DAHP) would be established.
- Cultural resources surveys would be conducted prior to specific development actions.

- The historical significance of structures within the site that are over 50 years old would be documented and evaluated prior to specific development actions.
- Consideration would be given to establishing a team to manage the critical area designation of archaeological sites. The team could be responsible for data management and consultation with Tribes, agencies, developers and/or other stakeholders. A member of the team could be assigned to search for grants and other funding sources in order to begin collecting data to improve the understanding of precontact land use at the site.
- Consideration would be given to establishing a heritage program that would help guide development by incorporating a heritage theme in the *GCIA Employment Center*.
- Consideration would be given to partnering with existing businesses or agencies (e.g., Port of Moses Lake, ASPI Group) with a strong interest in history, and which likely maintain good historical records.
- Should any potentially significant archaeological or historic sites be encountered during development of the proposal that could not be avoided, impacts could potentially be minimized by measures including:
    - Limiting the magnitude of the proposed work;
    - Modifying proposed development through redesign or reorientation to minimize or avoid further impacts to resources;
    - Rehabilitation, restoration or repair of affected resources;
    - Preserving and maintaining operations for any involved significant historic structures;
    - Archaeological monitoring, testing or data recovery excavations; and/or
    - Documentation of historic elements of the built environment through photographs, drawings and narrative, at the appropriate level based upon DAHP standards.
- In the event that ground disturbing or other activities result in the inadvertent discovery of archaeological deposits, work would be halted in the immediate area and DAHP would be contacted. Work would be halted until such time as further investigation and appropriate consultation is concluded.
- In the unlikely event of the inadvertent discovery of human remains, work would be immediately halted in the area, the discovery covered and secured against further disturbance, and contact made with law enforcement personnel, consistent with the provisions set forth in RCW 27.44.055 and RCW 68.60.055.

Transportation

Required/Proposed Mitigation Measures

The needed roadway configuration and intersection control would change with increased employment at the site, regardless of whether that employment is related to development under Alternative 1 or 2. The following required/proposed mitigation measures address the potential transportation-related impacts that could result from development under Alternative 1 or 2.

Pre-Development Activities

- Prior to development, an implementation and funding plan for the phased transportation mitigation package would be prepared.
- Grant County would consider partnering with the City of Moses Lake and WSDOT to perform detailed study of the SR 17/Stratford Road NE interchange.

Transportation Improvements

- Intersections would be improved per the threshold guidance listed in **Table 3.10-7**. The potential North Access Road could be deferred until development reaches approximately 9,500 employees.
- Stratford Road NE and SR 17 would be widened, as needed, between and adjacent to improved intersections to increase capacity (see guidance in **Figure 3.10-6** and **Figure 3.10-7**).
- Truck movements would be provided for at all new roundabouts and intersections.
- The Port, City and County would work with Grant Transit Authority to extend existing routes from Big Bend Community College to the site, or to establish new routes when demand warrants.
- Pedestrian facilities would be constructed on at least one side of the new roads developed for the project. The optimal location for new crosswalks at intersections would be assessed during the design of those improvements.

Public Services

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures address the potential impacts on public services (police service and fire and emergency medical service) that could result from the construction and long-term use of Alternative 1 or 2.

Police Services

- On-site security would be provided during construction to reduce the potential for construction-related incidents. Such measures could include fencing and securing areas where construction equipment is stored onsite.

- Traffic control measures would be provided for construction vehicles and equipment during the construction process and traffic mitigation measures would be provided to minimize the operational traffic impacts of the *GCIA Employment Center* (see Section 3.10, **Transportation**, for details).

Fire and Emergency Services

- Construction worker safety measures would be implemented during development on the site, in accordance with applicable Occupational Safety and Health Administration (OSHA) standards.
- All new buildings on the *GCIA Employment Center* site would be constructed in compliance with applicable International Building Code and International Fire Code requirements and standards, as adopted by Grant County and the City of Moses Lake.

Other mitigation measures that would be implemented to address impacts on public services include:

- A portion of the tax revenues generated from future development of the *GCIA Employment Center* site would help to offset the increased demands for police and fire services.

- Increased demand for police and fire services from future development would also be addressed by Grant County and City of Moses Lake capital facilities planning processes and the planning processes of Grant County Sheriff's Office, Moses Lake Police Department, Grant County Fire District #5 and Moses Lake Fire Department.

Utilities

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures would address the potential utility impacts associated with development of the *GCIA Employment Center* site under Alternative 1 and 2.

Water

- The Larson zone of the City of Moses Lake water system has adequate capacity to accommodate a level of development between Phase 1 and Phase 2 under Alternative 1 (approximately 3 million sq. ft.) and a level of development between Phase 2 and Phase 3 under Alternative 2 (approximately 5 million sq. ft.), including a two percent background growth factor. However, additional water system wells would need to be drilled to serve full build-out of Alternative 1, and would likely be necessary for full build-out of Alternative 2 (Alternative 2 would use most of the existing capacity of the Larson zone).

- The City would monitor water demand by screening development applications to determine anticipated generation rates for development. The overall City system is projected to have capacity to meet the Larson zone water needs and would provide a supply buffer as plans are developed for well drilling and expansion of the Larson zone supply and distribution system once development demand approaches system capacity.

Sanitary Sewer

- The City of Moses Lake Larson Treatment Plant has capacity to treat a level of assumed development between Phase 2 and Phase 3 under Alternative 1 (approximately five million sq. ft.) and an assumed level of site development between Phase 1 and Phase 2 under Alternative 2 (approximately 3.5 million sq. ft.), including a two percent background growth factor. However, the City would require an increase in treatment capacity to accommodate flows associated with full build-out of both alternatives.

- The City would monitor the sewage treatment capacity by screening development applications to determine anticipated sewage generation rates for the proposed development. The City would monitor projected incoming flows through the screening process and begin plans for expansion when the facility reaches 80 percent capacity, which is anticipated to occur around 2024 (see **Figure 3.12-3**).

- The Port of Moses Lake industrial wastewater treatment system has some capacity to treat additional volumes of industrial wastewater. The Port is presently designing an expansion of the land application system that is projected to meet the projected demands of subscribed users, and also meet the demands projected for Phase 1 of Alternative 2. However, additional expansion of the system beyond the current planned expansion would be required to fully accommodate Phase 1 of Alternative 1 and full build-out of both Alternatives 1 and 2.

Electrical

- GCPUD can accommodate incremental new development with power demand loads that total less than 5 MW. However, new industries moving into the site that have power demands in excess of 5 MWs would be required to enter into a “Facility Cost Contribution” arrangement with GCPUD, the proceeds of which are used to expand the electrical distribution system infrastructure to the extent required to serve the industry contributor. GCPUD has indicated that a new substation would have the capacity to serve an approximately 78 MW electrical load, which is large enough to accommodate build-out under Alternatives 1 and 2.

Chapter 2

PROJECT DESCRIPTION AS PRESENTED IN THE DRAFT EIS

CHAPTER 2
DESCRIPTION OF PROPOSED ACTION(S) AND ALTERNATIVES

This chapter of the Final EIS presents the "Description of Proposed Action(s) and Alternatives" prepared for the Draft Environmental Impact Statement (DEIS). This chapter describes the Proposed Action(s) and Alternatives for the *Grant County International Airport (GCIA) Employment Center* project. **Chapter 1** of this document summarizes the findings of the DEIS and **Chapter 3** provides a detailed presentation of the affected environment and significant environmental impacts of the Proposed Action(s) and Alternatives.

2.1 INTRODUCTION

The Port of Moses Lake (Port) is proposing an employment center on an approximately 1,258-acre site comprised of properties located in the Port, the City of Moses Lake (City) and Grant County (County). The proposed *GCIA Employment Center* is intended to strengthen the existing aerospace and manufacturing cluster at and near the GCIA.

2.2 BACKGROUND

The County, together with the Port and City, applied to the Washington Department of Commerce (Commerce) for an Advanced Planning Grant to fund preparation of a Planned Action EIS for the *GCIA Employment Center* project. A Planned Action EIS provides detailed, comprehensive environmental analysis of a project upfront during the planning stage of the overall project, thereby streamlining future permitting for individual projects. On January 26, 2015, Commerce Department awarded the grant to the County/Port/City to prepare the Planned Action EIS for the *GCIA Employment Center*.

2.3 ENVIRONMENTAL REVIEW PROCESS AND PURPOSE

SEPA EIS and Lead Agency

The State Environmental Policy Act (SEPA) provides the framework for agencies to consider the environmental consequences of a proposal before taking action. It also gives agencies the ability to condition or deny a proposal due to identified likely significant adverse impacts. SEPA is implemented through the SEPA Rules, Chapter 197-11 WAC.

The lead agency is the agency responsible for all procedural aspects of SEPA compliance (e.g., preparation of an EIS). The responsible official represents the lead agency and is responsible for the documentation and content of the environmental analysis.

For purposes of the proposed *GCIA Employment Center* project, Grant County and Port of Moses Lake are serving as the SEPA co-lead agencies. Grant County is the nominal SEPA lead, and the Grant County Planning Director is acting as the responsible official for the SEPA review. The City of Moses Lake will provide important input to the SEPA process.

For purposes of the cleanup/remediation plans and actions to address soil and groundwater contamination on portions of the *GCIA Employment Center* site and surrounding area, the U.S. Environmental Protection Agency (EPA) is the responsible entity, and will conduct separate SEPA review (see Section 3.4, **Environmental Health**, for details).

Planned Action Designation

The Port of Moses Lake, Grant County and City of Moses Lake are proposing that future development of the *GCIA Employment Center* site be designated by the County and City as a Planned Action, pursuant to SEPA (WAC 197-11-168(C)). The Planned Action designation would reflect a decision that adequate environmental review addressing the probable significant adverse environmental impacts of the Proposed Action(s) has been completed at this stage of the planning process, and that further environmental review under SEPA would not be necessary if it is determined that future development applications are consistent with the conceptual land use map and EIS alternatives which served as the basis for this EIS and the Planned Action designation.

According to WAC 197-11-164 (under RCW 43.21C.031), a Planned Action is defined as a project that is:

- Designated as a Planned Action by ordinance or resolution;
- Has had the significant environmental impacts addressed in an EIS prepared in conjunction with a subarea plan, master planned development or phased project;
- Is located within an urban growth area; and,
- Is consistent with an adopted comprehensive plan.

Consistent with WAC 197-11-164, the Proposed Action(s) includes designation of the *GCIA Employment Center* development as a Planned Action; probable significant environmental impacts are addressed in this EIS that is associated with a phased project; the site is located in an urban growth area; and, the proposed development of the site would be consistent with the County's Comprehensive Plan (2006, as amended) and City's Comprehensive Plans (2001, as amended) (see Section 3.7, **Land Use/Relationship to Plans and Policies** for further information). Designating projects as Planned Actions shifts environmental review of a project from the time a specific permit application is made to an earlier phase in the planning process.

The basic steps in designating Planned Action projects are to: 1) prepare an EIS; 2) designate the project as a Planned Action by adoption of an ordinance or resolution; and, 3) review future permit applications for development relative to their consistency with the conceptual land use map and EIS alternatives that served as the basis for the EIS and the Planned Action designation.

When specific development permit applications are submitted to the County and City in the future, determinations would be made as to whether the proposed development is consistent with the conceptual land use map and assumptions that served as the basis for this EIS and the Planned Action designation. If not, additional environmental review may be required under SEPA. If so, then further environmental review would not be required under SEPA to support construction and build-out on the site.

Determination of Significance and EIS Scoping

Grant County and Port of Moses Lake have determined that this proposal is likely to have a significant impact on the environment. An EIS is required under RCW 43.21C.030 (2)(c) and has been prepared to evaluate probable significant impacts and identify appropriate mitigation measures. On February 13, 2015, the County issued a Determination of Significance (DS)/Request for Comments on the Scope of the EIS for the *GCIA Employment Center* proposal. The purpose of scoping under SEPA is to invite public comment on the scope of EIS alternatives and elements of the environment to be addressed in the EIS. The County and Port also held a public scoping meeting on February 25, 2015, to invite verbal comments on the DS. The County and Port reviewed comments received during the 21-day scoping period, which extended from February 13 to March 3, 2015.

A total of three comment letters were received; no one offered official comments at the public scoping meeting. Written comments were received from the following parties: 1) Washington State Department of Archaeology and Historic Preservation (DAHP), 2) Washington State Department of Fish and Wildlife (WDFW) and 3) the Confederated Tribes of the Colville Reservation.

Below is a summary of the key issues identified during the scoping process, relative to the scope of the EIS, followed by references to the party(s) who made the comment and where the comments are addressed in this DEIS.

- Historic and Cultural Resources should be an element of the EIS. A cultural resources survey should be conducted by a professional archaeologist and the results incorporated into the document (*DAHP*; see Section 3.9, **Historic and Cultural Resources**).

- WDFW's Priority Habitat and Species Map indicates the occurrence of several burrowing owls onsite. It is recommend that surveys be conducted over the entire site where permanent ground disturbing activities are not presently occurring to ascertain burrowing owl presence/absence, as well as burrow sites or potential burrow sites (*WDFW*; see Section 3.3, **Plants and Animals**).

- A cultural resource report should be completed and forwarded to the Confederated Tribes of the Colville Reservation for review (Confederated Tribes of the Colville Reservation; see Section 3.9, **Historic and Cultural Resources**).

Elements of the Environment

Following scoping, the lead agencies identified the elements of the environment listed below to be evaluated in the EIS:

- Earth
- Water Resources
- Plants and Animals
- Environmental Health
- Air Quality and Greenhouse Gases (GHGs)
- Noise
- Land Use/Relationship to Plans and Policies
- Aesthetics/Light and Glare
- Historic and Cultural Resources
- Transportation
- Public Services (Police, Fire/Emergency Services)
- Utilities (Sewer, Water)

EIS Alternatives

Following scoping, the lead agencies identified three EIS alternatives to be analyzed in the EIS: **two Action Alternatives** and a N**o Action Alternative**. The Action Alternatives will feature a range of building densities and uses, focusing on aerospace and manufacturing uses. The alternatives listed below will be evaluated in the EIS:

- **Alternative 1** – Heavy Manufacturing/Warehouse Emphasis
- **Alternative 2** – Light Manufacturing/Technology Emphasis
- **Alternative 3** – No Action Alternative

Purpose of EIS Analysis

Per WAC 197-11-400, an EIS is an objective, impartial evaluation of the environmental consequences of a proposed project. It is a tool that will be used by Grant County, Port of Moses Lake, City of Moses Lake, other agencies and the public in the decision-making process for the *GCIA Employment Center* project. An EIS does not recommend for or against a particular course of action.

This DEIS for the *GCIA Employment Center* project is Grant County's and Port of Moses Lake's analysis of probable significant environmental impacts of the Proposed Actions and alternatives on the elements of the environment listed above. The DEIS has been issued and distributed to agencies, tribes, organizations and the public for review as part of a public comment period. Comments on the DEIS can be given in writing at any time during the 30-day comment period.

Based on the comments received on the DEIS, a Final EIS (FEIS) will be prepared as the final step in the EIS process. The FEIS will provide responses to comments received on the DEIS from agencies, organizations and the public, and may contain clarifications to the analysis of environmental impacts. The DEIS and FEIS together will comprise the document that the County, Port and City will use – along with other analyses and public input – to make decisions on the proposed *GCIA Employment Center.*

After the FEIS is issued, County, Port and City staff will make recommendations to the decision-makers on the *GCIA Employment Center* project. Ongoing opportunities for public input will occur during the process.

This DEIS has been prepared for the proposed *GCIA Employment Center* based on information that is currently available and that has been prepared for this DEIS.

Prior Environmental Review

SEPA environmental review has been accomplished for a prior action related to the *GCIA Employment Center* project. This document is incorporated by reference into this EIS, per WAC 197-11-635:

- *Grant County Comprehensive Plan and EIS* (2006)

Other Related Environmental Review

Groundwater and soil contamination is present beneath portions of the *GCIA Employment Center* site and site vicinity from past operations of the former Larson Air Force Base (AFB), industrial activities associated with the aircraft industry and target range activities connected with a former Gun Club. Cleanup and remediation of the contaminated areas that meet established cleanup/remediation levels is required under federal and state law.

The U.S. Environmental Protection Agency (EPA) has assumed the role of lead agency for cleanup/remediation of portions of the *GCIA Employment Center* site and vicinity, and in 1992, the Moses Lake Wellfield Contamination Superfund[1] Site was added to the EPA's National Priorities List. The contaminated areas will undergo cleanup/remediation under EPA's oversight pursuant to a final remediation plan defined by EPA. As part of this ongoing process, applicable cleanup methods will consider potential development plans for the site. Certain activities related to development, such as grading, stormwater control, utility/building construction, public access, etc., would be conducted in accordance with institutional controls defined by EPA in the final remediation plans (see Section 3.4, **Environmental Health**, for details).

[1] Superfund is the name given to the federal environmental program established to address sites requiring cleanup under Federal law. It is also the name of the fund established by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, that can be used by EPA to perform site cleanup work. The Superfund program allows the EPA to compel responsible parties to perform cleanups or to perform cleanups itself and then seek reimbursement from responsible parties for EPA's cleanup costs.

A City-owned parcel in the eastern portion of the site was formerly a Gun Club with a target range. Contaminants from ammunition associated with these past activities are likely present in the soils and potentially groundwater beneath the parcel and surrounding areas. Further study and possibly cleanup/remediation would be required for development of this parcel.

This DEIS briefly summarizes the history of the site and the site's current environmental health-related conditions. It refers to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and its regulatory requirements for the former Larson AFB; and, discusses protocols and institutional controls that will ultimately set out requirements and compliance methods for construction and long-term development of portions of the *GCIA Employment Center* site and site vicinity. The DEIS also discusses the further study and possible cleanup/remediation that would be necessary at and near the former Gun Club. The impact analysis in this DEIS assumes an existing/baseline condition subsequent to phased cleanup/remediation (that is, the condition of the site after remediation has been accomplished). Therefore, only the probable significant environmental impacts and applicable mitigation measures related to development of the site are addressed in this DEIS. Potential impacts associated with cleanup/remediation activities will be addressed through separate processes (e.g., by the EPA in the case of the Moses Lake Wellfield Contamination Superfund site; see Section 3.4, **Environmental Health**, for details).

2.4 LOCATION

The *GCIA Employment Center* site is located on and adjacent to the Port of Moses Lake. The site is situated in Grant County and City of Moses Lake, and the east edge of the Port property (see **Figure 2-1** for a vicinity map and **Figure 2-2** for a site map).

2.5 SITE HISTORY AND DESCRIPTION

Site History

In 1942, the federal government opened the Moses Lake Army Air Base on approximately 10,000 acres of land, including the *GCIA Employment Center* site. The base was used for training P-38 pilots and later B-17 Flying Fortress crews. After World War II ended in 1945, the base briefly closed, but in 1948 was reopened as a U.S. Air Force Base. In 1950, the facility was renamed Larson Air Force Base (AFB). Larson AFB continued to grow through the 1950s adding a troop carrier wing and an air transportation operation. The base became a test flight center for the Boeing Company. Base activities from the 1940s through the 1960s were generally associated with aircraft and military operations, including fueling,

Grant County International Airport Employment Center
Draft EIS

Source: EA, Esri, OpenStreetMap, 2015.

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Figure 2-1
Regional Map

Grant County International Airport Employment Center
Draft EIS

Source: EA, Esri, and OpenStreetMap, 2015.

0 0.75 1.5 3 4.5 Miles

EA Engineering, Science, and Technology, Inc., PBC

Figure 2-2
Vicinity Map

wastewater treatment and disposal, weapons storage and training exercises. In 1964, it was announced that the Air Force would be closing the base in 1966. In 1965, the Grant County commissioners established the Grant County Port District No. 10 -- the Port of Moses Lake -- and the Larson AFB was renamed "The Grant County International Airport". The airport continued to be a major flight crew training facility for Japan Airlines and other airlines worldwide, and a flight testing facility for the Boeing Company and other airframe manufacturers. The remaining portions of the base were either sold to the Boeing Company or other private individuals, or deeded to other governmental agencies, including Big Bend Community College, Colombia Basin Job Corp and other county and city agencies. A number of aerospace and industrial operations have more recently located in proximity to the airport (see section 3.9, **Historic and Cultural Resources**, and **Appendix H** for details).

Site Description

The approximately 1,258-acre *GCIA Employment Center* site is comprised of 34 parcels (see **Figure 2-3** for a Site Parcel Map). Currently, the site is largely vacant and undeveloped. Nine buildings totaling approximately 342,175 sq. ft. occupy the site (see **Table 2-1** and **Figure 2-4**). A total of up to six employees currently work at the site on a permanent basis, and an additional three employees work at the site on a seasonal basis.

Table 2-1
ON-SITE BUILDINGS – EXISTING CONDITIONS

Owner	Building Number	Building Area (Sq. Ft.)
Boeing Company	5801	170,000
Boeing Company	5802	83,000
Boeing Company	5803	3,000
Port of Moses Lake	4006	41,000
USDA Forest Service	N/A	10,000 (est.)
ASPI Group	5106	19,000
City of Moses Lake	N/A	3,435
North American Free Trade Zone Industrial LLC	N/A	3,540
ASA Development Group	N/A	9,200
		TOTAL 342,175

Source: Port of Moses Lake, 2015.

The site is located in areas of unincorporated Grant County, City of Moses Lake and Port of Moses Lake. The portions of the site in Grant County are zoned as Grant County International Airport and Urban Heavy Industrial. The portions of the site in City of Moses Lake are zoned as Heavy Industrial and Public Facilities. The Port of Moses Lake is in the process of updating their Airport Master Plan. The parts of the site located in the Port are designated as Airfield Operations, Aviation Development and Revenue Support/Aviation Development in the *Draft Airport Master Plan* (see Section 3.7, **Land Use/Relationship to Plans and Policies**, for further description of the site's zoning/land use designations).

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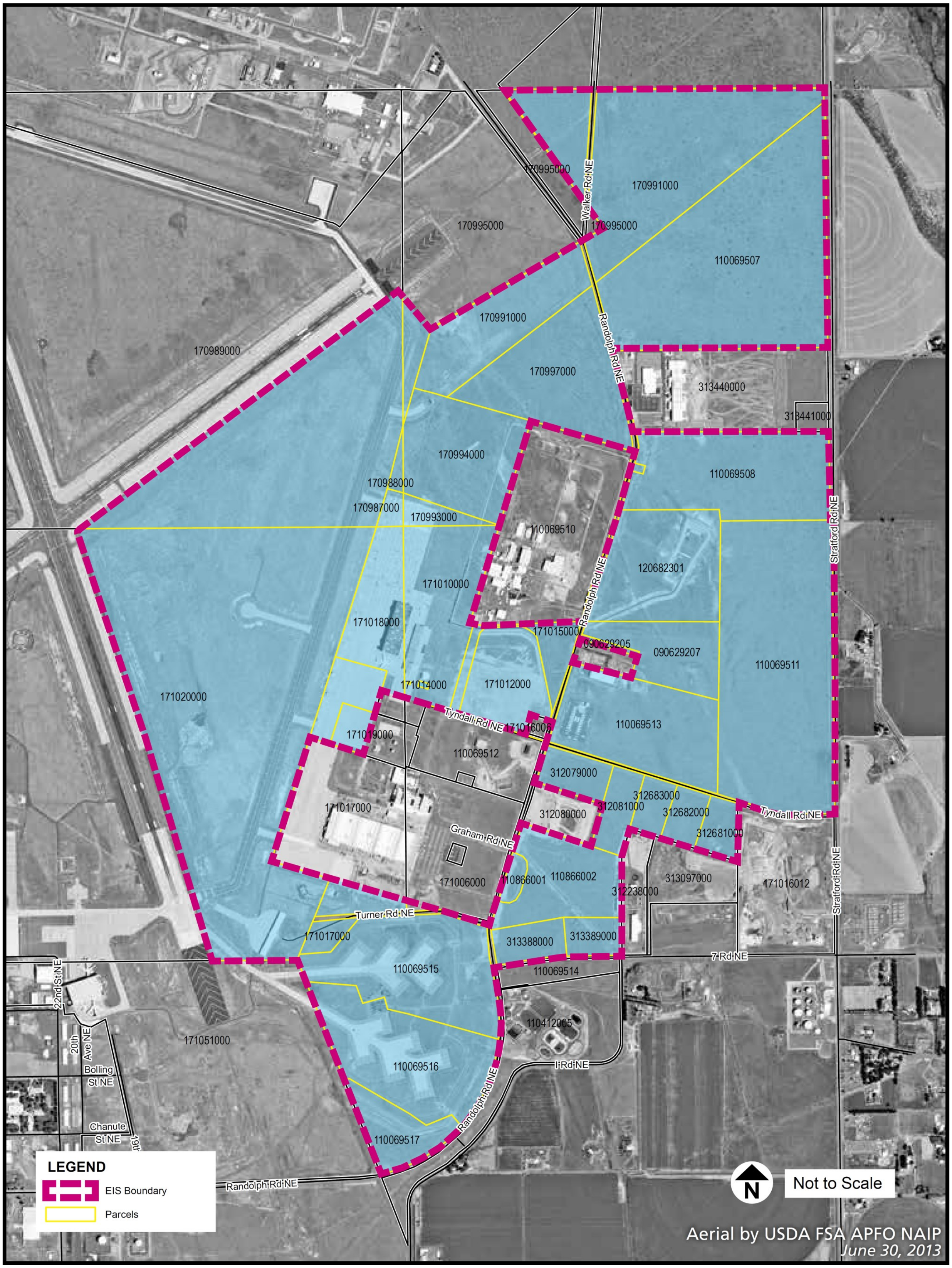
Draft EIS



Source: Reid Middleton, 2015.

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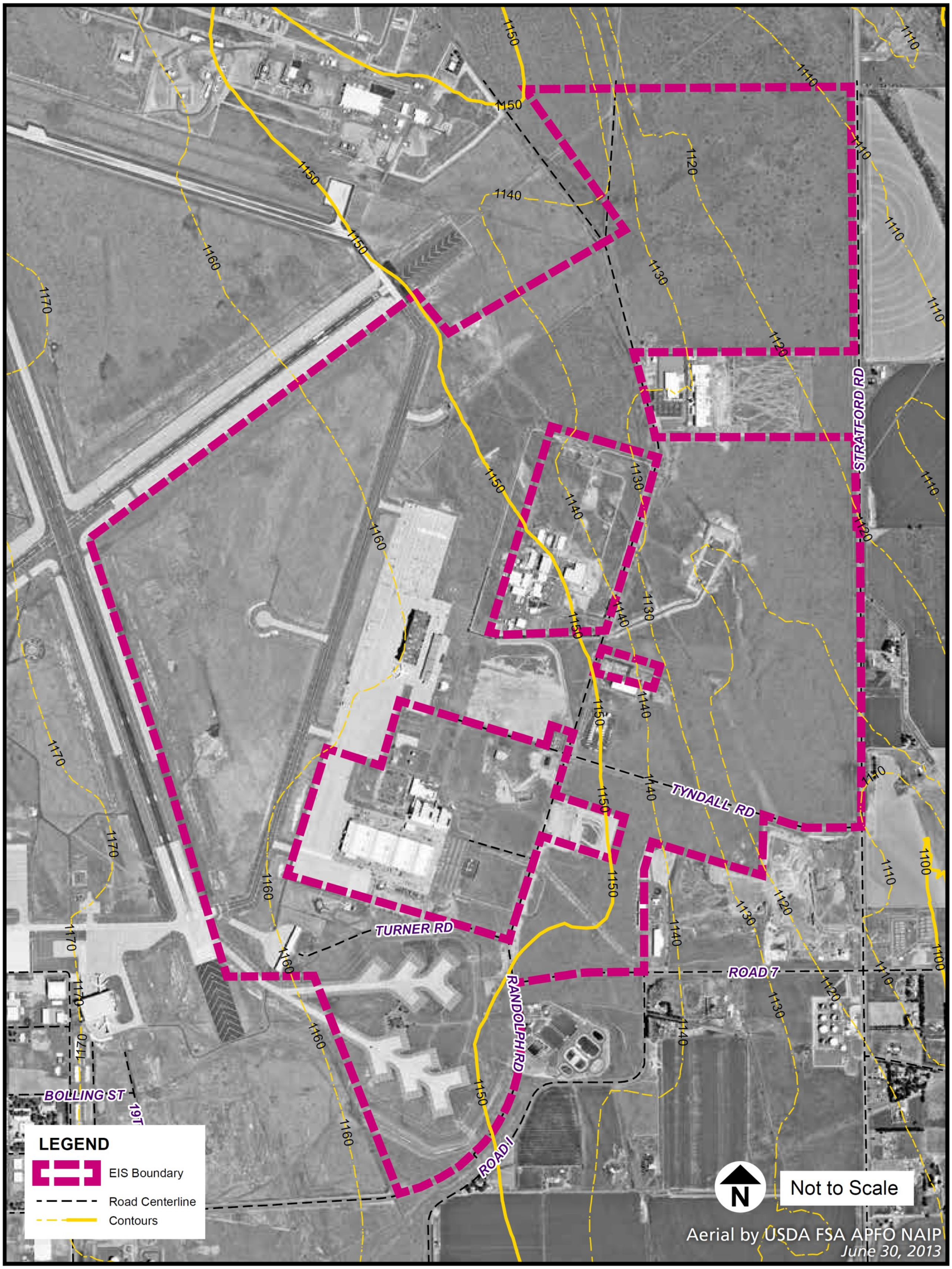
Figure 2-3
Existing Site Parcel Map

Grant County International Airport Employment Center
Draft EIS



Source: Reid Middleton, 2015.

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Figure 2-4

Existing Site Conditions

Approximately 141 acres of the site (11 percent) are presently in impervious surface areas including: buildings, loading areas, parking lots, roads, sidewalks and airport taxiways. The remaining approximately 1,117 acres of the site (approximately 89 percent) is in natural open space and landscaping.

The topography of the site is flat to gently rolling with slopes that range from 0 to 6 percent. No wetlands or streams are located on the site; the closest water body to the site is Crab Creek, located approximately ½ mile from the site to the east. Vegetation on the site is sparse, and includes native sage brush, bunch grasses and common yarrow (see Section 3.1, **Earth**, Section 3.2, **Water Resources**, Section 3.3, **Plants and Animals**, and **Appendices A** and **B** for further information).

Vehicular access to the site is currently provided by two north/south roadways (Stratford Road NE [Road J NE] and Randolph Road NE [Walker Road NE]), and three east/west roadways (Tyndall Road NE, Road 7 NE and Turner Road NE) (see Section 3.10, **Transportation**, and **Appendix C** for further description of these roadways).

The following utilities are currently available to the site:

- **Sewer** – City of Moses Lake
- **Potable Water** – City of Moses Lake
- **Industrial Wastewater** – Port of Moses Lake
- **Natural Gas** – Cascade Natural Gas Corporation
- **Electricity** – Grant County Public Utility District (GCPUD)
- **Communications (Telephone and Internet)** – several communications providers serve Moses Lake and the site vicinity, including Century Link.

(See Section 3.12, **Utilities**, and **Appendix D** for further description of these utilities.)

2.6 APPLICANT'S OBJECTIVES

The applicant's (the Port of Moses Lake's), as well as Grant County's and City of Moses Lake's, objectives for the *GCIA Employment Center* are to:

- Enhance Grant County's, Port of Moses Lake's and City of Moses Lake's and the region's economic vitality by building upon an existing aviation, manufacturing and technology hub that takes advantage of its location at an international airport;
- Create new sources of long-term revenue that can be used for the aerospace and advanced manufacturing-related objectives of the County, Port and City;
- Strengthen the Pacific Northwest's links to the global community by creating further opportunities for aerospace and manufacturing;

- Identify and pursue a market-driven level and range of uses that will attract desired tenants and associated employment growth, while remaining compatible with an airport environment;
- Formulate a long-term plan for the site that seeks to capitalize on it development potential within the context of existing regulatory requirements, provides for a cost-effective infrastructure system, and allows for flexibility to respond to market factors;
- Respect the site's location within the surrounding communities, including ensuring compatibility with area uses and transportation systems and creating necessary on-site road and utility networks;
- Provide a clear, expedited and predictable environmental permitting and development process;
- Ensure the development is compatible with environmental remediation efforts;
- Encourage sustainable and "green" development practices as part of future building and infrastructure design and construction at the site; and
- Engage public and private stakeholders to invest in the *GCIA Employment Center*'s development and success.

2.7 PROPOSED ACTION(S)

The County and Port – with input from the City – are analyzing future development opportunities for the *GCIA Employment Center* site. This SEPA EIS evaluates development alternatives that encompass a range of land use intensities and uses that the site could potentially accommodate in the future. A description of the alternatives that the EIS evaluates follows the description of the Proposed Action(s) below.

The Proposed Action(s) for the site are:

- **Adoption of Planned Action Ordinances** by the County and City (see the discussion of Planned Actions above); and
- **Future permitting and construction of infrastructure, buildings and other improvements** over the build-out horizon (assumed to be by 2035 for the EIS analysis).

Other possible future actions related to the project could include:

- **Future approval of a Master Plan** for the site by the County, Port and City, to be based on a plan that has been agreed to by these parties and the other property owners at the site; and,
- **Future execution of a Development Agreement** between the County, Port, City and other property owners at the site.

2.8 DESCRIPTION OF EIS ALTERNATIVES

A definitive plan for long-term development of the site cannot be formulated at this stage, as specific projects and users have not been and cannot reasonably be identified for the assumed 20-year development build-out. Specific building footprints, sizes and designs, and specific locations of uses also cannot be defined. In order to conduct a comprehensive environmental review, two Action Alternatives and a No Action Alternative have been conceptually developed for this EIS. Alternatives 1 and 2 would meet the Port's, County's and City's goal to strengthen the existing aerospace and manufacturing cluster at and near the airport; these two alternatives would have somewhat different emphasis, as indicated below.

- **Alternative 1** – Heavy Manufacturing/Warehouse Emphasis
- **Alternative 2** – Light Manufacturing/Technology Emphasis
- **Alternative 3** – No Action Alternative

The two Action alternatives (Alternatives 1 and 2) bracket a range of land use intensities and uses that the site could accommodate, given the following conditions:

- No zoning reclassifications, comprehensive plan amendments or other major land use changes would be required;

- Potential land uses would be those allowed by the existing County and City zoning and Draft Port of Moses Lake Airport Master Plan land use designations (e.g., no conditional uses are assumed);

- Potential land uses would represent uses that could realistically be expected to develop on the site given the site's unique setting (in an Urban Growth Area, adjacent to and encompassing a portion of an international airport) and the Port/County/City's goal to create an employment center focused on aerospace and manufacturing; and

- The assumed emphasis areas and potential uses under the two alternatives (i.e., heavy manufacturing/warehouse under Alternative 1 and light manufacturing/technology under Alternative 2) could each result in significant impacts on certain key elements of the environment (e.g., on transportation [truck traffic], utilities [sewer and water], air quality and noise under Alternative 1; and on transportation [single-occupancy vehicle traffic] under Alternative 2).

The Action Alternatives represent an overall envelope of potential development for analysis in the EIS; however, neither should be considered a final development concept for the *GCIA Employment Center* site. These alternatives are assumed to include similar infrastructure, utility and roadway networks. For purposes of environmental review, a number of assumptions have been developed for the two alternatives, including:

- Mix of uses and areas the uses would occupy;
- Employees
- Impervious/pervious surface area;
- Grading quantities; and
- Parking.

These assumptions essentially create development alternatives without having actual building plans, and allow the analysis of environmental impacts. A different mix of land uses, within the overall range of the development alternatives, could be proposed by developers and considered by the Port, County and City. However, it is assumed that the maximum amount of development represented by Alternatives 1 and 2 would not be exceeded without the need for further SEPA review.

Table 2-2 provides a summary comparison of the EIS Alternatives. **Table 2-3** shows the types of potential allowed land uses that could develop onsite under the EIS Alternatives (see **Appendix E** for details on the assumptions upon which the EIS Alternatives are based). **Figure 2-5** depicts the conceptual land use map under Alternatives 1 and 2.

Alternative 1 – Heavy Manufacturing / Warehouse Emphasis

Alternative 1 represents development of the *GCIA Employment Center* site with an emphasis on heavy manufacturing and warehouse uses. A roughly 70:30 mix of these two industrial uses is assumed. Under this alternative, a total of up to approximately 8.8 million sq. ft. of new building area would be developed onsite over the approximately 20-year build-out period (approximately 6.3 million sq. ft. of new heavy manufacturing/ warehouse building area and approximately 2.5 million sq. ft. of new aviation development/revenue support building area). The heavy manufacturing/warehouse uses would primarily be located in the eastern and central portions of the site; the aviation development/revenue support uses would primarily be located in the western portion of the site (adjacent to and including a portion of the Grant County International Airport). The new building area onsite would provide capacity for a total of approximately 13,520 new employees. Roadway and utility infrastructure (i.e., stormwater, water and sewer) would be provided to support the uses proposed under Alternative 1. Two primary access points to the site are assumed to/from Stratford Road NE and Randolph Road NE (see **Figure 2-5** for the conceptual land use map of Alternative 1).

Table 2-2
EIS ALTERNATIVES OVERVIEW

Features	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis	Alternative 2 Light Manufacturing/ Technology Emphasis	Alternative 3 No Action Alternative
Site Area (acres)			
Port-owned Properties	485	485	485
City-owned Properties	47	47	47
Privately-owned Properties	726	726	726
TOTAL	1,258	1,258	1,258
Changes to Existing Zoning	No	No	No
New Building Area (sq. ft.)			
Aviation Development	2,245,460	2,245,460	
Revenue Support	274,494	548,897	
Heavy Industrial	6,289,693	7,290,967	
TOTAL	8,809,647	10,085,324	0
New Employees (jobs)			
Aviation Development & Revenue Support	2,994	2,994	
Heavy Industrial	10,585	16,016	
TOTAL	13,519	19,010	0
Total Impervious Surface Area (acres)	1,084	1,007	0
Total Cut/Fill (cubic yards)	2,731,640	2,731,640	0
Recommended Parking (stalls)	5,602	14,640	0
Planned Action Ordinance	Yes	Yes	No

***Source: Reid Middleton, 2015*.**

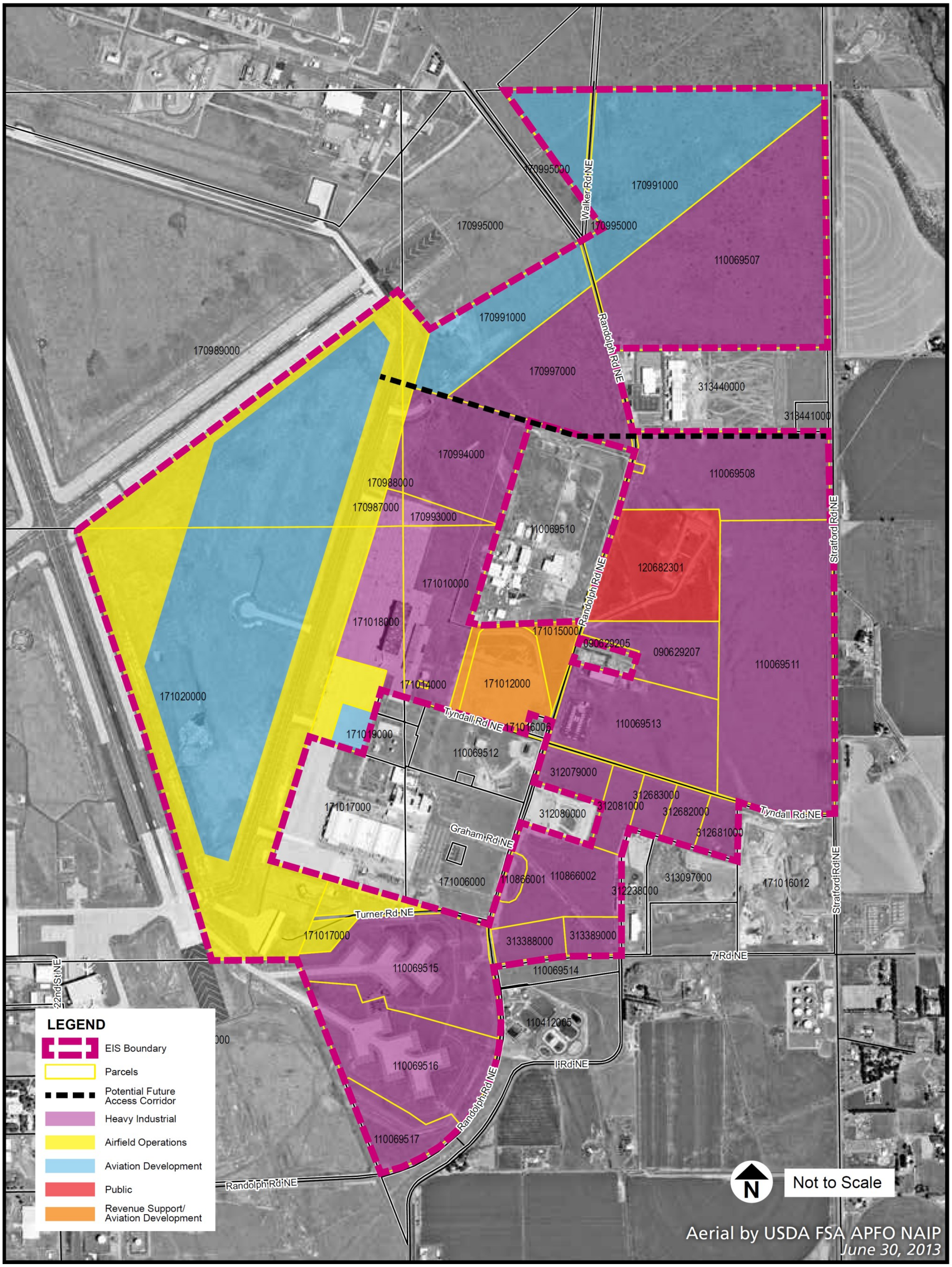
Note: See **Appendix E** for the assumptions upon which **Table 2-2** is based.

Table 2-3
TYPES OF POTENTIAL ALLOWED USES – ALTERNATIVES 1, 2 & 3

Land Use Areas	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis	Alternative 2 Light Manufacturing/ Technology Emphasis	Alternative 3 No Action Alternative
Airport Operations	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions
Aviation Development	• Fixed base operators • Specialized aviation service operations • Aircraft maintenance • Retail fueling services • Warehouse (aircraft hangars)	• Fixed base operators • Specialized aviation service operations • Aircraft equipment sales/rentals • Vocational schools (flight training)	• Continuation of existing conditions
Revenue Support	• Facilities for manufacturing, processing &/or assembly of products • Warehouses	• Airport-related facilities • Research facilities, testing laboratories • Vocational schools	• Continuation of existing conditions
Heavy Industrial	• Machine shop • Welding or metal fabrication • Heavy industrial; manufacturing, processing or packaging • Heavy construction equipment storage, sales & rental • Warehousing and distribution facilities • Bulk fuel storage • Transportation services (e.g., freight consolidation)	• Light industrial • Light manufacturing • Technological uses (e.g., laboratories)	• Continuation of existing conditions
Public Facilities	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions

Source: Grant County Municipal Code, City of Moses Lake Municipal Code, Port of Moses Lake Draft Final Airport Master Plan, June 2014.

Grant County International Airport Employment Center
Draft EIS



Source: Reid Middleton, 2015.

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Figure 2-5

Conceptual Land Use Map—Alternatives 1 and 2

Alternative 2 – Light Manufacturing / Technology Emphasis

Alternative 2 represents development of the *GCIA Employment Center* site with an emphasis on light manufacturing and technology uses. A roughly 70:30 mix of these two industrial uses is assumed. Under this alternative, a total of up to approximately 10.1 million sq. ft. of new building area would be developed onsite over the approximately 20-year build-out period (approximately 7.3 million sq. ft. of new light manufacturing/ technology building area and approximately 2.8 million sq. ft. of new aviation development/revenue support building area). The light manufacturing/technology uses would primarily be located in the eastern and central portions of the site; the aviation development/revenue support uses would primarily be located in the western portion of the site (adjacent to and including a portion of the Grant County International Airport). The new building area onsite would provide capacity for a total of approximately 19,010 new employees. Roadway and utility infrastructure (i.e., stormwater, water and sewer) would be provided to support the uses proposed under Alternative 2. Two primary access points to the site are assumed to/from Stratford Road NE and Randolph Road NE (see **Figure 2-4** for the conceptual land use map of Alternative2).

Specific features of the development assumed under the two alternatives are further described below. Where there are distinctions between Alternatives 1 and 2, they are so noted. Otherwise, the information is assumed to pertain to both alternatives.

Construction Schedule/Development Phasing

There is presently no Master Plan or Phasing Plan for development of the proposed *GCIA Employment Center* project. However, given the size of the project, it is likely that it would be developed in phases. For purposes of this EIS, development of the site is assumed to commence in 2016, with build-out by 2035 (the actual dates that development would commence and build-out would be subject to market conditions). This EIS analyzes full build-out of the project. However, to provide possible benchmarks for development of the project, **Table 2-4** shows potential Phasing Plans for Alternatives 1 and 2, assuming that development would be distributed evenly over the assumed 20-year build-out period. Based on this assumption, proposed development could result in approximately 440,485 sq. ft. of new building area with 675 new employees each year over the build-out period under Alternative 1, and approximately 504,265 sq. ft. of new building area with 950 new employees each year over the build-out period under Alternative 2.

Table 2-4
POTENTIAL PHASING PLAN – ALTERNATIVES 1 & 2

Potential Development Phase	Potential Completion Year	Alternative 1		Alternative 2	
		New Bldgs (Sq.Ft.)	New Employees	New Bldgs (Sq.Ft.)	New Employees
I	2020	2,202,400	3,380	2,521,330	4,755
II	2025	4,404,800	6,760	5,042,660	9,505
III	2030	6,607,200	10,140	7,563,990	14,260
IV	2035	8,809,650	13,520	10,085,320	19,010

Source: EA Engineering, Science, and Technology, Inc. PBC, 2015.

Overall site preparation, including installation of temporary erosion control measures and general clearing and grading operations, is assumed to commence at the outset of site development, potentially occurring in 2016. Site preparation would likely occur through a phased earthwork program (see the **Grading** section below for an estimate of the total amount of earthwork that would be required). Phasing of specific infrastructure/ building development would depend on market conditions and on the Port's and future developer's assessment of how site infrastructure can be built out most efficiently.

As mentioned previously, the portions of the site in the Moses Lake Wellfield Contamination Superfund Site will undergo cleanup/remediation under the oversight of EPA. Certain activities related to development, such as grading, stormwater control, utility/building construction, public access, etc., will be dictated by EPA in coordination with the Port of Moses Lake, Grant County, City of Moses Lake and other agencies

Access, Circulation & Parking

Primary access to the site would continue to be provided from the south via Stratford Road NE and Randolph Road NE with proposed development under Alternatives 1 and 2. East-west connections through the site would continue to be provided by Tyndall Road NE, Road 7 NE and Turner Road NE as well. Development of a new east-west road could be provided in the northern portion of the site to access otherwise land-locked parcels (see **Figure 2-5**). Several smaller access roads/driveways would branch off from the main north-south and east-west roadways to provide access to individual buildings with proposed development of the *GCIA Employment Center*. The locations of these smaller roads/driveways and the determination of which would be public/private would be made when development plans are submitted for individual properties or as part of a Master Plan process for the entire site. All roadways and roadway improvements would be designed and constructed in accordance with applicable County, City and Port road standards. Pedestrian facilities would be constructed on at least one side of new roads developed for the project. The optimal location for new crosswalks at intersections would be assessed during the design of those improvements.

Parking

Under Alternatives 1 and 2, it is assumed that parking areas would be constructed in phases as site build-out proceeds. Recommendations for the total amount of parking to support development of the site were prepared for purposes of this EIS analysis. Based on these calculations, a total of approximately 5,600 new parking stalls are recommended for site development under Alternatives 1, and a total of approximately 14,640 new parking stalls are recommended for development under Alternative 2. The total amount of parking recommended for proposed development of the *GCIA Employment Center* was calculated based on guidance from the *Institute of Transportation Engineers (ITE) Manual, 4th Edition* (see **Appendix E** for details). The recommended parking differs from Grant County's and City of Moses Lake's parking requirements for the proposed uses, but potentially represents an appropriate amount of parking for the proposed project (see Section 3.10, **Transportation**, and **Appendix C** for a discussion of recommended versus required parking). Proposed parking for the *GCIA Employment Center* would be reviewed and approved by the County, City and/or Port.

Open Space and Landscaping

At build-out under Alternative 1, it is assumed that approximately 174 acres (14 percent) of the site would be in pervious surfaces, including natural areas and newly landscaped areas. At build-out under Alternative 2, it is assumed that approximately 251 acres (20 percent) of the site would be in pervious surfaces, including natural areas and newly landscaped areas. (See **Appendix E** and the *Stormwater* section below for a description of the assumptions that were used to estimate pervious and impervious surfaces with proposed development under Alternatives 1 and 2.). It is assumed that with its emphasis on light industry and technology, Alternative 2 could be developed in more of a business park-type configuration and could feature more landscaping than Alternative 1.

New landscaping would be provided onsite with proposed development that would meet or exceed the Port's, County's and City's landscape requirements. Landscaped areas would primarily be provided along the site boundaries and along major roadways; landscaping provided at the access points from the south could help present an attractive entrance to the *GCIA Employment Center*. Landscaping could also be provided in parking areas and around buildings. Landscaping plans would be developed for individual properties or as part of a Master Plan for the entire site, and would be reviewed and approved by the County, City and/or Port.

Grading

Site preparation for development of the *GCIA Employment Center* would likely be established through a phased earthwork program; specific grading plans would be submitted to the Port of Moses Lake, Grant County and/or City of Moses Lake for review and approval. Clearing and grading activities would be conducted in conformance with the *Washington State Department of Ecology (Ecology) Stormwater Management Manual for Eastern Washington*, or as specified by the County and/or City engineer.

For purposes of this EIS, a grading estimate was prepared to calculate the overall amounts of cut and fill necessary to support full development of the site (this environmental review assumes that the amount of earthwork required for site development would be similar for Alternatives 1 and 2). Based on the preliminary grading estimate, a total of approximately 2.7 million cubic yards of cut and fill would be required for site development under Alternatives 1 and 2. This grading estimate assumes an average cut and fill depth of two feet due to the site's relatively flat to gently rolling topography (see **Appendix E** for details on the grading assumptions). Any excess material excavated from the site would be hauled to an appropriately permitted off-site disposal site (see Section 3.1, **Earth**, for further information on site grading).

Stormwater Management

Currently, approximately 141 acres (or 11 percent) of the site is covered in impervious surface areas. The impervious surface areas under Alternatives 1 and 2 were estimated for this EIS based on impervious surface area coefficients from similar types of development; 91 percent of the heavy manufacturing/warehouse areas, 81 percent of light manufacturing/technology areas and 95 percent of the aviation development/revenue support areas are assumed to be in impervious surfaces). Further breakdown of the impervious surfaces area is not possible at this time as there are is no specific development proposal for the site. Under Alternative 1, approximately 1,084 acres (or 86 percent) of the site would be in impervious surface areas. Under Alternative 2, approximately 1,007 acres (or 80 percent) would be impervious surface areas (see **Appendix E** for details on the assumptions for the pervious/impervious surface estimates).

Temporary and permanent stormwater control systems would be provided for the *GCIA Employment Center*, based on a phased or comprehensive program. Stormwater discharge during construction would be subject to a General National Pollutant Discharge Elimination System (NPDES) permit issued by Washington State Department of Ecology (Ecology). Temporary erosion and sedimentation control and Best Management Practices (BMPs) would be implemented to control stormwater runoff during construction, consistent with the *Ecology Stormwater Management Manual for Eastern Washington* (see Section 3.3, **Water Resources** for details). The permanent stormwater control system(s) for future development at the site would also be developed and constructed in accordance with the *Ecology Stormwater Management Manual for Eastern Washington*. Per the Manual, stormwater would be retained within the site and water quality treatment would be provided for runoff from pollution-generating surfaces (e.g., roads and parking areas) (see Section 3.3, **Water Resources** for details).

If stormwater control pond(s) are used for flow control or water quality treatment, they would be designed in accordance with the Federal Aviation Administration's (FAA) Advisory Circular 150/5200-33A and Port of Moses Lake's landscape standards to ensure that no wildlife or avian habitat is created within the vicinity of the airport. All stormwater pond vegetation and landscape vegetation used onsite would be consistent with applicable FAA regulations.

Utilities

The site currently contains sewer, water, natural gas, electricity and telecommunication lines. Development under Alternatives 1 and 2 would require new on-site infrastructure sized and designed to meet the needs of future tenants. The utility purveyors have adequate capacity to serve certain levels of the *GCIA Employment Center* development. Full build-out of the project would require major upgrades to particular utilities (e.g., sewer and water).

- **Sewer** - service for the *GCIA Employment Center* would continue to be provided by City of Moses Lake. RCW 53.08.04 authorizes the Port of Moses Lake to provide utility services to customers and tenants on its property, and to others if the service is not available to them. Therefore, the Port could provide sewer service to customers and tenants on the Port-owned portions of the *GCIA Employment Center* site.

- **Potable Water** - service for the proposed project would continue to be provided by City of Moses Lake. As mentioned above, RCW 53.08.04 authorizes the Port to provide utility services to customers and tenants on its property, and to others if the service is not available to them. Therefore, the Port could provide water service to customers and tenants on the Port-owned portions of the *GCIA Employment Center* site.

- **Industrial Waste Water** – service for the proposed project would continue to be provided by Port of Moses Lake, or could be provided by City of Moses Lake.

- **Natural Gas** - service for the proposed project would continue to be provided by Cascade Natural Gas.

- **Electricity** - service for the proposed project would continue to be provided by GCPUD.

- **Communications (Telephone and Internet)** – service for the proposed project would continue to be provided by Century Link and a number of other communications providers***.***

See Section 3.12, **Utilities**, and **Appendix D** for further information on utilities.

Alternative 3 – No Action

Under this alternative the site would continue in its present largely vacant, undeveloped condition. No additional aerospace and/or manufacturing development would occur onsite at this time. The existing County, Port and City land use designations and zoning classifications would govern any future development of the site. Retention of the site in its existing condition would not provide the County, Port and City with the opportunity to realize their goals, including strengthening the existing aerospace and manufacturing cluster at and near the airport, and adopting Planned Action Ordinances that would streamline future permitting for individual projects.

2.9 SEPARATE ACTION

The North Columbia Basin Rail (NCBR) project is a separate, related action proposed in the site vicinity by others which could take place independent of the *GCIA Employment Center* Proposed Actions/Alternatives analyzed in this DEIS. Separate environmental review has been prepared for the NCBR project. This project is not analyzed in this EIS and would not be subject to the County's, Port's and City's Planned Action Ordinances for the *GCIA Employment Center* project. Below is a brief description of the NCBR project.

North Columbia Basin Rail (NCBR) Project

The NCBR project is a proposed rail construction project to promote economic development in the Moses Lake area. The purpose of the proposed NCBR project is to provide rail service to lands designated for industrial development in the northern part of the City of Moses Lake (including the *GCIA Employment Center* site) as well as to the south and east of the GCIA; to enhance opportunities for economic development; and to attract new rail-dependent businesses to those areas.

The proposed NCBR project includes the construction of two new rail lines (Segments 1 and 2) and the acquisition and refurbishment of an existing rail segment (Segment 3) to provide rail access to land designated and zoned for industrial use along Wheeler Road (Road 2 NE) and the Grant County International Airport (including the *GCIA Employment Center* site).

The following milestones have been completed on the project:

- **2006** -- WSDOT completed a feasibility study for the project
- **November 2008** -- WSDOT and the federal Surface Transportation Board (STB) completed the Preliminary Environmental Assessment (EA)
- **May 2009** -- WSDOT and the STB completed the Final EA
- **2009** -- The STB authorized construction
- **May 2011** -- Final design for Segment 2 was completed

In 2014, WSDOT applied for Transportation Investment Generating Economic Recovery (TIGER) grant to fund continued planning for construction of the project. Funding for the project is also included in the current State Transportation Funding Package before the State legislature.

2.10 BENEFITS AND DISADVANTAGES OF DEFERRING PROJECT IMPLEMENTATION

Per WAC 197-11-440(c)(vii), the benefits and disadvantages of reserving for some future time the implementation of the proposal, as compared with possible approval at this time, are presented below.

The benefits of deferring project implementation include deferral of:

- Potential impacts of the project on the natural environment, including impacts to ground and surface water resources, and critical habitat; and
- Potential impacts of the project on the man-made environment, including impacts to public services (e.g., police and fire protection), traffic operations and utilities (e.g., water and sewer service).

The disadvantages of deferring project implementation include deferral of:

- The opportunity to provide additional aerospace and manufacturing uses and employment opportunities at and near the GCIA and strengthen the existing aerospace/manufacturing cluster at this location;
- Adopting Planned Action Ordinances by the County and City to streamline future permitting of qualifying projects at the *GCIA Employment Center* site;
- The ability to provide additional sources of revenue for the airport and other property owners; and
- The ability to provide tax revenues to the County and City and other taxing entities generated by the project.

Chapter 3

AFFECTED ENVIRONMENT, SIGNIFICANT IMPACTS, MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS AS PRESENTED IN THE DRAFT EIS

CHAPTER 3
AFFECTED ENVIRONMENT, SIGNIFICANT IMPACTS, MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

This chapter of the Final EIS consists of Chapter 3 – Affected Environment, Significant Impacts, Mitigation Measures and Significant Unavoidable Adverse Impacts as presented in the DEIS, and describes the affected environment, impacts of the alternatives, mitigation measures and any significant unavoidable adverse impacts on the environment that would be anticipated from development of the *Grant County International Airport (GCIA) Employment Center* site under the DEIS alternatives.

The DEIS impacts analyses assume an existing/baseline condition <u>subsequent to phased cleanup/remediation</u> of the site and vicinity under the oversight of the Environmental Protection Agency (EPA) (that is, the condition of the site after remediation has been accomplished). Therefore, only the probable significant environmental impacts and applicable mitigation measures related to development of the site are addressed in this DEIS; potential impacts associated with cleanup/remediation activities will be addressed through the separate EPA process (see Section 3.5, **Environmental Health**, for details).

3.1 EARTH

This section of the DEIS describes the geotechnical conditions on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the EIS alternatives are evaluated and mitigation measures identified. This section is based on the *Geotechnical Report* (May 2015) prepared by Landau Associates (see **Appendix A**).

Methodology

Surficial geologic information on the site and vicinity was obtained from U.S. Geological Survey mapping and descriptions, as well as Grant County and City of Moses Lake critical areas mapping and regulations. Information on soil contamination at the Moses Lake Wellfield Superfund site was based on reporting by the U.S. Environmental Protection Agency (EPA) (see **Appendix A** for details)

3.1.1 Affected Environment

Regulatory Context

The following federal, state and local permits and regulations could apply to development of the *GCIA Employment Center* site:

- 40CFR122 National Pollutant Discharge Elimination System (NPDES) Program (State program);
- Washington State Department of Ecology (Ecology) Construction Stormwater General Permit (State permit); and
- The project site is within the local jurisdiction of Grant County and the City of Moses Lake. Both jurisdictions regulate erosion and sedimentation control (GCC 23.12.08 and MLC 13.035) (Local regulations).

Topography

The site is generally flat, with a slight downward slope from west to east. There is an elevation change of approximately 50 feet from the highest point near the western edge of the site to the lowest point in the east-southeastern portion of the site. No steep slopes are present on site (see **Figure 2-4**).

Subsurface Soil Conditions

Geologic Setting

The project site is located in the central portion of the Columbia Basin physiographic province. This province is topographically characterized by incised rivers, plateaus, and anticlinal ridges. Flood-deposited gravels sitting atop basalt bedrock form the general subsurface profile of the site. Near-surface deposits on and in the vicinity of the site consist of approximately 90 to 100 feet of fluvial gravel. Soil defined as fluvial gravel in this region typically consists of soils ranging in size from boulder and gravel to fine sand that includes generally rounded basalt fragments, but locally contains granitic and metamorphic rock or caliche and Ringold fragments. This unit typically exhibits high to moderate permeability. Within a few inches of the ground surface, a thin soil horizon including plant roots and other organic material is typically present (see **Appendix A** for details).

Geologic Hazards

Geologically hazardous areas are defined based on their potential susceptibility to landsliding, seismic or other geologic events, or because of their past use (e.g., as a landfill). Geologically hazardous areas are identified and defined by Grant County (GCC 24.08, Article VI) and City of Moses Lake (MLC 19.03). Potential geologic hazards at the *GCIA Employment Center* site are described below.

Steep Slope Hazards

Steep slope areas are generally defined as areas that rise at an inclination of 40 percent (2.5H:1V) or more with a vertical change in elevation of at least 10 feet. A U.S. Department of Agriculture (USDA) steep slope hazards map shows that no steep slopes are present on or adjacent to the site.

Landslide Hazards

Generally, landslide hazard areas are defined as:

- Any area with a combination of:
    - Slopes greater than 15 percent;
    - Impermeable soils (typically silt and clay) frequently interbedded with granular soils (predominantly sand and gravel); and/or
    - Springs or groundwater seepage.
- Any area that has shown movement during the Holocene Epoch (from 10,000 years ago to present) or is underlain by mass wastage debris of that epoch.
- Any area subject to instability as a result of rapid stream erosion, stream bank erosion, or undercutting by wave action.
- Any area that shows evidence of, or is at risk from, snow avalanches.
- Any area located on an alluvial fan that is currently subject to, or potentially subject to, inundation by debris flows or deposition of stream-transported sediments.

Grant County's GIS mapping database indicates that the site has a low incidence and susceptibility to landslides.

Seismic Hazards

Seismic hazards areas are generally defined as areas subject to severe risk of earthquake damage as a result of ground shaking, ground rupture, soil liquefaction or tsunamis. Ground shaking can occur large distances from the earthquake source; ground rupture occurs only along the active fault trace; liquefaction requires a certain combination of soil and groundwater conditions at a site; and tsunamis can occur far from a fault rupture or massive landslide in a water body.

Ground Shaking

The entire Pacific Northwest region, including the Moses Lake area in which the site is located, lies within a seismically active area, and moderate levels of ground shaking should be anticipated in the future.

Ground Rupture

The site is located approximately 16 miles north of the easternmost extent of the Frenchman Hills Fault (the closest mapped active earthquake fault). Any future ground rupture that may occur within the Frenchman Hills Fault will likely have no ground rupture impact on the site.

Liquefaction

When shaken by an earthquake, certain loose, generally shallow (less than 80 feet), saturated soil deposits lose strength and temporarily behave as if they were liquid. This phenomenon is known as liquefaction. The project site is not mapped as a potential liquefaction hazard area, and the subsurface conditions indicate that liquefaction is not a significant risk at the site.

Tsunamis

Tsunamis are earthquake-generated waves that occur in open water bodies. There are no waterbodies close to the site that would produce tsunamis that could reach the site.

Erosion Hazards

Erosion hazard areas are generally defined as areas that contain soils that may experience severe to very severe erosion from construction activity. The susceptibility to erosion is generally a function of soil type, topography, occurrence of groundwater seepage or surface runoff and the built environment.

According to the USDA Erosion Hazards map, a small portion of the west side of the site is considered a severe erosion hazard. However, erosion can be adequately managed or prevented entirely by proper construction practices and by properly designed and maintained drainage and erosion control measures.

Settlement Hazards

The project site and adjacent areas are not known to be underlain by loose/soft compressible deposits that could be subject to significant amounts of settlement due to loads imposed by heavy buildings or placement of fill materials as part of site regrading or retaining wall construction.

Other Hazards

No coal mine areas are mapped on or adjacent to the site. The site is not situated in a flood-prone area or a volcanic hazard area.

Contaminated Soil

Some of the site and surrounding areas include portions of the former Larson Air Force Base. Base operations, including aircraft movements, maintenance, fabrication and related activities by the U.S. Air Force and associated aerospace suppliers created areas of contaminated soil and groundwater. The EPA has designated portions of the former base and surrounding areas as the Moses Lake Wellfield Superfund Site and has been overseeing soil and groundwater cleanup efforts since 1992. Three trichloroethene (TCE) plumes have been identified within the former base boundaries, near the southern portion of the site. In addition, 39 contaminated soil sites have been identified within the former Air Force base; some of these are located immediately adjacent to or could be partially within the site. Soil contaminants identified at these locations include heavy metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), petroleum hydrocarbons, asbestos, perchlorate and discarded military munitions.

A Gun Club was located in the eastern portion of the site on property owned by the City of Moses Lake. This facility was used for target practice by the City of Moses Lake Police Department. Lead is frequently deposited at gun clubs/shooting ranges as spent lead shot (pellets) at clay target shooting ranges and spent lead bullets in soil berms at rifle/pistol shooting ranges; this contaminant is likely present in this portion of the site.

(See Section 3.5, **Environmental Health** for additional information on contaminated soil and groundwater at the site.)

3.1.2 Impacts of the Alternatives

This section analyzes earth-related impacts on and in the vicinity of the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are noted.

Alternatives 1 and 2

Construction

Development of both Alternatives 1 and 2 would result in alteration of topography as a result of clearing and grading across much of the site. Site preparation for development of the *GCIA Employment Center* would likely be established through a phased earthwork program. For purposes of this EIS, a grading estimate was prepared to calculate the overall amounts of cut and fill necessary to support full development of the site. Based on the preliminary grading estimate, a total of approximately 2.7 million cubic yards of cut and fill would be required for site development under Alternatives 1 or 2. This grading estimate assumes an average cut and fill depth of two feet due to the site's relatively flat to gently rolling topography (see **Appendix E** for details on the grading assumptions). Any excess material excavated from the site would be hauled to an appropriately permitted off-site disposal site.

Erosion

On-site soils generally have slight to moderate erosion hazards; with the exception of a small area of soils in the western portion of the site that has a severe erosion hazard. Without mitigation, site grading and construction associated with proposed development under Alternatives 1 and 2 could cause erosion of exposed soil and soil stockpiles, which could potentially result in on-site and off-site transport of sediment. Temporary erosion and sedimentation control (TESC) measures and best management practices (BMPs) would be implemented during construction of future site improvements. As a result, no significant erosion/sedimentation-related impacts are expected.

Construction Excavations

Temporary excavations would be required for the installation of future structures and infrastructure, including new/upgraded underground utilities, roadways, earth retention structures, etc. Without mitigation, these excavations could potentially impact immediately adjacent existing and future structures, utilities and other improvements. Standard construction measures, such as the use of properly designed and installed temporary excavation shoring systems and properly constructed open excavations, would reduce the potential for significant impacts.

Excavation in Contaminated Soils

As mentioned previously, portions of the site in the Moses Lake Wellfield Contamination Superfund Site will undergo cleanup/remediation under the oversight of EPA. Certain activities related to development of the *GCIA Employment Cen*ter, including excavations in these areas, could encounter contaminated soils. Grading activities at the site would be conducted in accordance with institutional controls defined by EPA in the final remediation plans (see Section 3.5, **Environmental Health**, for details)

Placement of Structural Fill

Alternatives 1 and 2 would require site grading and placement of structural fill associated with construction/modification of access roads, installation of utilities, construction of earth retention structures, local raising of site grades, etc. Structural fill and backfill material placed as part of future site improvements should be densely compacted, which could cause ground vibrations in the immediate vicinity of the construction work. However, significant settlement/ground subsidence due to placement of structural fill that could affect existing or future structures (onsite or offsite) in the immediate area of the fill is not expected. Grading operations could be conducted to control the potential for adjacent settlements. As necessary, adjacent structures could be monitored during construction to verify that no adverse settlement occurs.

Foundation Construction

Based on the presence of generally competent soil conditions over most of the site, it is anticipated that foundation support for most structures would likely be provided by conventional spread footings and mat foundations, although drilled shaft foundations could be used for certain locations and/or building types. Foundation construction would typically require temporary excavation shoring, which could result in the potential impacts discussed above for those construction activities.

Conventional Spread and Mat Foundations

Conventional spread footings and mat foundations would use standard construction methods and equipment; significant noise, vibration, or settlement impacts are not expected with either Alternative 1 or 2. Excavated soil would either be reused on site as structural fill (if determined to be suitable for that purpose), or transported off site to an appropriate disposal location. The size and depth of building foundations could vary across the site and would be determined as part of the site-specific design of individual structures. The size and depth of foundations would depend on various factors that include the building loads, elevation of the lowest parking level (if any), and site-specific soil and groundwater conditions.

Drilled Shafts

Foundation support for certain buildings could potentially include drilled shafts. Caving soils, soil heave and large obstructions can affect the construction of drilled shafts. Installation of casings could mitigate caving soils during installation of drilled shaft for deep foundation support of structures. The installation of drilled shafts generally does not produce significant vibrations; however, installation of temporary casings can produce ground vibrations and localized ground settlement around the shaft construction area. Drilled shafts create relatively large volumes of spoils and could require dewatering (see Section 3.3, **Water Resources** and **Appendix A**, for details on possible dewatering). Spoils generated during drilled shaft installation would be disposed of in accordance with applicable local, state, and federal requirements.

Geologic Hazards

Steep Slopes and Landsliding

Site development activities under Alternatives 1 and 2 would not impact steep slopes or increase the potential for landslides, as neither of these hazard areas is present on or in the vicinity of the site.

Ground Shaking

The entire Pacific Northwest region lies within a seismically active area. As such, there is a potential for ground shaking at the site to impact proposed buildings and infrastructure at the site.

Ground Rupture

Future ground rupture could potentially occur along the Frenchman Hills Fault to the south of the site; however, the risk at the site posed by such ground rupture is considered to be very low given that the fault is located 16 miles away and the return period for large earthquakes on the Frenchman Hills Fault that could rupture the ground surface is on the order of thousands of years.

Operation

Following construction, areas with exposed soils would be either developed or revegetated to prevent erosion and sedimentation. With the increase in impervious surface area, an increase in stormwater runoff would be anticipated. If not properly controlled, increased stormwater runoff could increase erosion and sedimentation in off-site drainage features.

To minimize the potential for impacts to surface water resources from increased surface water runoff, a permanent stormwater control system would be provided based on a phased or comprehensive program. The permanent stormwater control system(s) for future development at the site would be developed and constructed in accordance with the *Washington State Department of Ecology (Ecology) Stormwater Management Manual for Eastern Washington* (see Section 3.3, **Water Resources**, for details*)*. With implementation of the permanent stormwater control system, no significant erosion and sedimentation impacts are expected.

Alternative 3

Under the Alternative 3, the No Action Alternative, it is assumed that no new development or infrastructure improvements would occur on the *GCIA Employment Center* site at this time. The site would remain in its partially developed condition, and there would be no new temporary or permanent earth-related impacts.

3.1.3 Mitigation Measures

The following required/proposed mitigation measures address the potential earth-related impacts that could result from the construction and long-term use of Alternative 1 or 2.

Required/Proposed Mitigation Measures

Prior to and During Construction

- Site-specific subsurface investigations and geotechnical analyses would be performed as part of design and permitting of infrastructure and buildings associated with future site development.
- During construction, TESC measures and BMPs would be employed to control erosion. These measures could include the following:
    - Limit areas of exposure;
    - Schedule earthwork during drier times of the year;
    - Retain vegetation where possible;
    - Seed or plant appropriate vegetation on exposed areas as soon as earthwork is completed;
    - Route surface water through temporary drainage channels around and away from disturbed soils or exposed slopes;
    - Intercept and drain water from any surface seeps, if encountered;
    - Use silt fences, temporary sedimentation ponds, or other suitable sedimentation control devices to collect and retain eroded material;
    - Cover exposed soil stockpiles and exposed slopes with plastic sheeting, as appropriate;
    - Use straw mulch and erosion control matting to stabilize graded areas and reduce erosion and runoff impacts to slopes, where appropriate;
    - Incorporate contract provisions allowing temporary cessation of work under certain, limited circumstances, if weather conditions warrant; and
    - Construct stabilized construction entrances with rock pads or truck washing stations to limit excess soil materials from leaving the site.
- During the appropriate dry seasons, wherever possible, soils excavated from the site would be reused as on-site structural fill.

- Standard construction measures, such properly designed and installed temporary excavation shoring systems, and properly constructed open excavations, would be used to reduce the potential for adverse excavation impacts.
- Any necessary fill would be designed to control potential settlement impacts at adjacent structures/surfaces. As necessary, adjacent structures/surfaces would be monitored during construction to verify that no adverse settlement occurs.
- If drilled shafts are used to support buildings, they would include casing to control caving soils. As necessary, adjacent structures/surfaces would be monitored to verify that no adverse settlement and vibrations occur.
- The appropriate management of contaminated soils that could be disturbed and groundwater that could be encountered during redevelopment of the site would be addressed through the cleanup/remediation process and by institutional control requirements overseen by EPA (see Section 3.5, **Environmental Health**, for details).
- Buildings and infrastructure would be designed in accordance with the most current version of the International Building Code (IBC) to address potential life safety impacts from seismic events.

Operations

- A permanent stormwater control system would be installed in accordance with the *Ecology Stormwater Management Manual for Eastern Washington* to avoid long-term erosion, sedimentation and pollutant impacts on off-site water resources.

3.1.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse earth-related impacts are anticipated with implementation of the mitigation measures listed above.

3.2 AIR QUALITY/GREENHOUSE GAS (GHG) EMISSIONS

This section of the DEIS describes the air quality and GHG-related conditions on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the EIS alternatives are evaluated and mitigation measures identified. This section is based on the Air Quality/GHG Report (May 2015) prepared by Landau Associates (see **Appendix F**).

3.2.1 Affected Environment

Air Quality

Regulatory Context

Air quality is generally assessed in terms of whether concentrations of air pollutants are higher or lower than ambient air quality standards set to protect human health and welfare. Two agencies have jurisdiction over the ambient air quality at and in the vicinity of the site: the United States Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology). These agencies establish standards that govern both the concentrations of pollutants in the outdoor air, and contaminant emissions from air pollution sources.

The EPA established National Ambient Air Quality Standards (NAAQS) for the six criteria air pollutants and specified deadlines for which states are to develop and implement plans to comply. Ecology established the Washington State Ambient Air Quality Standards (WAAQS) for the same six criteria air pollutants that are at least as stringent as the national standards. The six criteria pollutants are: carbon monoxide (CO), ozone, particulate matter (PM)10/PM2.5, lead, nitrogen dioxide (NO_2) and sulfur dioxide (SO_2). Ecology is responsible for issuing air quality permits to industrial and commercial facilities that emit substantial amounts of air pollutants.

To track air quality conditions, the EPA and Ecology maintain a network of monitoring stations throughout the greater Puget Sound region. These stations are typically located where air quality problems may occur, and so are usually in or near urban areas or close to specific large air pollution sources. Other stations are used to indicate regional air pollution levels. Based on monitoring information collected over a period of years, the EPA and Ecology designate regions as being in "attainment" or "non-attainment" for particular air pollutants. Attainment status is therefore a measure of whether air quality in an area complies with the NAAQS. Regions that were once designated non-attainment that have since consistently attained the standard are considered "maintenance" areas. As of January 30, 2015, the EPA considers Grant County in an attainment area.

Criteria Air Pollutants

The following describes the sources and environmental effects of key criteria air pollutants considered in this analysis.

Carbon Monoxide (CO)

CO is a product of incomplete combustion generated by mobile sources, residential wood combustion and industrial fuel-burning sources. CO is a pollutant of concern related to on-road mobile sources because it is the pollutant emitted in the greatest quantity for which short-term health standards exist. CO is a pollutant with impacts that are usually localized, and CO concentrations typically diminish within a short distance from the emission source. The highest ambient concentrations of CO usually occur near congested traffic roadways and intersections during wintertime periods of air stagnation. Periods of cold temperatures (autumn and winter months), light winds, and stable atmospheric conditions reduce the atmospheric mechanisms that disperse and dilute pollutants. There are two short-term air quality standards for CO: a 1-hour average standard of 35 ppm and an 8-hour average standard of 9 ppm.

Among several types of point and non-point sources, on-road mobile sources (automobiles and trucks) contributed the highest portion of CO emissions (62 percent) in Grant County. Burning yard waste and land-clearing debris is not allowed at any time in Moses Lake, although some rural areas of Grant County allow residential burning (lawn and garden debris), recreational campfires and agricultural burning (with permit).

Ozone

Ozone is a highly reactive form of oxygen that is generated by an atmospheric chemical reaction with nitrogen oxides (NOx) and volatile organic compounds (VOCs), also known as ozone precursors. These precursors are emitted directly from industrial and mobile sources. Transportation equipment, such as automobiles and trucks, also significantly contribute to ozone precursor emissions. Ozone impacts are regional because the atmospheric reactions take time, and during this delay the precursor chemicals may disperse far from their point of emission.

The largest inventoried source of VOCs in Grant County is listed as natural emissions from soil and vegetation; however, anthropogenic, commercial, and consumer solvents contributed to nearly 20 percent of the total VOC emissions recorded in 2011.

Particulate Matter – PM10 and PM2.5

Ambient PM is generated by industrial sources, residential wood combustion, motor vehicle tailpipes, and fugitive dust from roadways, haul roads and unpaved surfaces. Ambient particulate matter standards focus on the more critical particle size fractions that are associated with human health effects. In some cases, fine PM may have additional inhalation risk by aiding transport of other toxic substances (pollutants that have adhered to the particle's surface) deep to human lung tissue.

Currently, ambient air quality standards are set for PM less than or equal to 10 micrometers in size (PM10) and PM less than or equal to 2.5 micrometers in size (PM2.5) because these groups of particles are found to most significantly impact human health and regional haze. The greatest ambient concentrations of PM generally occur near the point of emission, which in most cases would be near the unpaved roads (as fugitive dust is stirred into the air) and paved roads (from motor vehicle tailpipes). PM2.5 emissions have greater impact on ambient air quality than PM10 at locations farther from the emitting source because it remains suspended in the atmosphere longer and travels farther.

In Grant County, the dominant source of PM10 and PM2.5 emissions is attributed to agricultural tilling and harvesting.

Lead

Historically, the main source of lead pollution has been from the transportation sector, but lead emissions from tailpipes have drastically declined since EPA implemented regulatory efforts to remove lead from on-road motor vehicle gasoline. Currently, the major emission sources of lead are considered to come from lead smelters and metal processing plants or the combustion of aviation fuel.

One major industrial facility, REC Silicon, is established in Moses Lake and primarily smelts and refines non-ferrous metals (including lead); however, REC Silicon is approximately 5.5 miles southeast of the project site and is likely outside of the ambient air dispersion domain that would experience significant lead impacts from that facility.

Nitrogen Oxides and Sulfur Oxides

NOx and SOx are emitted by fuel-burning mobile and stationary sources. NOx and SOx pollution forms regional haze and may generate acid deposition.

Ambient concentrations of these pollutants within Grant County are below the NAAQS limits due to the rural nature of the county and the stringent air quality regulations that limit emissions from nearby industrial facilities. NOx from regional tailpipe emissions is one of the ozone precursors that additionally contribute to ozone issues. In Grant County automobiles and trucks contribute to the highest portion of NOx and SO_2 (57 percent and 28 percent, respectively) of total countywide emissions.

Four existing facilities (T K Holdings Inc., Moses Lake Industries Inc., Terex-Genie Industries, and SGL Automotive Carbon Fibers) operate within 1 mile of the project site and are required to report all on-site discharges of toxic air pollutants to the EPA’s Toxic Release Inventory (TRI) Program. Each of these four sites is a “minor source” facility (i.e., they emit less than the “major source” threshold values discussed previously) and is required to develop a pollution prevention program that includes management of all toxic releases.

The *GCIA Employment Center* site is currently generally contains airport-related uses—including aircraft hangars, office space, and vacant space—that pose no special issues related to air toxics. However, aircraft operations at Grant County International Airport could result in minor to moderate amounts of toxic air pollutant emissions due to the combustion of aviation fuel. Other non-aircraft-related operations that could generate minor amounts of toxic air pollutant emissions by fuel combustion include passenger travel to the airport by cars, trucks and buses, and tarmac vehicles such as airplane tugs, baggage vehicles and fuel tankers. Therefore, it is expected that air quality on and in the vicinity of the site adjacent to major roadways could be affected by minor to moderate concentrations of toxic air pollutants.

Energy

Climate Change and GHG Emissions

The global climate is continuously changing, as evidenced by repeated episodes of warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. Scientists have observed, however, an unprecedented increase in the rate of warming in the past 150 years. This recent warming has coincided with the Industrial Revolution, which resulted in widespread deforestation to accommodate development and agriculture, and an increase in the use of fossil fuels, which has released substantial amounts of GHG emissions into the atmosphere.

GHGs are a group of gases that, when present in the atmosphere, absorb or reflect heat that normally would radiate away from the earth, and thereby increases global temperature. GHGs include carbon dioxide (CO_2), methane (CH_4), NOx, water vapor, ozone and halocarbons, and can be emitted through both natural and human processes. Each individual constituent has its own global warming potential, but CO_2 is the GHG that is normally emitted in the greatest amount, and recognized to contribute most to climate change. To express the average emission rate and global warming potential of these combined GHG constituents, emission rates are commonly expressed as the equivalent amount of carbon dioxide (CO_2e).

Climate change is a global problem influenced by an array of interrelated factors that have concrete consequences for the Pacific Northwest. A 2009 report by the University of Washington's Climate Impacts Group found that climate change will significantly challenge the region's natural and built systems. Changes in temperature, precipitation and climate are expected to have a dramatic impact on plants and animals currently adapted to conditions that will no longer prevail.

The vast majority of worldwide emissions are beyond the scope of control for this project. In general, no single entity emits enough GHGs to solely influence global climate change, but cumulatively contributes to climate change through GHG emissions. Therefore, implementing reductions in GHG emissions would help mitigate human impacts on global warming, and could help the region better adapt to future climate change.

On-Site GHG Emissions

Existing GHG emissions on the *GCIA Employment Center* site are currently associated with industrial facilities, aerospace activities and transportation sources from vehicles traveling to/from and within the site.

Regulatory Context

United States Environmental Protection Agency (EPA)

The EPA enforces the Clean Air Act and has established air quality standards for common pollutants.

On December 7, 2009, the EPA signed the Endangerment and Cause or Contribute Findings for GHGs under Section 202(a) of the federal Clean Air Act (EPA 2009). Under the Endangerment Finding, the EPA determined that the current and projected concentrations of the six key, well-mixed GHGs (CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations. These findings did not set requirements on industry or other entities but through collaboration with the National Highway Traffic Safety Administration, the EPA finalized emission standards in May 2010 for light-duty vehicles (2012 to 2016 model years) and August 2011 for heavy-duty vehicles (2014 to 2018 model years).

State of Washington

In 2008, Ecology issued a memorandum stating that climate change and GHG emissions should be included in all SEPA analyses and committed to providing further clarification and analysis tools.

On June 1, 2010, Ecology issued draft guidelines entitled, *Guidance on Climate Change and SEPA*. These draft guidelines included: guidance regarding the types of GHG emissions that should be calculated; a discussion of how to determine if emissions surpass a threshold of "significance"; and a description of different types of mitigation measures. Guidance was also provided regarding the requirement to discuss the ability of a proposal to adapt to climate changes as a result of global warming. In 2011, Ecology narrowed the focus of the draft guidelines and in its place developed internal guidance for Ecology staff to use when Ecology is the lead agency or an agency with jurisdiction in *Guidance for Ecology Including Greenhouse Gas Emissions in SEPA Reviews* and *SEPA GHG Calculation Tool*. Ecology began using this guidance document in June 2011 (see **Appendix F** for details on air quality-related regulations.)

3.2.2 Impacts

This section analyzes air quality/GHG-related impacts on and in the vicinity of the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are noted.

Alternatives 1 and 2

Air Quality

Construction

During construction, fugitive dust from excavation and grading activities could temporarily cause a localized ambient concentration increase of PM10 and PM2.5. Construction activities would likely require the use of diesel-powered, heavy trucks and smaller equipment such as generators and compressors. These engines would emit air pollutants that could slightly degrade local air quality in the immediate vicinity of the activity. However, these emissions would be temporary and localized, and the resulting construction tailpipe emissions would likely be exceeded by emissions from existing pollution sources surrounding the project site.

Certain construction activities could cause odors detectable to some people in the vicinity of that activity, especially during paving operations that use tar and asphalt. Such odors would also be localized and short-term. Slash burning would not be permitted in association with construction activities, unless approved by Ecology.

Construction equipment and material hauling could temporarily cause traffic delays on streets adjacent to a construction area. If such delays increase traffic flow enough to reduce travel speeds by a significant amount, general traffic-related emissions could increase.

Operation

Localized Transportation-Related Impacts

Under both Alternative 1 and 2, localized CO impacts could occur at major intersections that experience significant traffic congestion. Ongoing EPA motor vehicle regulations have caused steady decreases in tailpipe emissions of CO from individual vehicles and exceedances of the NAAQS limits for CO are now extremely rare even at the most heavily congested downtown intersections within the State of Washington. Therefore, it is unlikely that air quality impacts at local intersections would be significant (see **Section 3.10**, **Transportation**, for additional details on anticipated traffic congestion).

Industrial Operation Emissions

Under both Alternative 1 and 2, the project area is expected to experience air quality impacts due to industrial operations. The nature of the air quality impacts would depend on the type of business that is operated, but could include emissions of criteria pollutants, toxic air pollutants or other non-toxic odor-producing emissions from stationary or mobile sources. Unless properly controlled, air pollutant-emitting equipment and trucks at loading docks could contribute to air pollution in the vicinity. Air quality impacts from future business operations are likely to be greater under Alternative 1 due to the focus on heavy manufacturing, which is more likely to have pollutant-emitting industrial equipment than the light industrial development that would be associated with Alternative 2. Additionally, Alternative 1 would focus on warehouse uses, which would result in greater mobile source air emissions than Alternative 2 due to the likelihood of greater VMT (longer distances) by heavy-duty distribution trucks.

Large stationary air pollutant-emitting industrial equipment must be registered and permitted with Ecology. Ecology requires all commercial and industrial facilities to use best available control technology (BACT) on stationary equipment to minimize emissions (see **Appendix F** for examples of BACTs). Ecology may require an applicant with high emissions to conduct an air quality assessment to demonstrate that the proposed emissions would not expose off-site areas to ambient pollutant concentrations that exceed regulatory limits. Additionally, EPA on-road emissions standards for new heavy trucks require the use of selective catalytic reduction to control NO_x emissions and diesel particulate filters to control PM emissions. Therefore, it is unlikely that new industrial development would cause significant air quality issues.

Indirect and Cumulative Impacts

In general, regional smog issues are caused largely by tailpipe emissions from cars and trucks traveling on public streets. For this analysis, it was assumed that the relative amounts of regional tailpipe emissions caused by each alternative would be proportional to the regional vehicle miles travelled (VMT) by each alternative. Both Alternatives 1 and 2 would increase regional VMT, which would contribute to tailpipe emissions throughout Grant County. When added to the forecast population and economic growth throughout the county, the increased emissions caused by development of the project site could slightly contribute to future worsening of regional air quality.

Tailpipe emissions from vehicles traveling on public streets are one of the largest sources of air pollutant emissions associated with development of the *GCIA Employment Center*. However, as the EPA places emission control requirements on all road vehicles, the decrease in future per-vehicle emission rates could offset the forecasted increase from project-related growth in VMT. In such a case, ambient air quality impacts from on-road vehicles would remain approximately the same as existing levels, or even gradually decrease compared to existing levels.

Additionally, proposed development under Alternatives 1 and 2 would require future improvements to existing roadways. In some cases, when a street is widened tailpipe emissions move closer to nearby human receptors and the localized level of mobile source air toxic (MSAT) emission impacts become greater than before. However, reductions in congestion associated with an improved traffic plan could help offset the potential for such localized increases in MSAT impacts. Over time and on a regional basis, the EPA's vehicle and fuel regulations (coupled with ongoing future fleet turnover) should significantly reduce ambient MSAT levels.

GHG Emissions

The scale of global climate change is so large that a project's impacts can only be considered on a "cumulative" scale. It is not anticipated that a single project would have an individually discernible impact on global climate change. It is more appropriate to conclude that GHG emissions associated with development under Alternatives 1 and 2 would combine with emissions across the state, country, and planet to cumulatively contribute to global climate change.

The following analysis estimates the GHG emissions associated with development at the *GCIA Employment Center* site under Alternatives 1 and 2. This analysis provides a screening-level estimate of life-cycle GHG emissions for the project area, and does not include individual large stationary industrial sources or any special project-level emission reduction measures or other mitigation measures.

For purposes of this DEIS analysis, Ecology's June 3, 2011, *Guidance for Ecology Including Greenhouse Gas Emissions in SEPA Reviews* and *SEPA GHG Calculation Tool* was used to estimate potential GHG emissions associated with development under Alternatives 1 and 2, determine the potential level of significance, and identify potential mitigation measures. Potential significant levels of GHG emissions for development projects are identified by Ecology as emissions levels that are greater than 25,000 metric tons per year. A summary of the potential annual GHG emissions under Alternatives 1 and 2 is provided below (see **Appendix F** for the full GHG emission worksheets).

The projected GHG emissions increase for Alternative 1, above existing emissions, is expected to be approximately 416,788 $MTCO_2e$ per year. The projected GHG emissions increase under Alternative 2, above existing emissions, is expected to be 406,553 $MTCO_2e$ per year; slightly lower than Alternative 1. Total GHG emissions for Washington State were forecast to be about 114,100,000 $MTCO_2e$ per year in 2035. In comparison to state-wide annual GHG emissions, the increase for Alternative 1 and Alternative 2 is not considered significant as no single project emits enough GHG to solely influence global climate change.

Development under Alternative 1 would emphasize heavy manufacturing and warehouse uses. Alternative 1 would disturb a greater surface area than Alternative 2 resulting in increased "soil carbon" emissions. The energy emissions related to building heating/cooling and power would be less demanding for manufacturing/warehouse uses (Alternative 1) than for light industrial/technology uses (Alternative 2). Thus, Alternative 1 would result in less energy-related GHG emissions. Additionally, warehouse use is assumed to have fewer vehicle trips per buildable square foot, but the VMT per trip is expected to be greater because trucks transporting goods to and from the warehouses are expected to travel longer distances than vehicles traveling to/from non-warehousing uses. Therefore, the anticipated GHG emissions estimate attributed to transportation is slightly higher for Alternative 1 that for Alternative 2 (see **Appendix F** for the GHG calculation worksheets).

Alternative 2 would generate more jobs and therefore more employee commute VMT than Alternative 1. However, the vehicle miles per trip are anticipated to be fewer for Alternative 2 due to the nature of those trips (i.e., employees commuting to work from their nearby residences) compared to Alternative 1, which would have more warehousing uses with goods being transported over long distances. Therefore transportation-related GHG emissions for Alternative 2 are expected to be less than Alternative 1, but greater than existing conditions (see **Appendix F** for the GHG calculation worksheets).

Alternative 3

Under Alternative 3, the No Action Alternative, it is assumed that no new development or infrastructure improvements would be developed on the *GCIA Employment Center* site at this time. The site would remain in its partially developed condition, and there would be no new sources of air pollutants or GHG emissions.

3.2.3 Mitigation Measures

The following required/proposed mitigation measures address the potential air quality/GHG-related impacts that could result from the construction and long-term use of Alternative 1 or 2.

Required/Proposed Mitigation Measures

Prior to and During Construction

- As necessary, construction contractors would prepare and implement air quality control plans for construction activities at the site. These plans would feature BMPs to control fugitive dust and odors emitted by diesel-fired construction equipment, and could include:
    - Use water sprays or other non-toxic dust control methods on unpaved roadways;
    - Minimize vehicle speed while traveling on unpaved surfaces;
    - Prevent track-out of mud onto public streets;
    - Cover soil piles when practical;
    - Minimize work during periods of high winds when practical;
    - Maintain the engines of construction equipment according to manufacturers' specifications; and
    - Minimize idling of equipment while the equipment is not in use.
- As necessary, if there is regular heavy traffic during some periods of the day during construction, haul traffic would be scheduled during off-peak times (e.g., between 9:00 AM and 4:00 PM) to minimize the effect on traffic and mitigate indirect increases in traffic-related emissions.

- Burning of slash or demolition debris would not be permitted without approval from Ecology.
- As required by Ecology, any future development that could potentially cause an increase of criteria or toxic air pollutant emissions that would exceed exemption threshold levels specified in WAC 173-400-110 or WAC 173-460-150 would obtain a Notice of Construction Approval order prior to construction and use BACT on stationary equipment to minimize emissions.

During Operation

- As possible, trip-reduction and energy conservation measures would be provided to reduce GHG reductions.
- As possible, GHG emission reductions would be achieved by using building design and construction methods that incorporate recycled construction materials, reduce space heating and electricity usage, incorporate renewable energy sources and reduce water consumption and waste generation (see **Appendix F** for further possible mitigation measures to reduce GHG emissions).

3.2.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse air quality/GHG-related impacts are anticipated with implementation of the mitigation measures listed above.

3.3 WATER RESOURCES

This section of the DEIS describes the existing water resources on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the EIS alternatives are evaluated and mitigation measures identified. The surface water portion of this section is based on the *Critical Areas/Plants and Animals* report (May 2015) prepared by GeoEngineers (see **Appendix B**). The groundwater portion of this section is based on the *Geotechnical* report (May 2015) prepared by Landau Associates (see **Appendix A**).

3.3.1 Affected Environment

Regulatory Context

The following federal, state and local permits and regulations could apply to development of the *GCIA Employment Center* site:

- 40CFR122 National Pollutant Discharge Elimination System (NPDES) Program (State program);
- State Washington State Department of Ecology (Ecology) Construction Stormwater General Permit (State permit); and
- The project site is within the local jurisdiction of Grant County and the City of Moses Lake. Both jurisdictions regulate stormwater runoff (GCC 23.12.08 and MLC 13.035) (Local regulations).

Surface Water

Stormwater drainage at the *GCIA Employment Center* site generally follows the site's topography which has a slight downward slope from west to east. A drainage swale is present in the eastern portion of the site which slopes to the southeast (see **Figure 2-4**).

No wetlands, streams or other surface water features were identified within the *GCIA Employment Center* site during a March 2015 field investigation for this EIS. Washington State Department of Fish and Wildlife (WDFW) has mapped an intermittent/ephemeral stream within the project site; however, this stream was not identified during the field investigation. The closest surface water features to the site are Crab Creek and Moses Lake, which occur approximately 0.5 mile east and 1.5 miles west of the site, respectively (see **Figure 2-2**). The National Wetlands Inventory (NWI) identifies two potential wetlands immediately east of the site, across Road J NE in an active agricultural field. The presence or absence of these wetlands was not confirmed for this EIS because these potential wetland features are located on private property outside of the site. However, aerial photograph interpretation indicates that this active farmland does not appear to contain the mapped potential wetland features. Numerous additional wetlands are mapped further east of the site associated with the Crab Creek floodplain (see **Appendix B** for details on field investigations for critical areas and surfaces water features in the site vicinity.)

According to Grant County and City of Moses Lake critical area mapping, the site is not situated in a flood-prone area.

Groundwater

Subsurface exploration data for the area in the vicinity of the *GCIA Employment Center* site indicates that groundwater, where encountered, is typically greater than 50 feet below ground surface (BGS).

City Wells

Water service is provided to the *GCIA Employment Center* site by the City of Moses Lake and the site lies within the Larson service zone. Since the early 1940s, groundwater has been the source for the municipal water supply; and a series of wells supply water to the City (see Section 3.12, **Utilities** and **Appendix D** for additional information on the City's water supply).

Critical Aquifer Recharge Areas

Critical aquifer recharge areas (CARAs) are defined by Grant County as those areas having a critical recharging effect on aquifer use for potable water in community systems. Critical aquifer recharge areas are classified and designated as follows:

(1) Those areas designated as "Wellhead Protection Areas" pursuant to WAC 246-290-135(4) and the groundwater contribution area in WAC 246-291-100 (2)(e). Wellhead protection areas shall, for the purpose of this regulation, include the identified recharge areas associated with either Group A public water supply wells and those Group B wells with a wellhead protection plan filed with the Grant County Health District; and

(2) Any land identified in the Soil Survey of Grant County as having high potential for aquifer recharge, as determined by the Administrative Official (GCC 24.08.400).

The City of Moses Lake defines aquifer recharge areas as areas which serve as critical groundwater recharge areas and which are highly vulnerable to contamination from intensive land uses within these areas (MLC 19.03.050).

The entire county, including the *GCIA Employment Center* site, is considered an aquifer recharge area by the County.

Contaminated Soil and Groundwater

Some of the site and surrounding areas include portions of the former Larson Air Force Base. Base operations, including aircraft movements, maintenance, fabrication and related activities by the U.S. Air Force and associated aerospace suppliers created areas of contaminated soil and groundwater. The U.S. Environmental Protection Agency (EPA) has designated portions of the former base and surrounding areas as the Moses Lake Wellfield Superfund Site and has been overseeing soil and groundwater cleanup efforts since 1992. Three trichloroethene (TCE) plumes have been identified within the former base boundaries, near the southern portion of the site. In addition, 39 contaminated soil sites have been identified within the former Air Force base; some of these are located immediately adjacent to or could be partially within the site. Soil contaminants identified at these locations include heavy metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), petroleum hydrocarbons, asbestos, perchlorate and discarded military munitions.).

A Gun Club was located in the eastern portion of the site on property owned by the City of Moses Lake. This facility was used for target practice by the City of Moses Lake Police Department. Lead is frequently deposited at gun clubs/shooting ranges as spent lead shot (pellets) at clay target shooting ranges and spent lead bullets in soil berms at rifle/pistol shooting ranges; this contaminant is likely present in this portion of the site

(See Section 3.5, **Environmental Health**, for details on contaminated soil and groundwater at the site.)

Stormwater Drainage

Approximately 141 acres of the site (11 percent) are presently in impervious surface areas including: buildings, loading areas, parking lots, roads, sidewalks and airport taxiways. The remaining approximately 1,117 acres of the site (approximately 89 percent) is in natural open space and landscaping.

The site is located in one of the driest portions of Washington State, and is classified as having a semi-arid climate. Annual average rainfall ranges from six to eight inches. Existing stormwater flows from the site and vicinity generally are not actively managed. Roads on and in the vicinity of the site are of open-ditch construction with no enclosed storm drainage systems within the public rights-of-way. What little flow may be generated by an intense rainstorm or rapid snow melt follows open ditches that generally flow to the east and northeast and eventually flow beneath Stratford Road toward Crab Creek. Lesser flows dissipate and infiltrate into soils along the ditch flow-line.

Some of the larger apron areas along Taxiway "G", located to the west of the site, have catch basin structures to collect stormwater runoff. These catch basins are connected by pipes that direct flows to adjacent undeveloped areas where the flows dissipate and infiltrate into site soils.

3.3.2 Impacts of the Alternatives

This section identifies and analyzes impacts to water resources on and in the vicinity of the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are so noted.

Alternatives 1 and 2

Surface Water

Construction Impacts

Construction activities under Alternatives 1 and 2 could result in short-term impacts to off-site surfaces water resources (e.g., wetlands and streams). Erosion and sedimentation, as well as pollutants from construction equipment and vehicles, could impact the hydrology and water quality functions of existing off-site water resources (i.e., Crab Creek and its associated wetlands). To avoid these potential impacts, construction activities would be subject to the Construction Stormwater General Permit issued by Ecology. Temporary erosion and sedimentation control (TESC) and Best Management Practices (BMPs) would be implemented to control runoff during construction, consistent with the *Ecology Stormwater Management Manual for Eastern Washington*. These temporary facilities could include silt fences, interceptor swales, sediment traps/ponds and other BMPs to manage stormwater runoff during construction (see Section 3.1, **Earth,** and **Appendix A** for details). With implementation of these temporary stormwater control facilities/measures, no significant impacts are expected.

Wetlands, streams, and their associated buffers would generally be protected per critical area regulations contained in GCC 24.08 and MLC 19.03. No direct impacts to off-site wetlands, streams and their associated buffers (i.e., by temporary or permanent fill) are proposed with development of the *GCIA Employment Center*.

As mentioned previously, portions of the site in the Moses Lake Wellfield Contamination Superfund Site will undergo cleanup/remediation under the oversight of EPA. Certain activities related to development, including temporary stormwater control, would be conducted in accordance with institutional controls defined by EPA in the final remediation plans (see Section 3.5, **Environmental Health**, for details).

Operational Impacts

At build-out under Alternative 1, it is assumed that approximately 1,084 acres (86 percent of the site) would be covered in impervious surfaces (about 75 percent more of the site than under existing conditions); at build-out under Alternative 2, it is assumed that approximately 1,007 acres (80 percent of the site) would be covered in impervious surfaces under Alternative 2 (about 6 percent less of the site than under Alternative 1). The increase in impervious surfaces under Alternatives 1 and 2 would increase the rate and volume of stormwater runoff, and decrease the area available to infiltrate stormwater relative to existing conditions. Operation of future development could impact the hydrology and water quality of surface and groundwater resources on and in the vicinity of the site, such as Crab Creek and its associated wetlands.

Vehicular traffic is the primary stormwater contaminant source from industrial developments similar to the proposed *GCIA Employment Center*. Vehicles typically deposit an array of organic and inorganic pollutants to roadways and parking areas, which accumulate and then wash off with stormwater runoff. These can include heavy metals, petroleum products and solids. Oils and greases contain lead and zinc, tire wear contributes zinc, moving parts of automobiles wear and deposit lead and copper, and brake linings and protective coatings to undercarriages contain copper. Street pavement degrades over time, and may contribute suspended sediments to stormwater runoff. Roadways also collect runoff from driveways and landscaping when rainfall is heavy enough to saturate soils. Concentrations of pollutants in stormwater are highly variable by site, and are affected by numerous factors such as traffic and parking characteristics, storm intensity, rainfall pattern within a given storm, amount of time since the last storm, road maintenance (such as street sweeping) and airborne contributions from adjacent land uses.

To minimize the potential for impacts to surface water resources from greatly increased surface water runoff and stormwater contaminants, a permanent stormwater control system would be provided based on a phased or comprehensive program. Any permanent stormwater control systems(s) for future development at the site would be developed and constructed in accordance with the *Ecology Stormwater Management Manual for Eastern Washington*. Stormwater would be retained within the site and water quality treatment would be provided for runoff from pollution-generating surfaces (e.g., roads and parking areas). With implementation of the permanent stormwater control system, no significant impacts to surface water resources are expected.

If stormwater controls like ponds that create open water are used for flow control or water quality treatment, they would be designed in accordance with the Federal Aviation Administration's (FAA) Advisory Circular 150/5200-33A and the Port of Moses Lake's landscape standards to ensure that no wildlife or avian habitat is created within the vicinity of the airport.

Groundwater

Construction Impacts

Construction activities under Alternatives 1 and 2 could result in short-term impacts to groundwater resources. As indicated under *Affected Environment*, groundwater is expected to be present at over 50 feet BGS. Due to the relatively deep depth to groundwater at the site and the relatively shallow depth of planned excavations (two feet or less) and permanent development features, no impacts to deep aquifers would be anticipated as a result of construction activities under Alternatives 1 and 2. It is anticipated that construction dewatering would not be necessary, and dewatering impacts to the subsurface environment are unlikely.

Operational Impacts

Operation of proposed development under Alternative 1 could result in long-term impacts to groundwater resources. As indicated above, total impervious surfaces would increase from the existing approximately 141 acres (approximately 11 percent of the project site) to approximately 1,084 acres (approximately 86 percent of the project site); Alternative 2 would increase impervious surfaces to approximately 1,007 acres (approximately 80 percent of the site). As a result of the increased area in impervious surfaces on the site, the area available for stormwater infiltration would decrease and potentially reduce groundwater recharge at the site. As noted in *Affected Environment*, the entire County, including the project site, is considered an aquifer recharge area. Impacts to groundwater quality could also occur if infiltrated stormwater contains contaminants.

Groundwater impacts could result with site development if stormwater runoff and collection from impervious surfaces locally modifies the underlying groundwater table. In particular, infiltration of stormwater runoff could result in mounding or other changes to the groundwater gradient around the three known TCE plumes that are present at the Moses Lake Wellfield Superfund Site on and in the vicinity of the *GCIA Employment Center* site. Improper siting of stormwater infiltration facilities could accelerate the transport of soil contaminants into the groundwater table. The stormwater control system would be designed and installed in accordance with institutional controls defined by EPA in the final remediation plans (see Section 3.5, **Environmental Health**, for details).

Operational impacts on groundwater could also occur as a result of the additional demand for domestic water under Alternatives 1 and 2. With approved water rights as currently being sought by the City of Moses Lake, the City's water system has ample capacity to serve both Phase 1 and full build-out of the *GCIA Employment Center* under the development alternatives. However, full build-out of Alternative 1 would outstrip capacity of the current Larson zone in which the site is located without drilling additional wells. The Larson zone would accommodate Phase 1 development of Alternative 1. The zone would have some reserve capacity after accommodating water demand for full build-out of Alternate 2 (see Section 3.12, **Utilities**, and **Appendix D** for details).

Alternative 3

Under Alternative 3, the No Action Alternative, it is assumed that no new development or infrastructure improvements would be developed on the *GCIA Employment Center* site at this time. The site would remain in its partially developed condition, and there would be no new temporary or permanent impacts to surface water and groundwater resources. The existing stormwater control system onsite would likely be maintained.

3.3.3 Mitigation Measures

The following required/proposed mitigation measures would address the potential impacts to water resources that could result from the construction and long-term operation of Alternative 1 or 2.

Required/Proposed Mitigation Measures

Prior to and During Construction

- Construction activities would be subject to the Construction Stormwater General Permit issued by Ecology.

- TESC and BMPs would be implemented to control stormwater runoff during construction, consistent with the *Ecology Stormwater Management Manual for Eastern Washington*.
- Stormwater management systems would be sited and designed in accordance with institutional controls defined by EPA in the final remediation plans for the Moses Lake Wellfield Superfund Site (see Section 3.5, **Environmental Health**, for details)

During Operation

- Permanent stormwater control system(s) would be designed and installed in accordance with the *Ecology Stormwater Management Manual for Eastern Washington* to avoid long-term erosion, sedimentation and pollutant impacts on off-site water resources.

3.3.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to water resources are anticipated with implementation of the mitigation measures listed above.

3.4 PLANTS AND ANIMALS

This section of the DEIS describes existing plants and animals and their habitat on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the EIS alternatives on plants and animals are evaluated and mitigation measures identified. This section is based on the *Critical Areas/Plants and Animals Report* (May 2015) prepared by GeoEngineers (see **Appendix B**).

Methodology

Existing information was collected and reviewed for plants, fish and wildlife that may occur on and in the vicinity of the *GCIA Employment Center* site, including: Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) maps and database, Washington Department of Natural Resources (DNR) Forest Practices Application Review System (FPARS) and WDFW SalmonScape mapping. In addition, aerial photographs of the project site from Google were reviewed to identify potential vegetation changes, existing areas of development and other potential habitat features.

Field reconnaissance of the site was conducted in March 2015 to characterize any fish and wildlife habitat conservation area conditions that may be present.

Sources of literature consulted prior to the field investigation included documented possible wildlife habitat relationships, the U.S. Fish and Wildlife Service (USFWS) endangered and threatened species list for Grant County and WDFW PHS map data. Fish and wildlife habitat conservation areas were assessed according to the appropriate jurisdictional codes.

For the purposes of this analysis, the following definitions have been used when discussing suitable habitat, critical habitat and priority habitat:

- **Suitable Habitat** – habitat that contains features or characteristics that are needed for plants and/or wildlife to exist in that area. Typically, suitable habitat would be capable of supporting viable plant and/or animal populations.
- **Critical Habitat** – a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery.
- **Priority Habitat** – habitat types or elements with unique or significant value to a diverse assemblage of species. A priority habitat may consist of a unique vegetation type, a dominant plant species, a described successional stage or a specific habitat feature.

3.4.1 Affected Environment

Regulatory Context

The following federal, state and local permits and regulations could be applicable to the development of the *GCIA Employment Center* site:

- Federal permits, in general, originate from the U.S. Army Corps of Engineers (USACE) and are triggered by impacts to Waters of the United States (U.S.) or other federal nexus that would require consultation on federally listed species.
- State permits are regulated through multiple agencies, including DNR, Washington State Department of Ecology (Ecology) and WDFW. Depending on the location and type of project, guidance from state agencies through local permit requirements may suffice.
- The project site is within the local jurisdiction of Grant County and the City of Moses Lake. Both jurisdictions regulate not only activities within wetlands and streams, but also activities within critical area buffers and habitat conservation areas. The site and vicinity is considered a habitat conservation area according to Grant County Code (24.08.300) and City of Moses Lake Municipal Code (19.03.170) because the area contains suitable habitat for several state candidate species.

The *GCIA Employment Center* site includes portions of the GCIA and surrounding industrial development. The remainder of the site is largely undeveloped and consists of shrub-steppe habitat with a mix of sagebrush vegetation communities and grasses. Existing buildings and remnants of the previous military and other industrial activities are present on portions of the site, including piles of discarded concrete, rock and asphalt. Vegetation within the site generally consists of shrub-steppe habitat dominated by common rubber brush (*Ericameria nauseosus*) and sagebrush species (*Artemisia* spp.) with sparse amounts of yarrow (*Achillea millefolium*) and various grasses.

The project site and vicinity likely provide habitat for wildlife including resident and migratory birds, reptiles and small to medium-sized mammals such as rodents, shrews and coyotes. Evidence of wildlife at the site included observations of various songbirds, coyote scat, a rodent skull and numerous mammal burrows found throughout the approximately 1,258-acre site.

The potential for the presence of species listed under the federal Endangered Species Act and/or listed as Priority Species by the State of Washington is described below. No fish or amphibians are included below because the *GCIA Employment Center* site does not contain aquatic features. **Table 3.4-1** summarizes federal and state-listed species data for the project site. Critical habitat for listed species was not identified or mapped within the site.

Table 3.4-1
GRANT COUNTY PRIORITY WILDLIFE SPECIES

	Common Name	Scientific Name	State Status	Federal Status	Potential to Occur on Site
Reptiles	Striped whipsnake	*Masticophis taeniatus*	C	N/A	Yes – suitable habitat
	Sagebrush lizard	*Sceloporus graciosus*	C	N/A	Yes – suitable habitat
Birds	American white pelican	*Pelecanus erythrorhynchos*	E	N/A	No
	Bald eagle	*Haliaeetus leucocephalus*	S	SoC	No
	Ferruginous hawk	*Buteo regalis*	T	SoC	Yes – suitable habitat
	Golden eagle	*Aquila chrysaetos*	C	N/A	Yes – suitable Foraging Habitat. No Suitable Nesting Habitat
	Peregrine falcon	*Falco peregrinus*	S	SoC	No
	Greater sage-grouse	*Centrocercus urophasianus*	T	C	Yes – suitable habitat and mapped about 2.5 miles from site
	Sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	T	SoC	No – suitable habitat present but only known to occur in Lincoln, Douglas, and Okanogan Counties
	Clark's grebe	*Aechmophorus clarkia*	C	N/A	Yes – suitable habitat approximately 1.5 miles from site along Moses Lake shoreline
	Western grebe	*Aechmophorus occidentalis*	C	N/A	Yes – suitable habitat approximately 1.5 miles from site along Moses Lake shoreline
	Sandhill crane	*Grus canadensis*	E	N/A	No
	Yellow-billed cuckoo	*Coccyzus americanus*	C	T	No
	Burrowing owl	*Athene cunicularia*	C	N/A	Yes – suitable habitat and mapped within 1.5 miles of site
	Lewis' woodpecker	*Melanerpes lewis*	C	N/A	No
	Loggerhead shrike	*Lanius ludovicianus*	C	N/A	Yes – suitable habitat
	Sagebrush (or sage) sparrow	*Amphispiza belli*	C	N/A	Yes – suitable habitat

Table 3.4-1 Continued

	Common Name	Scientific Name	State Status	Federal Status	Potential to Occur on Site
Mammals	Merriam's shrew	*Sorex merriami*	C	N/A	Yes – suitable habitat
	Preble's shrew	*Sorex preblei*	C	N/A	Yes – suitable habitat
	Townsend's big-eared bat	*Corynorhinus townsendii*	C	N/A	Yes – Bats can roost in artificial structures such as buildings; doesn't appear to have natural roosting habitat.
	Black-tailed jackrabbit	*Lepus californicus*	C	N/A	Yes – suitable habitat
	Pygmy rabbit	*Brachylagus idahoensis*	E	E	No – suitable habitat present but only known to be in Douglas County
	White-tailed jackrabbit	*Lepus townsendii*	C	N/A	Yes – suitable habitat
	Washington ground squirrel	*Urocitellus washingtoni*	C	C	Yes – suitable habitat
	Gray wolf	*Canis lupus*	E	E	No – suitable habitat present but no documented wolves in the area
Invertebrates	Silver-bordered fritillary	*Boloria selene atrocostalis*	C	N/A	No
	Yuma skipper	*Ochlodes yuma*	C	N/A	No

Source: GeoEngineers, 2015.

Note:

* E = Endangered, T = Threatened, C = Candidate, SoC – Species of Concern, S = Sensitive, M = Monitored

* Fish and amphibian species are not listed in this table because no streams or other waterbodies (including wetlands) were identified during the field investigation.

* The above list of priority species is from WDFW 2012 distribution of priority species by County and the USFWS species list for the project site. There are no National Marine Fisheries Service (NMFS) listed species within the project area due to lack of streams, wetlands and other waterbodies.

* Field survey conducted on March 18, 2015 to document habitat conditions.

Animals

Threatened, Endangered and Sensitive animal species are identified by both federal and state agencies. At the federal level, the USFWS lists threatened and endangered species and designates critical habitats by County. State threatened, endangered and sensitive species lists are maintained by WDFW. Federal and state-listed animal species are described below and included in **Table 3.4-1**

Federally Listed Species

Pygmy rabbit and gray wolf are listed as federally endangered and yellow-billed cuckoo is listed as threatened. Federal candidate species include Washington ground squirrel and greater sage grouse, and species of concern include bald eagle, ferruginous hawk and peregrine falcon.

Pygmy rabbit, gray wolf and yellow-billed cuckoo are not expected to occur at the *GCIA Employment Center* site. However, the site contains suitable habitat for Washington ground squirrel, greater sage grouse, bald eagle, ferruginous hawk and peregrine falcon. The likelihood of occurrence of these species at the site is discussed later in this section.

Washington State Listed Species

Pygmy rabbit, gray wolf, American white pelican and sand hill crane are listed as state endangered, and greater sage grouse and ferruginous hawk are listed as state threatened species. State candidate species include Washington ground squirrel, white-tailed jackrabbit, black-tailed jackrabbit, Townsend's big-eared bat, Preble's shrew, Merriam's shrew, Clark's grebe, western grebe, golden eagle, burrowing owl, Lewis' woodpecker, loggerhead shrike, yellow-billed cuckoo, sagebrush (or sage) sparrow, silver-bordered fritillary and Yuma skipper. State sensitive species include bald eagle and peregrine falcon, while black-crowned night-heron, great blue heron, and prairie falcon are listed as monitored. The likelihood of these species to occur at the site is discussed later in this section.

State Priority Habitat and Species

WDFW PHS data depict locations of priority habitats and species. According to the PHS maps, no federally listed terrestrial or aquatic threatened or endangered species are located on or within 1,000 feet of the *GCIA Employment Center* site.

PHS data maps the project site as long-billed curlew habitat. Other priority animal sightings within three miles of the project site include burrowing owl, greater sage-grouse and ring-necked pheasant. Waterbodies within three miles of the site (Crab Creek and Moses Lake) include documented occurrences of rainbow trout (*Oncorhynchus mykiss*), shorebird concentrations, and waterfowl concentrations.

As stated above, burrowing owls are a state candidate species and greater sage grouse are listed as threatened. Ring necked pheasants, rainbow trout, shorebird concentrations and waterfowl concentrations are not state threatened or endangered species.

The only priority habitat mapped on the project site is for long-billed curlew. Priority habitats mapped within three miles of the project site include wetland habitat to the east, south and west, and shorebird and waterfowl concentrations to the east.

Key Wildlife Species Potential to Occur at the Site

Burrowing Owl

Burrowing owls, a state candidate species, are widespread in the southern part of Washington State, but numbers fluctuate and breeders are limited to areas with suitable burrow sites. In most areas, numbers of burrowing owls are declining, and losses appear to be pronounced in the channeled scablands, Okanogan Valley and southeast Washington.

According to breeding bird survey data for Washington, there was an estimated 1.5 percent annual decline from 1968 to 2005, which equated to an overall decline of 45 percent. Currently, Grant and Franklin Counties hold over half the nest sites in Washington State, occupied or historical.

The western burrowing owl is a grassland specialist distributed throughout western North America, primarily in open areas with short vegetation and bare ground in desert, grassland and shrub-steppe environments. Burrowing owls are generally dependent on the presence of mammals (such as ground squirrels), whose burrows are used for nesting and roosting. Nests could also be located in natural cavities in small rock outcrops. Burrowing owl nesting habitat consists of open areas with mammal burrows and they use a wide variety of arid and semi-arid environments, with well drained soils, level areas characterized by sparse vegetation and bare ground. According to a 1987 survey, within Washington State approximately 21 percent of identified nests were observed within artificial burrows such as culverts or irrigation pipes, and about 75 percent of the nests were found within 50 feet of roadways; this seems to indicate that disturbed artificial situations are often used by burrowing owls within Washington.

Much of the undeveloped areas of the project site currently contain shrub-steppe habitat and grassland habitat which is the burrowing owl preferred habitat. In addition, according to a *2010 Burrowing Owl Site Assessment Report* prepared for an adjacent property, burrowing owl nests were identified within the project area.[1] Burrowing owls were not identified; however, during a site assessment conducted for this EIS on March 18, 2015. However, suitable habitat and potential nest sites (mammal burrows near rock and riprap piles) were discovered in various areas throughout the site. Therefore, there is potential for the burrowing owl to be found within the site.

Other Shrub-Steppe Species

Based on preferred habitat characteristics from **Table 3.4-1** for Grant County priority wildlife species, greater sage grouse, sharp tailed grouse, Washington ground squirrel, loggerhead shrike, long-billed curlew, Merriam's shrew, Preble's shrew, black-tailed Jackrabbit and white-tailed jackrabbit could be present within the project site. These animal species typically occur in shrub steppe and open grassland habitat areas, both of which occur within the site.

[1] URS. 2010. *Burrowing Owl Site Assessment Report and Mitigation Plan, ASPI Group Industrial Park Project*. February 1.

Plants

Federally Listed Species

The only federally listed plant species within Grant County is Ute ladies'-tresses. A federal candidate species within Grant County is Wormskiold's northern wormwood, and species of concern include Wanapum crazyweed and persistent-sepal yellowcress (see **Table 3.4-2**).

The *GCIA Employment Center* site does not contain suitable habitat for persistent-sepal yellowcress. However, the site contains suitable habitat for Wormskiold's northern wormwood and Wanapum crazyweed which are found in shrub-steppe and grasslands. The likelihood of occurrence of these species within the site is discussed later in this section.

Washington State Listed Species

There are 15 state-listed threatened and endangered plant species found within Grant County. No candidate or species of concern species are expected to occur within the *GCIA Employment Center* site. State-listed plant species are identified in **Table 3.4-2**. The likelihood of occurrence of these species within the site is discussed later in this section.

Washington Natural Heritage Program (WNHP)

The WDNR lists 43 rare plant species that are known to occur in Grant County. A search of the WDNR NHP database revealed no records of any listed plants, high quality ecosystems or other significant natural features on or within the vicinity of the project site. **Table 3.4-2** lists only the state and federally listed rare plant species (15 of the 43 rare species) that could potentially occur onsite and in the site vicinity.

Key Plant Species Potential to Occur at the Site

Based on preferred habitat characteristics from **Table 3.4-2**, the following species could be present within the *GCIA Employment Center* site: Great Basin gilia, Wormskiold's northern wormwood, Palouse milk-vetch, white eatonella, Nuttall's sandwort and Wanapum crazyweed. These rare plant species typically occur in shrub steppe and open grassland habitat areas, both of which occur within the project site.

3.4.2 Impacts of the Alternatives

This section analyzes impacts to plants and animals on and in the vicinity of the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are so noted.

Table 3.4-2
GRANT COUNTY FEDERAL AND STATE-LISTED PLANTS

Common Name	Scientific Name	State Status	Federal Status	Habitat[1]	Potential to Occur on Site
Great Basin gilia	*Aliciella leptomeria*	T	--	Open semiarid habitat	Yes – suitable habitat
Grand redstem	*Ammannia robusta*	T	---	Shoreline and islands along Columbia River	No
Wormskiold's northern wormwood	*Artemisia campestris var. wormskioldii*	E	C	Shrub-steppe	Yes – suitable habitat
Palouse milk-vetch	*Astragalus arrectus*	T	---	Grassy hillsides, sagebrush flats, river bluffs	Yes – suitable habitat
Geyer's milk-vetch	*Astragalus geyeri var. geyeri*	T	---	Depressions in mobile or stabilized dunes, sandy flats and valley floors	No
White eatonella	*Eatonella nivea*	T	---	Shrub steppe	Yes – suitable habitat
Halfchaff awned sedge	*Lipocarpha aristulata*	T	---	Wet areas in bottomlands, sandbars, beaches, shorelines, stream banks, ponds and ditches	No
Red poverty-weed	*Micromonolepis pusilla*	T	---	Desert regions in saline or alkaline clay soils	No
Nuttall's sandwort	*Minuartia nuttallii var. fragilis*	T	---	Open gravelly benches, dry rocky areas or limestone talus from open sagebrush hills to alpine slopes	No
Wanapum crazyweed	*Oxytropis campestris var. wanapum*	E	SoC	Open grassland/ shrubland	Yes – suitable habitat
Fremont's combleaf	*Polyctenium fremontii*	T	---	Sagebrush deserts with gravelly clay, damp or wet meadows, shallow ponds, stony swales, dried vernal pools and banks of vernal streamlets	No
Austin's knotweed	*Polygonum austiniae*	T	---	Dry to moist flats or banks, from sagebrush plains to lower mountains, often with ponderosa pine	Yes – suitable habitat

Table 3.4-2 Continued

Common Name	Scientific Name	State Status	Federal Status	Habitat[1]	Potential to Occur on Site
Persistent-sepal yellowcress	*Rorippa columbiae*	T	SoC	Riverbanks, permanent lakes, snow-fed lakes and streams, internally drained lakes with extended periods of dryness, wet meadows and ditches	No
Lowland toothcup	*Rotala ramosior*	T	---	Damp areas in fine sand and silt, wet swampy places, mudflats, lake and pond margins, and along free-flowing river reaches	No
Ute ladies'-tresses*	*Spiranthes diluvialis*	E	T	Intermontane valley plains in moist meadows associated with perennial streams, floodplains and oxbows	No

Source: GeoEngineers, 2015.

Note:

1. Plant habitat characteristics comes from the Washington Natural Heritage Information System (2014b); available at: http://www1.dnr.wa.gov/nhp/refdesk/lists/plantsxco/grant.html

* Ute ladies'-tresses was not included in the Natural Heritage Program database, but is listed by USFWS to potentially occur in Grant County.

E = Endangered. In danger of becoming extinct or extirpated from Washington.

T = Threatened. Likely to become Endangered in Washington.

C = Candidate Species. Sufficient information exists to support listing as Endangered or Threatened.

SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.

Alternatives 1 and 2

Construction

Short-term impacts to animals and plants could result from construction activities associated with the *GCIA Employment Center*. Noise associated with construction activities could result in short-term avoidance of the project site and vicinity by wildlife species. While small mammals would likely avoid construction areas, increased noise levels during construction would likely temporarily disturb or alter migration patterns of larger mammals. Construction noise could temporarily disrupt feeding and migration and result in short-term avoidance by bird species. Increased noise levels during construction could temporarily disrupt foraging, nesting, calling and flight behavior of birds on and in the vicinity of the site. Urban-adapted birds are more tolerant of disturbance, but those that are habitat and territory specific could handle the displacement with difficulty when searching for suitable habitat in otherwise claimed territories. During breeding season, there is more of a potential for permanent loss of species. However these potential construction impacts to wildlife would be temporary, highly localized and would cease once construction is complete.

Since there are no surface water resources within the project site, and the closest off-site resource (Crab Creek) is approximately 0.5 miles from the site, there is likely no potential for discharge of stormwater and its associated impacts to aquatic habitat and species during construction of the project. Temporary erosion and sedimentation control and Best Management Practices (BMPs) would be implemented per Grant County and City of Moses Lake requirements. Therefore, no significant short-term impacts to surface waters and associated aquatic habitat and species would be expected under Alternatives 1 and 2.

Operation

Long-term impacts to animals and plants would result from operational activities associated with the *GCIA Employment Center*, including direct and indirect effects. Alternatives 1 and 2 would likely cause direct impacts such as an increase in noise and human presence and a loss of shrub-steppe and grassland habitat. There could also be indirect effects such as changing predator/prey relationships (e.g., if the project causes prey species such as squirrels to avoid the project site, then predator species such as owls and hawks might avoid the site as well). These changes have the potential to impact plant and wildlife species that could be present within the site.

Proposed development under Alternatives 1 and 2 would result in a loss of suitable habitat for numerous plant and wildlife species. It is expected that Alternative 1 would result in more habitat loss than Alternative 2 because there would be more impervious surfaces (approximately 1,084 acres of impervious surfaces under Alternative 1 versus 1,007 acres of impervious surfaces under Alternative 2). However, development under both alternatives would cause loss of suitable habitat for plants and wildlife and could impact the presence of these species onsite. The rare plants listed above are only found in habitats similar to the project site (shrub-steppe and grasslands). Reduction in suitable habitat could result in the loss of individual plants of these species. Wildlife that is territory-specific could handle displacement with difficulty when searching for suitable habitat in otherwise claimed territories and potentially result in permanent loss of individuals of these species. In addition, development under Alternatives 1 and 2 could result in a loss of breeding habitat within the project site. During breeding season, there is a higher potential for permanent loss of these species.

During operational phases of the *GCIA Employment Center* project, it is expected that noise levels would increase under Alternatives 1 and 2 due to additional automobiles and trucks that would travel through the site on a daily basis. Alternative 2 would result in greater noise impacts than Alternative 1, as this alternative would generate more employees and associated traffic than Alternative 1. In addition to noise, development of new aerospace and manufacturing uses in the *GCIA Employment Center* would increase light and human presence within the site. These operational effects would likely cause wildlife species to avoid the area. Avoidance has the potential to result in the permanent loss of species, especially if the area is used for breeding and nesting.

Alternatives 1 and 2 would have the potential to permanently impact plant and wildlife numbers within the project site. At the time of development applications, plant and wildlife surveys should be conducted, as required by local and state authorities, to determine if any of these rare plant species or listed wildlife species occur within the specific project area proposed for development. If they do, appropriate mitigation measures should be identified and implemented.

Since there are no surface water resources within the project site, and the closest off-site resource is approximately 0.5 miles from the site, there is likely no potential for discharge of stormwater and its associated impacts to aquatic habitat and species during operation of the project. A permanent stormwater control system(s) would be implemented per Grant County and City of Moses Lake stormwater requirements to prevent erosion, sedimentation and pollutant impacts on surface waters. Therefore, no long-term impacts to surface waters and associated aquatic habitat and species would be expected under Alternatives 1 and 2.

Alternative 3

Under Alternative 3, the No Action Alternative, it is assumed no new development or infrastructure improvements would occur at this time. The site would remain in its partially developed condition, and there would be no new temporary or permanent impacts to existing plant and animal habitats and species. Existing habitats that are intact would remain intact. Human activity onsite and its potential to impact animals would remain substantially unchanged.

3.4.3 Mitigation Measures

The following required/proposed mitigation measures address the potential impacts to plants and animals that could result from the construction and long-term use of Alternative 1 or 2.

Required/Proposed Mitigation Measures

Prior to and During Construction

- Future development would be subject to Grant County and City of Moses Lake regulations at the time of permit issuance. Additional site-specific critical area studies could be required to evaluate potential impacts and identify required mitigation.
- TESC and BMPs would be implemented to control stormwater runoff during construction to prevent erosion, sedimentation and pollutant impacts on off-site water resources and associated impacts on aquatic habitat and species.
- Burrowing owl nesting surveys would be conducted to determine the presence of these species within the specific site area at the time of development applications.
- Work would be restricted within 0.5 mile of active burrowing owl nests.
- Plant surveys should be conducted to determine the presence of the rare plant species within specific site areas at the time of development applications.

- Landscaping would be included in proposed development that would meet or exceed Grant County and City of Moses Lake landscaping requirements. If native plant species are used, this would serve to replace a portion of the habitat for wildlife species onsite.
- If impacts to priority plant and wildlife species are unavoidable, appropriate mitigation measures would be implemented as needed. Currently, there is a burrowing owl mitigation site that was constructed for another project within the vicinity of the site. Appropriate mitigation for burrowing owls could include expanding this mitigation area or identifying another appropriate mitigation area.
- Specific project design would respond to guidance from WDFW on Priority Habitats and Species Management Recommendations, Grant County, the City of Moses Lake and the Port of Moses Lake for species that are determined to be at the project site.

During Operation

- A permanent stormwater control system would be installed to prevent long-term erosion, sedimentation and pollutant impacts on off-site water resources and associated impacts on aquatic habitat and species.

3.4.4 Significant Unavoidable Adverse Impacts

Project development under both Alternatives 1 and 2 would result in the permanent loss of suitable habitat for sagebrush steppe dependent species and, potentially, the loss of occupied habitat and individuals within the population, if present during construction. However, no significant unavoidable adverse impacts on plants and animals are anticipated with implementation of the mitigation measures listed above.

3.5 ENVIRONMENTAL HEALTH

This section of the DEIS describes the existing environmental health-related conditions on and in the vicinity of the *GCIA Employment Center* site. It provides a summary of the ongoing site remediation and cleanup process overseen by the U.S. Environmental Protection Agency (EPA) in the area. Potential impacts from development of the EIS alternatives are evaluated and mitigation measures identified.

3.5.1 Affected Environment

Site History

Larson Air Force Base

In 1942, the federal government opened the Moses Lake Army Air Base on approximately 10,000 acres of land, including the *GCIA Employment Center* site. The base was used for training P-38 pilots and later B-17 Flying Fortress crews. After World War II ended in 1945, the base briefly closed, but in 1948 was reopened as a U.S. Air Force Base. In 1950, the facility was renamed Larson Air Force Base (AFB). Larson AFB continued to grow through the 1950s adding a troop carrier wing and an air transportation operation. The base became a test flight center for the Boeing Company. Base activities from the 1940s through the 1960s were generally associated with aircraft and military operations, including fueling, wastewater treatment and disposal, weapons storage and training exercises. In 1964, it was announced that the Air Force would be closing the base in 1966. In 1965, the Grant County commissioners established the Grant County Port District No. 10 -- the Port of Moses Lake -- and the Larson AFB was renamed "The Grant County International Airport". The airport continued to be a major flight crew training facility for Japan Airlines and other airlines worldwide, and a flight testing facility for the Boeing Company and other airframe manufacturers. The remaining portions of the base were either sold to the Boeing Company or other private individuals, or deeded to other governmental agencies, including Big Bend Community College, Colombia Basin Job Corp and other county and city agencies. A number of aerospace and industrial operations have more recently located in proximity to the airport (see Section 3.9, **Historic and Cultural Resources**, and **Appendix H** for details).

Some aircraft operations and activities associated with the aircraft industry at Larson AFB resulted in the contamination of groundwater and soil on site. It is believed that TCE, a hazardous substance, was used in several aircraft maintenance activities on site, including degreasing of parts, aircraft body cleaning and as a general solvent. TCE was also used and disposed of in aircraft hangers, an aircraft wash rack facility and facilities associated with missile assembly, including a facility where a TCE dip tank may have been used. TCE used within the hangers may have been drained periodically and discharged to soil, or put in drums for disposal in general purpose landfills. At the wash rack area, TCE was likely mixed with water and discharged directly onto the soil. In addition, several potentially hazardous substances, including lead, polychlorinated biphenyls (PCBs), arsenic, mercury and petroleum products may have been disposed of in general purpose landfills on the site.[1]

Gun Club

A Gun Club was located in the eastern portion of the site on property owned by the City of Moses Lake. This facility was used for target practice by the City of Moses Lake Police Department. In 2010, operation of this club ceased. Lead is frequently deposited at gun clubs/shooting ranges as spent lead shot (pellets) at clay target shooting ranges and spent lead bullets in soil berms at rifle/pistol shooting ranges; this contaminant is likely present in this portion of the site. Lead is not insoluble in the soil environment, but is readily released in a soluble form. Lead is known to pose environmental and human health risks.

Site Remediation and Cleanup Process

Larson Air Force Base

As noted above, Larson AFB and industrial aviation activities from the 1940s through the 1960s resulted in the contamination of groundwater and soils with TCE. TCE is considered highly likely to pose a risk to human health by the EPA.[2] Disposal of hazardous substances (e.g., lead, PCBs, arsenic, mercury and petroleum products) in general purpose landfills is also believed to have occurred at the site and may pose a risk to human health. These hazardous substances in former landfill areas may provide a source for groundwater contamination and could result in impacts to human health if soil was disturbed for site use or development.[3]

In 1988, Washington State Department of Social and Health Services found TCE levels above EPA's primary drinking-water standards under the federal Safe Drinking Water Act Maximum Contaminant Level (MCL) in three City of Moses Lake supply wells on the former Larson AFB. They also discovered a contaminated supply well south of the former base site in the Skyline Water System. The City of Moses Lake fixed the city wells by sealing off the contaminated aquifer zones and a new water system was created for the Skyline community.[4]

EPA has assumed the role of lead agency for cleanup/remediation of portions of the *GCIA Employment Center* site and vicinity, and in 1992, the Moses Lake Wellfield Contamination Superfund[5] Site was added to the National Priorities List (NPL). The NPL is a list of the most

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[1] EPA, 2008b. *EPA Proposed Plan for the Moses Lake Wellfield Contamination Superfund Site.* January.
[2] EPA, 2008b.
[3] EPA, 2008b.
[4] EPA, 2014. *Groundwater and Soil Cleanup Continues, Moses Lake, Washington.* Summer 2014.
[5] Superfund is the name given to the federal environmental program established to address sites requiring cleanup under Federal law. It is also the name of the fund established by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended that can be used by EPA to perform site cleanup work. The Superfund program allows the EPA to compel responsible parties to perform cleanups or to perform cleanups itself and then seek reimbursement from responsible parties for EPA's cleanup costs.

serious uncontrolled or abandoned hazardous waste sites that are identified for potential cleanup under the national Superfund program. Since 1992, the U.S. Army Corps of Engineers (Corps) has worked on behalf of the potentially responsible parties (PRPs) to characterize the site through a Remedial Investigation/Feasibility Study (RI/FS). The RI/FS was intended to comprehensively evaluate environmental conditions at the site and review various remediation options from which the EPA could chose a preferred cleanup remedy. In 2007, the RI/FS was completed and in 2008 the study was released as part of the *Proposed Plan for the Moses Lake Wellhead Contamination Superfund Site*.[6] The RI/FS report identified several TCE groundwater plumes and multiple areas of soil contamination. **Figure 3.5-1** shows the extent of soil and groundwater contamination at the Moses Lake Wellhead Superfund Site.

In September 2008, an interim Record of Decision (ROD) was released. A ROD is a public document that explains which cleanup alternatives will be used to clean up a Superfund site. In 2008, EPA also issued a Final Interim Cleanup Plan, and in 2010 the EPA and the Corps signed a cleanup settlement with Boeing, Lockheed Martin and the City of Moses Lake.

Based on the RI/FS, there are five groundwater plumes contaminated with TCE at the Moses Lake Wellfield Superfund Site. Two shallow basalt groundwater plumes at the former Larson AFB site have spread over a mile to the south (see **Figure 3.5-1**). Active remediation efforts are being phased, starting with these two plumes. This includes characterization, monitoring and institutional controls for all five plumes (institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy).[7] In the summer and fall of 2014, monitoring and extraction wells were installed on the first, southernmost plume, and a treatment system is anticipated to be operational by the end of 2015. Cleanup activities for the second plume have not yet begun.

There are 12 locations of soil contamination on the former Larson AFB site that contain toxic metals, petroleum products, PCBs and possibly TCE. Two locations were selected for initial cleanup as these sites pose the greatest environmental risk.[8] At one of these two sites, the Paint Hanger Leach Pit (Site 22), soil testing showed that the site meets EPA levels for industrial areas. EPA has tested soils and groundwater at the other site (Site 20) and excavation was anticipated to begin in 2014 or 2015 (see **Figure 3.5-1** for the location of these sites). The other ten possible soil contamination locations are in the process of being evaluated to determine the order of cleanup.[9]

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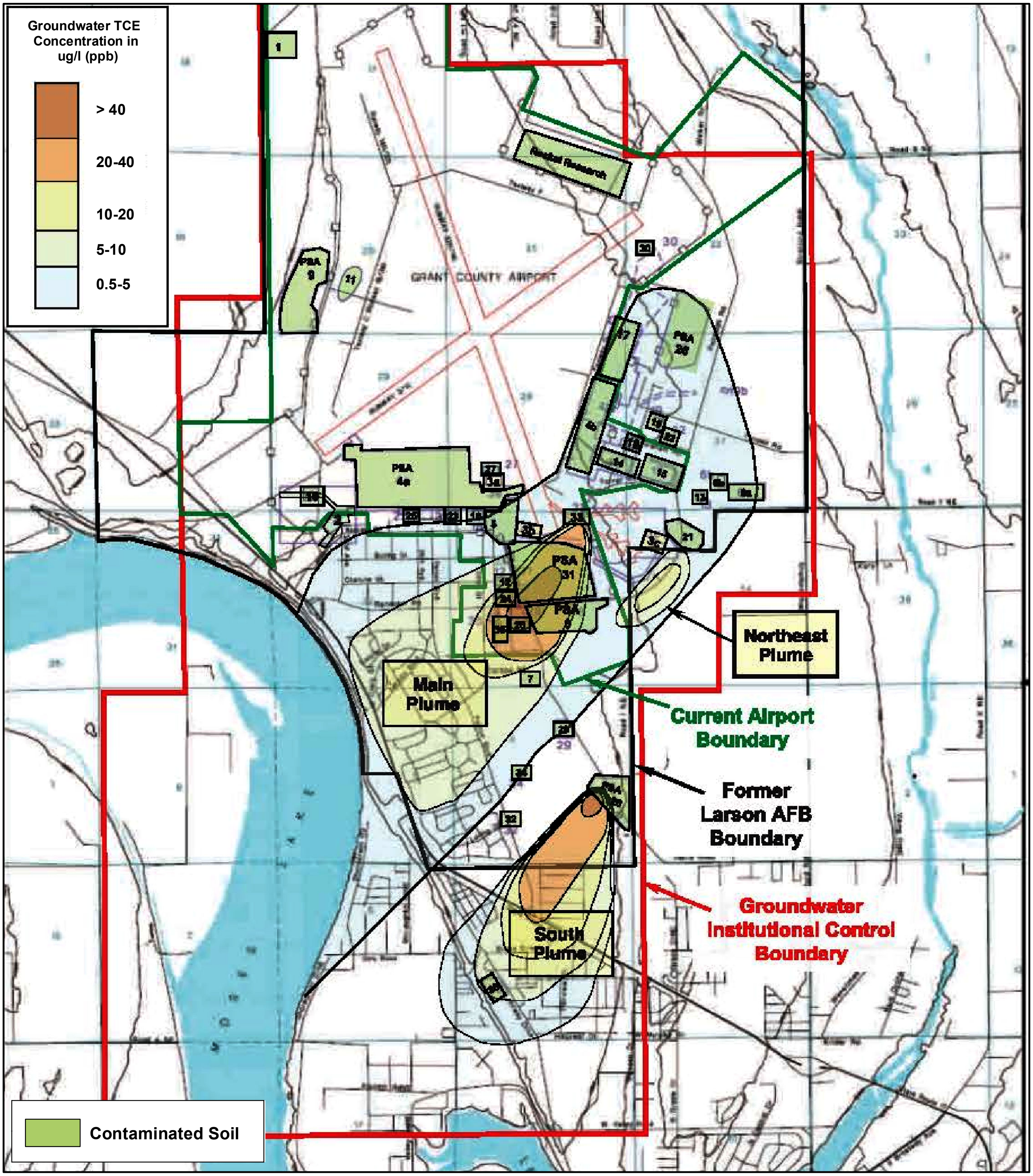
[6] EPA 2008a
[7] EPA 2008a
[8] EPA 2014
[9] EPA. 2014



Source: Interim ROD, Moses Lake, WA, 2008.

EA Engineering, Science, and Technology, Inc., PBC

Not to Scale

Figure 3.5-1
Moses Lake Wellfield Superfund Site

Extent of Contamination on the Site

Larson Air Force Base

Soil

During the RI/FS, 39 soil sites were identified that required characterization. Of these sites, 27 were eliminated from further consideration, one site requires cleanup and 11 sites were suspected as having contamination levels requiring cleanup. Within the boundaries of the *GCIA Employment Center*, most identified soil contamination sites were eliminated from further consideration. The following areas of contaminated soil are located directly adjacent to the project site or could be partially located within the site boundary (see **Figure 3.5-1** for the approximate locations of the contaminated sites).

- **Site 3c** (former Aircraft Wash Rack) – this site is within a contaminated soil area proposed for remediation activities. In this area, aircrafts were washed with TCE, and wash runoff liquids were discharged directly to the surrounding soils, introducing the possibility of TCE contamination. This site requires further characterization to understand the extent of the possible contamination.

- **Site 19** (former Liquid Oxygen [LOX] Plant) – this is a site that was used for the handling of LOX used in the Base's missile program. TCE was reportedly used in large quantities at this site to clean metal surfaces before coming into contact with LOX. Other hazardous substances discharged at the site include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and Total Petroleum Hydrocarbons (TPH). Sump pumps and the associated piping that contained TCE-contaminated water was removed by the Corps. After the removal of the sumps, levels of soil gas declined. Further investigation is needed at the site.

- **Site 22** (former Paint Hangar Leach Pit) – this site was designed to capture the wastewater and waste chemicals from the Paint Hangar operations, and runoff from the refueling area. Hazardous materials that may have been discharged into the pit include metals (arsenic, copper, lead, mercury and nickel), gasoline, diesel, oil, TPH and PCBs. Soil sampling at this site found levels of lead exceeding EPA screening levels and high PCB levels.

- **Site 33** (landfill at the end of Runway 32) – this site was previously used as a dump for unknown liquids from tanker trucks, as well as a more general disposal area. The TCE groundwater plume appears to begin at this site, and further characterization is needed to determine if cleanup is required.

Groundwater

At the Moses Lake Wellfield Superfund site, TCE was detected in three groundwater areas (5 plumes), representing approximately 1,000 acres of contaminated groundwater. During the RI/FS, no source of TCE was identified for soil disposal sites, but it was determined that one soil contamination site may be a source for the south groundwater plume. The *GCIA Employment Center* site is located within the area of the Main and Northeast Plume (see **Figure 3.5-1**). Most of the proposed site has TCE contaminated groundwater, with concentration between 0.5 and 5 ug/l (parts per billion). The proposed site is also within or in proximity to higher concentrations of TCE.[10]

The Remedial Action Objectives (RAOs) proposed in the *Moses Lake Wellfield Cleanup Interim Record of Decision (ROD)* are based on the assumption that lands within the airport and to the east of the airport are industrially zoned and would remain so for the current and reasonably foreseeable future. As such, the RAOs suggested that the Moses Lake Wellfield Superfund site cleanup levels be based on industrial exposure levels.[11]

Gun Club Vicinity

Three limited Environmental Site Assessments (ESAs) were prepared for the eastern portion of the site in 1997, 2004 and 2010. The 1997 Limited ESA included site reconnaissance and soil sampling in areas of concern on the Bodie Parcel. Nine soil samples were collected, including east of the former Gun Club and in a drainage trench located south of the Gun Club crossing Randolf Road. Arsenic, barium, chromium, lead, mercury and TPH were detected in the soil samples at levels below Washington Model Toxics Control Act (MTCA) residential cleanup levels. Cadmium was detected at levels above both residential and industrial cleanup levels in the drainage trench. The former LOX disposal site located south of the Gun Club and former base dump site located between Tyndall Road and 7 Road NE were also monitored and were noted to have the potential for environmental impacts.[12] In 2004 and 2010, Phase I ESAs were completed on the ASPI Industrial Park Parcels, which represented a smaller portion of the original 1997 study area. No adverse environmental effects were determined on the parcel, which included a smaller portion of the Bodie Parcel.[13]

3.5.2 Impacts of the Alternatives

This section identifies and analyzes environmental health-related impacts on and in the vicinity of the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are so noted.

Alternatives 1 and 2

Prior to the development under Alternatives 1 and 2, the proposed site area will undergo phased cleanup and remediation under the oversight of the EPA. Soil cleanup standards will

[10] EPA 2008a
[11] EPA 2008a
[12] Dames & Moore 1997
[13] URS. 2010. *Phase I Environmental Site Assessment, ASPI Industrial Park Parcels, Tyndall & Stratford Roads Moses Lake, Washington*. February 24.

be based on, and in compliance with, the Washington MTCA requirements (WAC 173-340-745) with the exception of PCB. PCB cleanup efforts will strive to be done in compliance with the Toxic Substances Control Act (TSCA). Where soil cleanup levels are based on standards for industrial areas, it is required that institutional controls remain to ensure this type of land use is maintained. If land use changes occur, additional cleanup or a change in the cleanup remedy may be required. Under both Alternatives 1 and 2, portions of the *GCIA Employment Center* site would remain zoned for industrial uses, and would be developed accordingly.

It is assumed that where development is proposed in areas with contamination, cleanup would be completed to the levels required under all federal, state and local regulations and requirements, and would be completed in accordance with all applicable procedures and RAOs.

Construction

At build-out under Alternative 1, approximately 86 percent of the site would be covered with impervious surfaces and 8,809,647 square feet of new building area would be developed. At build-out under Alternative 2, approximately 80 percent of the site would be covered with impervious surfaces and 10,085,324 square feet of new building area would be developed. A total of approximately 2,731,640 cubic yards of cut and fill would be required for site grading activities under both alternatives. Potential environmental health-related impacts during construction of utility infrastructure and buildings on the *GCIA Employment Center* site are described below.

Soil and Groundwater

- **Soil Management** – Site grading, construction of infrastructure and building development on the site could disturb or generate contaminated soils from within the site. For example, excavation of soils would be required to install building foundation systems or other subsurface structures. Improper management of these materials (e.g., shipment of contaminated soils to a non-permitted off-site disposal area) could result in exposure of human health or environmental receptors to hazardous substances. These potential exposure pathways would be addressed by complying with the soil management provisions of the institutional controls, and ensuring compliance of all future site construction activities with these control measures. Such measures would provide for testing, segregation, and proper on-site or off-site management of affected materials.
- **Worker Health & Safety** – State and federal worker safety regulations require special training, monitoring and work practices at cleanup sites. Subsurface construction activities (e.g., trenching or excavation for installation of building foundation structures) in some areas of the site following cleanup/remediation could result in exposure of workers to contaminated soils or soil vapors that may require such training, monitoring and/or special work practices. Complying with applicable construction worker safety protocols defined as part of the site's

institutional control plans, and compliance of all construction activities with these control measures would address these health and safety issues.

- **Stormwater Quality Impacts** – If construction activities disturb contaminated soils, pollutants could enter site stormwater runoff. These impacts would be addressed by maintaining cover soil over contaminated soils where practicable, and/or by implementing stormwater treatment and monitoring during any construction activities that would disturb contaminated soils.

- **Groundwater Quality** – If necessary, cleanup activities at the site could potentially include various activities to contain, treat, divert and/or monitor groundwater in order to comply with applicable cleanup levels and associated requirements. Site construction activities could potentially interfere with these cleanup actions by modifying groundwater flow patterns (e.g., installing deep basement drains that re-direct groundwater flows), damaging groundwater monitoring equipment (e.g., damaging a monitoring well during roadway construction) or by introducing new land uses that are inconsistent with the site cleanup plans and institutional control measures. These concerns would be addressed by ensuring compliance with the site-specific institutional control plans during all site cleanup and development construction activities.

- **Facility/Land Use Siting** – As part of the final cleanup plans for the Moses Lake Wellfield Superfund site, some development land uses could be relocated or restricted in certain portions of the *GCIA Employment Center* site. For example, Ecology or EPA may specify that subsurface utility excavation and construction is restricted where certain contaminated soils are to be treated and/or contained in place. Improper siting of infrastructure or development features in such restricted areas could result in non-compliance with site cleanup requirements. A review of use restrictions associated with institutional control plans would be incorporated as part of the construction and building permit review process, and all proposed uses would comply with these use restrictions. If any proposed uses conflict with site cleanup requirements due to the presence of contained hazardous materials, this conflict would be addressed either through modification of the specific development plan, or through implementation of additional removals of the contained hazardous materials in coordination with state and federal agencies.

- **Discovery of New Cleanup Issues** – It is possible that previously-undocumented environmental contamination problems could exist at the *GCIA Employment Center* site. Should such contamination be discovered during design or construction activities, potential environmental health issues and hazardous materials concerns would be addressed by complying with release reporting, investigation and cleanup provisions of applicable regulations.

Operation

Potential environmental health-related impacts could occur after completion of site construction, during the operation of industrial facilities at the site. These potential operational impacts could include the following:

- **Soil Management and Worker Safety** – During maintenance and repair of subsurface utilities, soil management and worker safety requirements could be triggered similar to those associated with construction activities – and discussed above. These impacts would largely be mitigated through initial development of utility corridors in clean backfill material, where practicable. This practice would allow future utility maintenance work to be conducted without requiring special soil management or worker safety provisions. Where this is not practical, similar soil management and worker safety provisions applicable to construction activities (e.g., compliance with worker training, monitoring and work practice requirements defined in site institutional control plans) would apply to utility maintenance or other subsurface maintenance activities.

- **Vapor Intrusion** – There is a potential for volatiles to be present in the subsurface soil that could generate vapors that could intrude into utility trenches and above-grade structures. This could occur if the planned RAOs included leaving contaminated soil, groundwater and sediments in place beneath proposed development in certain development scenarios. If not addressed by the development design, these vapors could pose a potential risk to human health. Separation of working areas from the contaminants and the implementation of potential institutional control measures would ensure that future building occupants would not be exposed to unacceptable vapors accumulating within buildings or utility corridors from contaminated soil and groundwater.

- **Future Hazardous Materials Use** – Industrial, manufacturing and warehouse uses at the *GCIA Employment Center* could require storage and/or processing of hazardous materials as part of normal operations. This could result in impacts to the environment if these chemicals are not properly stored, used or disposed. This potential risk would be addressed by compliance with local (e.g., fire department hazardous materials regulations), state (e.g., State of Washington underground storage tank regulations) and federal regulations (e.g., federal spill prevention control and counter-measures requirements) relating to the use, storage and/or processing of hazardous materials.

Alternative 3

Under Alternative 3, the No Action Alternative, it is assumed no new development or infrastructure improvements would occur on the *GCIA Employment Center* site at this time. The site would remain in its partially developed condition, and there would be no new temporary or permanent environmental health-related impacts.

Cleanup of contaminated soil and groundwater sites at the Moses Lake Wellfield Superfund Site by EPA would continue as outlined in the *Moses Lake Wellfield Cleanup Interim ROD.*[14] Once cleanup of the site is complete, the site will remain in a post-remediation condition. The goals of the RAOs would determine the final cleanup actions and objectives of the site. These remediation features would likely prevent direct contact with contaminants and address the potential migration of the contaminated groundwater plumes.

3.5.3 Mitigation Measures

The following required/proposed mitigation measures would address the potential environmental health-related impacts that could result from the construction and long-term operation of Alternative 1 or 2.

Required/Proposed Mitigation Measures

<u>Prior to and During Construction</u>

- **Soil Management** – Compliance with the soil management provisions of site institutional controls would be ensured, and compliance of all future site construction activities with these control measures would be ensured as well.
- **Worker Health & Safety** – Compliance with construction worker safety protocols defined as part of site's institutional controls would be ensured, and compliance of all future site construction activities with these control measures would be ensured as well.
- **Stormwater Quality Impacts** – Cover soil would be maintained over contaminated soils where practicable, and/or stormwater treatment and monitoring during construction activities that could disturb contaminated soils would be implemented.
- **Groundwater Quality** – Compliance with the site-specific institutional controls during site cleanup and development construction activities would be ensured.
- **Facility/Land Use Siting** – A review of use restrictions associated with institutional control plans would be incorporated as part of future building permit reviews, and either: 1) would ensure that all proposed uses comply with these use restrictions, or 2) would require conducting additional removals of the contained hazardous materials in coordination with local, state and federal agencies, as necessary, to remove the use restrictions.
- **Discovery of New Cleanup Issues** – Compliance with release reporting, investigation and applicable cleanup provisions of the applicable regulations would be ensured.

[14] EPA 2008a

During Operation

- **Soil Management and Worker Safety** – Utility corridors would initially be developed in clean backfill material where practicable. Where this is not practicable, the same soil management and worker safety provisions applicable to construction activities (e.g., compliance with worker training, monitoring and work practice requirements defined in site institutional control plans) would apply to utility maintenance or other subsurface maintenance activities.

- **Future Hazardous Materials Use** – The use, storage and/or processing of hazardous materials would comply with local (e.g., fire department hazardous materials regulations), state (e.g., Washington underground storage tank regulations) and federal regulations (e.g., federal spill prevention control and counter-measures requirements) relating to the use, storage or processing of hazardous materials.

3.5.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse environmental health-related impacts are anticipated with implementation of the mitigation measures listed above.

3.6 NOISE

This section of the DEIS describes the noise conditions on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the EIS alternatives are evaluated and mitigation measures identified. This section is based on the *Noise Report* (May 2015) prepared by Landau Associates (see **Appendix G**).

Noise conditions are analyzed both programmatically and semi-quantitatively using screening-level modeling and other readily available noise data. Details about the basic methodology, equipment and modeling tools used to develop this analysis are provided in **Appendix G**.

3.6.1 Affected Environment

Currently, the site consists of mostly undeveloped land with industrial and airport zoning adjacent to the airport. The airport has historically produced noise associated with jet takeoff, landing and taxiing, as well as maintenance operations. Traffic noise is currently produced from Stratford Road NE, Randolph Road NE, Road 7 NE and State Route (SR) 17, in addition to other local streets in the site vicinity.

Basic Principles of Noise

In order to assess existing noise conditions and potential noise impacts in the site vicinity, it is beneficial to understand basic noise principles, as well as the regulatory background for noise-related issues. Below are brief definitions of basic noise-related terminology used in this section:

- **Sound** - A vibratory disturbance transmitted by pressure waves through a medium (e.g., air, water and solids) and capable of being detected by a receiving mechanism, such as the human ear or a microphone
- **Noise** - Sound that is loud, unpleasant, unexpected or otherwise undesirable.
- **Decibel (dB)** - A measure of sound intensity based on a logarithmic scale that indicates the squared ratio of actual sound pressure level to a reference sound pressure level of 20 micropascals.
- **A-weighted decibel [dB(A)]** - A measure of sound intensity that is weighted to account for the varying sensitivity of the human ear to different sound frequencies. Typical A-weighted noise levels for various types of sound sources are summarized in **Table 3.6-1**.
- **Equivalent sound level (Leq)** - A measure used to represent the average sound energy occurring over a specified time period. Leq is the steady-state sound level that would contain the same acoustical energy as the time-varying sound that actually occurs during the monitoring period. The 1-hour A-weighted equivalent

sound level (Leq 1 h) is the energy average of A-weighted sound levels occurring during a 1-hour period.

- **Day-night average sound level (DNL)** - A measure used to represent the average sound energy occurring over a 24-hour time period, with a 10 dB penalty assigned for noise occurring at night.

The human ear generally perceives an increase in noise of 10 dB(A) as a doubling of loudness and generally cannot detect differences of 1 to 2 dB(A) between noise levels of a similar nature. Under ideal listening conditions, some people can detect differences of 2 or 3 dB(A), but under normal listening conditions, a 5-dB(A) change in sound level of a similar nature is typically detectable. However, when an intruding sound is of a different nature from background (e.g., a backup alarm in an otherwise quiet neighborhood), most people can discern a new type of noise even if it only increases the overall Leq by less than 1 dB(A). **Table 3.6-1** identifies sound levels of typical noise sources and activities.

Table 3.6-1
TYPICAL A-WEIGHTED SOUND LEVELS

Sound Source	Decibels (A-weighted)	Typical Response
Carrier deck jet operation	140	Limit amplified speech
Limit of amplified speech	130	Painfully loud
Jet takeoff [200 feet (ft)] Auto horn (3 ft)	120	Threshold of feeling and pain
Jet takeoff (2,000 ft)	110	--
Shout (0.5 ft)	100	Very annoying
Heavy truck (50 ft)	90	Hearing damage
Passenger train (100 ft) Freight train (50 ft)	80	Annoying
Freeway traffic (50 ft)	70	Intrusive
Light auto traffic (50 ft)	60	--
Normal speech (15 ft)	50	Quiet
Living Room Library	40	--
Soft whisper (15 ft)	30	Very quiet
Broadcasting studio	20	--
	10	Just audible
	0	Threshold of hearing

Source: Federal Transit Administration 2006.

Regulatory Context

Local, state and federal governments and agencies have established noise standards and guidelines to protect citizens from adverse effects associated with noise. The guidelines and regulations that relate to the *GCIA Employment Center* are discussed below.

City of Moses Lake Noise Regulations

Chapter 8.28 of the City of Moses Lake Municipal Code (MLC) establishes regulations to minimize the exposure of citizens to excessive noise. The MLC states that certain noise-producing activities are prohibited and also lists exempt activities. The City does not have regulations for traffic noise.

The MLC prohibits sounds originating from construction activity between the hours of 10:00 PM and 7:00 AM, unless otherwise approved by the City Council.

Chapter 18.40 of the MLC establishes permissible noise levels from industrial noise sources at receiving residential properties. The maximum permissible environmental noise levels from noise sources in industrial zones at receiving residential properties are 60 dB(A) during daytime hours (7 AM to 10 PM) and 50 dB(A) during nighttime hours (10 PM to 7 AM).

Grant County Noise Regulations

Grant County Code (GCC), Chapter 6.24 establishes regulations related to noise and noise-producing activities. The GCC specifies prohibited noise-producing activities and exemptions, but does not specify permissible noise levels. The County does not regulate noise from traffic or temporary construction.

GCC Chapters 22 through 25, also provides regulations for noise related to development but generally references the maximum permissible noise levels established in Chapter 173-60 of the Washington Administrative Code (WAC).

State Noise Control Act of 1974

WAC 173-60-040 establishes maximum permissible noise levels for various environments. Industrial operations and construction activities are subject to these provisions. Industrial facilities are considered Class C facilities, and residences are considered Class A facilities under WAC 173-60-030. According to WAC 173-60-040, noise produced by a Class C facility may not exceed 60 dB(A) at Class A facilities.

State of Washington State Department of Transportation Traffic Noise Regulations

It is not anticipated that assumed development under the EIS alternatives would include Washington State Department of Transportation (WSDOT) funding and would not be subject to WSDOT noise regulations. However, if future roadway improvements receive WSDOT funding, those improvements would need to comply with WSDOT noise standards.

WSDOT has adopted the Federal Highway Administration (FHWA) noise abatement criteria (NAC) for evaluating noise impacts and for determining if such impacts are sufficient to justify funding of noise abatement for new roadway construction and roadway widening projects with state funding. The WSDOT traffic noise policy (see **Appendix G**) meets the federal requirements of Title 23, Part 772 of the Code of Federal Regulations (CFR), so compliance with the WSDOT traffic noise policy will meet FHWA noise requirements. For WSDOT-funded roadway projects, a noise impact occurs when a predicted traffic noise level under the design year conditions approaches within 1 dB(A) of the FHWA NAC [for example, WSDOT defines a traffic noise impact at a dwelling to be 66 dB(A) or higher]. In addition, WSDOT defines a traffic noise impact to occur when the predicted traffic noise level substantially exceeds the existing noise level. A 10-dB(A) increase over existing noise levels is considered a substantial increase by WSDOT. Even without WSDOT funding, the established WSDOT guidelines offer a reasonable measure of impacts and for this analysis, predicted traffic noise level increase of 10 dB(A) or above is considered a significant impact.

Methodology

The study area used to evaluate noise impacts consists of the approximately 1,200-acre *GCIA Employment Center* site; the agricultural, industrial and commercial lands in the site vicinity, including several representative noise-sensitive receivers that could potentially be impacted by noise associated with assumed development under the EIS alternatives. The noise analysis evaluates existing and future noise levels at the following representative noise-sensitive receivers (see **Figure 3.6-1** for a mapping of the receiver locations):

- Existing rural residences along Stratford Road NE, north of Tyndall Road NE (Receiver R-1)
- Existing rural residences along Stratford Road NE, south of Road 7 NE (Receiver R-2)
- Existing residential development in the Longview neighborhood, along Stratford Road NE, north of SR 17 (Receiver R-3)
    - This receiver is also representative of other noise-sensitive receptors along Stratford Road NE, such as Longview Elementary School
- The Endeavor Middle School, located on Randolph Road NE (Receiver R-4)
- Existing rural residences along Road 7 NE (Receiver R-5)
- Existing residential development east of SR 17, between the Randolph Road exit and Stratford Road NE exit (Receiver R-6)
- Existing residential development west of SR 17, northwest of Randolph Road (Receiver R-7).

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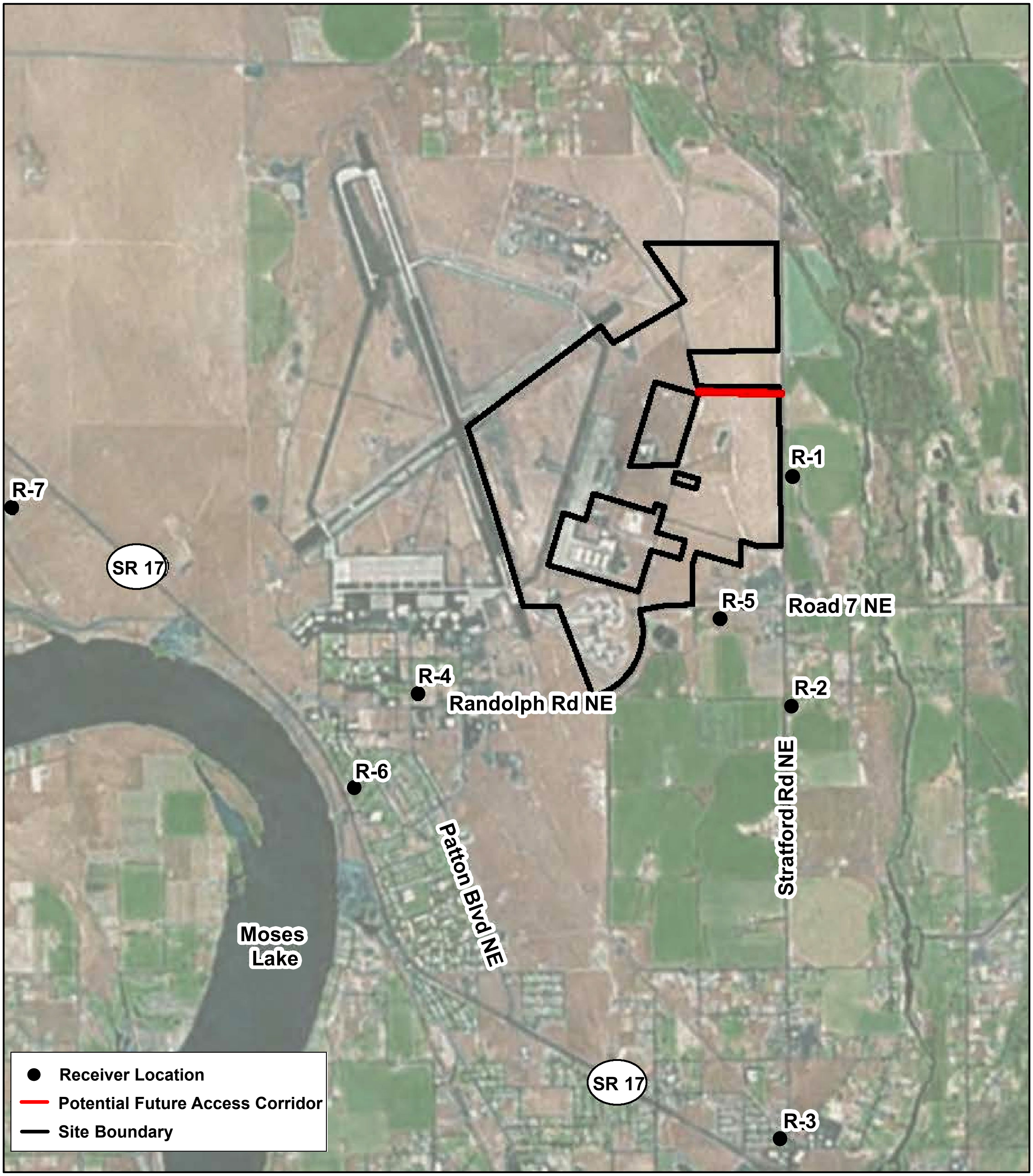


Source: Landau Associates, 2015.

Not to Scale

EA Engineering, Science, and Technology, Inc., PBC

Figure 3.6-1
Noise Receptor Locations

3.6.2 Impacts of the Alternatives

Development of the site under the EIS alternatives would result in the generation of noise during both construction and operational phases. Noise from the construction phase would be intermittent and would vary considerably depending on the specific nature of the construction, with some activities having a short duration and others a longer duration. This intermittent noise generation would occur over the assumed build-out period. Both construction and operational noise are considered in this section.

Alternatives 1 and 2

Future Noise Level Estimates

Industrial Noise

Noise levels at industrial workplaces can be very high, sometimes approaching 95 dB(A). For this analysis, it is assumed that very loud manufacturing activities would primarily take place indoors and that allowed uses in the proposed employment center would comply with the industrial noise requirements in MLC 18.40. It was therefore assumed that daytime noise levels associated with industrial activities would not exceed 60 dB(A) at surrounding residential properties. This regulation would also apply to allowed or conditionally allowed industrial uses, such as the testing of equipment or engines.

Aviation Noise

Noise levels generated by aviation activities were estimated using noise contours from the GCIA Master Plan Update. As described under Federal Aviation Regulation Part 150, a maximum DNL of 65 dB(A) is considered incompatible with residential land use. It was therefore assumed that noise levels associated with aviation noise would not exceed 65 dB(A) at surrounding noise-sensitive receivers.

Traffic Noise Modeling Methods

Traffic noise often exceeds the WSDOT (and FHWA) noise criteria for homes within 200 feet of a freeway or within 50 to 100 feet of an arterial roadway. The magnitude of the traffic noise impact near any given roadway would depend on the traffic volume, traffic speed, number of lanes and the setback distance to the homes.

For this EIS analysis, traffic noise related to increased traffic on Stratford Road NE, Randolph Road NE, Road 7 NE and SR 17 were evaluated for existing homes and noise-sensitive receptors. Peak-hour traffic volumes along these streets in the site vicinity under the existing conditions and projected for each alternative are provided in Section 3.10, **Transportation**. The FHWA Traffic Noise Model Version 2.5 was used to predict existing and future noise levels during the peak hour (see **Appendix G** for additional detail on noise modeling methodology).

Noise Analysis Results and Impacts

The modeled noise levels for noise sources under the existing conditions and all three EIS alternatives are shown in **Table 3.6-2.** The table lists the modeled daytime Leq noise levels at each representative receiver location for the existing conditions, and predicts individual noise sources at the receiver locations. Aircraft noise is the dominant existing noise source on the airport property, but the 65 dB contour does not extend beyond the limits of the airport property. Beyond the airport property, traffic noise is the dominant existing noise source.

Alternative 1

The potential for increases in noise under Alternative 1 are primarily associated with construction, aircraft operations, industrial activities, and traffic levels, as discussed below.

Construction Noise

Under Alternative 1, construction activities would occur over the approximately 20 year assumed project build-out period. Such noise would be temporary, and noise from construction at the site could cause minor temporary annoyance at scattered residences in the site vicinity. Identified roadway construction along Stratford Road NE, Randolph Road NE, Road 7 NE and SR 17 for the later phases of assumed development could cause annoyance at outdoor locations, residences and other noise-sensitive receivers located adjacent to these roadways. Daytime temporary construction activity (between the hours of 7 AM and 10 PM) is not regulated under the Moses Lake Municipal Code. Construction noise on and off the site (roadway improvements) would be typical of construction projects and, with implementation of the identified mitigation measures, is not anticipated to result in significant impacts.

Aircraft Noise

Under all of the EIS alternatives, assumed development would not result in changes to aircraft traffic at GCIA. As such, it is anticipated that there would be no impacts associated with aircraft-related noise. Surrounding noise-sensitive receptors would remain outside the airport's 65-dB(A) noise contour, which is the threshold for compatibility with residential land use, as described under Federal Aviation Regulation Part 150.

Table 3.6-2
ESTIMATED NOISE LEVELS

Noise-Sensitive Receiver	Noise Levels			
	Existing (2015)	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis (2035)	Alternative 2 Light Manufacturing/ Technology Emphasis (2035)	Alternative 3 No Action (2035)
Existing rural residences along Stratford Road NE, north of Tyndall Road NE (Receiver R-1)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Stratford Road NE (c)	56	63	64	58
Roadway Increase over existing condition	0	7 dB(A) increase	8 dB(A) increase	2 dB(A) increase
Existing rural residences along Stratford Road NE, south of Road 7 NE (Receiver R-2)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Stratford Road NE (c)	62	70	71	64
Roadway Increase over Existing Condition	0	8 dB(A) increase	9 dB(A) increase	2 dB(A) increase
Existing residential development in the Longview neighborhood, along Stratford Road NE, north of SR 17 (Receiver R-3)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Stratford Road NE (c)	62	70	71	63
Roadway Increase over Existing Condition	0	8 dB(A) increase	9 dB(A) increase	1 dB(A) increase
The Endeavor Middle School, located on Randolph Road NE (Receiver R-4)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Randolph Road NE (c)	58	68	69	60
Roadway Increase over Existing Condition	0	10 dB(A) increase	11 dB(A) increase	2 dB(A) increase
Existing rural residences along Road 7 NE (Receiver R-5)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Road 7 NE (c)	56	61	62	58
Roadway Increase over Existing Condition	0	5 dB(A) increase	6 dB(A) increase	2 dB(A) increase
Existing residential development east of SR 17, between Randolph Road NE and Stratford Road NE (Receiver R-6)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
SR 17 (c)	67	69	70	68

Table 3.6-2 Continued

Noise-Sensitive Receiver	Noise Levels: Existing (2015)	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis (2035)	Alternative 2 Light Manufacturing/ Technology Emphasis (2035)	Alternative 3 No Action (2035)
Roadway Increase over Existing Condition	0	2 dB(A) increase	3 dB(A) increase	1 dB(A) increase
Existing residential development west of SR 17, northwest of Randolph Road NE (Receiver R-7)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
SR 17 (c)	54	59	60	56
Roadway Increase over Existing Condition	0	5 dB(A) increase	6 dB(A) increase	2 dB(A) increase

Source: Landau Associates, 2015.

(a) Noise levels associated with industrial activities are maximum permissible noise levels per MLMC 18.40. Maximum permissible noise levels at residential properties are 60 dB(A) during daytime hours and 50 dB(A) during nighttime hours.

(b) Noise levels associated with airline traffic are provided as day-night average sound levels (DNLs)

(c) Noise levels associated with traffic are provided as 1-hour equivalent sound levels (1-hr Leq)

Industrial Noise

Under Alternative 1, it is assumed that the site would be developed into industrial property with an emphasis on heavy manufacturing and warehouse activities. This alternative would result in fewer employees and a smaller building area than Alternative 2, but could require larger industrial equipment associated with heavy manufacturing, which could result in higher levels of industrial noise. The site is located on industrial property and noise-sensitive receivers are limited to scattered rural residences in the vicinity. It is assumed that future development would comply with applicable noise regulations which establish permissible noise levels from industrial noise sources at receiving residential properties. As such, the assumed industrial activities under Alternative 1 are not anticipated to result in significant noise impacts at identified noise-sensitive receivers.

Traffic Noise

Under Alternative 1, it is projected that the employment center could support up to 13,519 employees. Full build-out of Alternative 1 would likely require substantial roadway improvements along Stratford Road NE and SR 17, as well as additional improvements at key intersections (see Section 3.10, **Transportation**, for details on roadway improvements).

As indicated in **Table 3.6-2**, the modeled peak-hour traffic noise increase at full build-out under Alternative 1 would exceed the WSDOT substantial increase impact threshold of 10 dB(A) at the Endeavor Middle School, located on Randolph Road NE (Receiver location R-4). Based on the screening-level noise analysis, it was determined that employment levels up to those projected at 94 percent of full build-out under Alternative 1 would result in peak-hour traffic noise levels below the 10 dB(A) impact threshold at the Endeavor Middle School. Mitigation for noise impact to Endeavor Middle School would likely be required for full build out under Alternative 1 (See **Section 3.6.3** for a discussion of identified mitigation measures).

Alternative 2

As described for Alternative 1, the potential for increases in noise under Alternative 2 are primarily associated with construction, aircraft operations, industrial activities and traffic levels, as discussed below.

Construction Noise

Under Alternative 2, the assumed new building area would be slightly larger than under Alternative 1. It is anticipated that noise related to construction activities would be similar under Alternative 2 to that described earlier for Alternative 1. As under Alternative 1, Alternative 2 is anticipated to require changes to arterial roadway configurations, which would result in temporary construction noise in residential areas. With identified mitigation measures, construction activities on the site and off the site (roadway improvements) would not be anticipated to result in significant impacts.

Aircraft Noise

Aircraft noise conditions under Alternative 2 would be as described for Alternative 1 and significant noise impacts associated with aircraft operations would not be anticipated.

Industrial Noise

Under Alternative 2, it is assumed that the site would be developed with industrial uses with an emphasis on light manufacturing and technology-related activities. This alternative would result in more employees, a larger building area, and larger parking areas than Alternative 1, but may not require extremely large industrial equipment associated with heavy manufacturing uses. Therefore, Alternative 2 would likely produce less industrial noise than Alternative 1. The site is located on industrial property and noise-sensitive receivers are limited to scattered rural residences in the vicinity. It is assumed that future development under Alternative 2 would comply with applicable noise regulations which establish permissible noise levels from industrial noise sources at receiving residential properties. As such, assumed development under Alternative 2 is not anticipated to result in significant industrial noise impacts at noise-sensitive receivers.

Traffic

Under Alternative 2, it is assumed that the site could support up to 19,010 employees. Full build-out of Alternative 2 would likely require substantial roadway and intersection improvements, similar to those assumed under Alternative 1.

Table 3.6-2 shows the forecast traffic noise levels for each representative receiver location. Under Alternative 2, the modeled peak-hour traffic noise increase at full build-out would exceed the WSDOT substantial increase impact threshold of 10 dB(A) at the Endeavor Middle School, located on Randolph Road NE. Based on the screening-level noise analysis, it was determined that employment levels up to those projected at 85 percent of full build-out under Alternative 2 would result in peak-hour traffic noise levels below the 10 dB(A) impact threshold at the Endeavor Middle School. As under Alternative 1, mitigation for noise impacts to Endeavor Middle School would likely be required for full-build-out under Alternative 2 (See **Section 3.6.3** for a discussion of identified mitigation measures).

Alternative 3

Under Alternative 3, the No Action Alternative, it is assumed that no new development or infrastructure improvements would be developed on the *GCIA Employment Center* site. The site would remain in its partially developed condition, and there would be no new sources of noise.

3.6.3 Mitigation Measures

The following identified mitigation measures address the potential noise impacts that could result from the assumed construction and long-term use under Alternative 1 or 2.

Required/Proposed Mitigation Measures

Prior to and During Construction

- Nighttime construction would not be allowed without approval from the local agencies (City of Moses Lake or Grant County). Local regulations do not regulate noise from daytime construction activities. Regardless, based on site-specific considerations at the time of construction permit review, construction contractors could be required to implement noise control plans for construction activities in the site area for daytime activities.
- Construction noise could be reduced by using enclosures or walls to surround noisy stationary equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing time of operation and locating equipment as far as practical from sensitive receivers. To reduce construction noise at nearby receivers, the following mitigation measures could be incorporated into construction plans and contractor specifications.
    - Locate stationary equipment away from receiving properties;
    - Erect portable noise barriers around loud stationary equipment located near sensitive receivers;
    - Limit construction activities to between 7:00 AM and 8:00 PM on weekdays and between 9:00 AM and 6:00 PM on weekends and holidays to avoid sensitive receptors during nighttime hours;
    - Turn off idling construction equipment; and
    - Require contractors to rigorously maintain all equipment.

During Operation

Industrial Noise Sources

- Future industrial operation would be required to comply with the applicable noise regulations which establish permissible noise levels from industrial noise sources at receiving off-site properties.

Traffic Noise Sources

- Development exceeding approximately 94 percent of assumed full development under Alternative 1 and exceeding 85 percent of assumed full development under Alternative 2, would require mitigation to limit increased traffic noise on Randolph Road from significantly impacting Endeavor Middle School. Mitigation measures could include:
  - Limiting traffic on Randolph Road to a level not exceeding 94 percent of total assumed trips under Alternative 1, and 85 percent of total assumed trips under Alternative 2; or,
  - Construction of a noise barrier between the school and Randolph Road as the level of traffic on Randolph Road approaches 94 percent of total assumed trips under Alternative 1, and 85 percent of total assumed trips under Alternative 2.

3.6.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse noise-related impacts are anticipated with implementation of the mitigation measures listed above.

3.7 LAND USE

This section of the DEIS describes land use conditions on and in the vicinity of the *GCIA Employment Center* site. Potential impacts – both direct and indirect – from development of the EIS alternatives are evaluated and mitigation measures identified. **Section 3.7.5 Relationship to Plans and Policies** compares the consistency of the alternatives with relevant federal, state and local land use plans, policies and regulations.

3.7.1 Affected Environment

Land Use History

In November 1942, the federal government opened the Moses Lake Army Air Base on approximately 10,000-acres of land (including the *GCIA Employment Center site*) in order to train P-38 pilots and later, B-17 Flying Fortress crews. The base was briefly mothballed in May 1945 to 1948 when the facility was reopened as a U.S. Air Force Base (AFB); the facility was renamed Larson AFB in 1950. In 1960, the based became a Strategic Air Command (SAC) base and also acquired three Titan missile-launching facilities. At its height, Larson AFB had more than 4,000 employees and housed 8,000 people.

The Larson AFB was closed in June 1966. The community decided to create a public port to administer the airport and other associated lands. As a result, the Grant County Port District No. 10, the Port of Moses Lake was established and dedicated in October 1966. Several long-term business relationships were established at the airport, including Japan Airlines which trained most of their pilots there from the mid-1960s to 2009, and the Boeing Company which has had operations at the Airport since 1950. Commercial airline service was provided at the airport from 1977 until 2010. At its peak, the airport had approximately 11,500 annual passenger boardings.

More recently, the Port has been active in marketing the industrial land of the GCIA, and several industrial businesses have located to the site, primarily along the eastern portion of the airport. These businesses include SGL Automotive Carbon Fiber, Moses Lake Industries, Olympic Steel, Genie Lifts, and AstaReal Technologies.

In addition, an area of the western portion of the site is owned by the City of Moses Lake and had been historically used as a gun range dating back to approximately 1955.

See Section 3.9, **Historic and Cultural Resources**, and **Appendix H** for additional information on the site's history.

Existing Land Use

Site

The *GCIA Employment Center* site is located on and adjacent to the Port of Moses Lake. The site is situated in Grant County and City of Moses Lake, and the east edge of the Port property (see **Figure 2-1** for a vicinity map and **Figure 2-2** for a site map). The approximately 1,258-acre site is comprised of 34 parcels (see **Figure 2-3** for a site parcel map). Currently, the site is primarily vacant and undeveloped. Nine existing buildings are located on the site and occupy approximately 342,000 sq. ft. of building area. These buildings are owned by the Boeing Company, the Port of Moses Lake, USDA Forest Service, Aero-Space Port International (ASPI) Group, the City of Moses Lake, the North American Free Trade Zone Industrial LLC and the ASA Development Group; many of these buildings are used for industrial uses similar to surrounding areas (see **Table 2-1** for summary of the existing on-site buildings).

Approximately 141 acres of the *GCIA Employment Center* site (11 percent) are currently in impervious surfaces, including buildings, loading areas, parking lots, roadways, sidewalks and airport taxiway areas. The remaining 1,117 acres (89 percent) of the site are comprised of natural open space areas.

Existing vehicular access to the site is provided by two north-south roadways (Stratford Road NE/Road J NE and Randolph Road NE) and three east-west roadways (Tyndall Road NE, Road 7 NE and Turner Road NE). Stratford Road NE/Road J NE connects with State Route (SR) 17 and the downtown Moses Lake area to the south.

Site Vicinity

Existing Surrounding Land Uses

The existing land use pattern in the vicinity of the *GCIA Employment Center* site is varied and generally consists of airport uses, industrial/warehouse uses, residential uses, agricultural uses, institutional uses and natural open space and vacant land. In general, airport uses associated with the GCIA are located immediately west of the site. Industrial/warehouse uses are generally located to the north, south and east, as well as on out parcels (parcels that are not part of the project site) located within the central portion of the site. Residential and agricultural uses are generally located further to the north, east and south of the site, while airport and institutional uses are located further to the southwest.

Specific existing land uses located on the out parcels located within the central portion of the site include Genie Industries manufacturing operations, Moses Lake Industries and the SGL/BMW Automotive Carbon Fiber Plant. The Genie Industries operations are located in the south-central out parcels area and consist of one- to two-story manufacturing buildings for the production of boom lifts and industrial platforms. Moses Lake Industries uses are located in the central out parcel area and include one and two-story buildings that are used for the development of high-performance industrial chemicals. The SGL/BMW Carbon Fiber Plant is located in the north-central out parcel area and consists of two-story buildings that are used for the production/manufacturing of automotive carbon fiber (see **Figure 3.7-1** for the locations of land uses in the vicinity of the site).

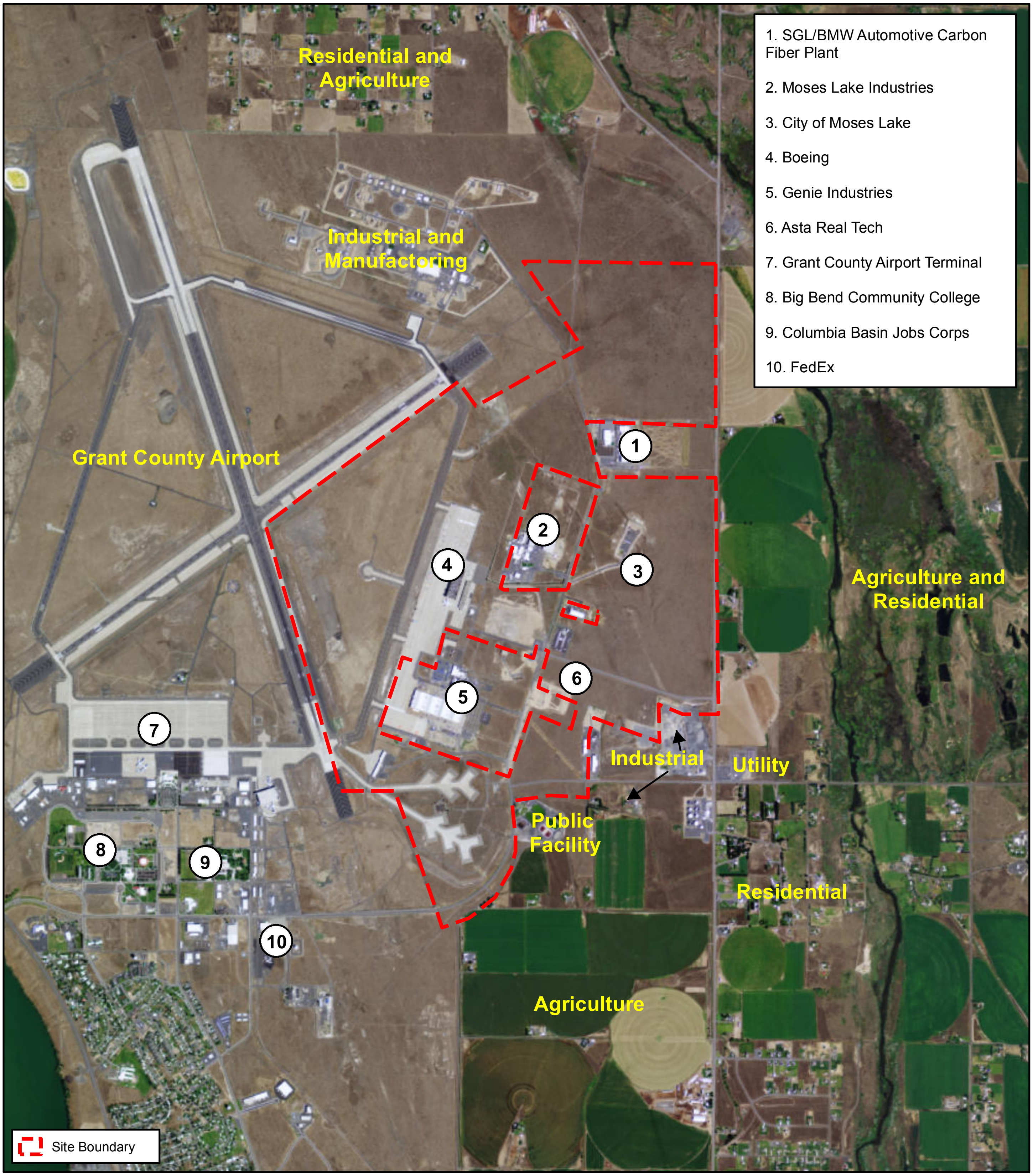
The area to the north of the site is generally comprised of natural open space areas. Industrial uses are also located to the north, including Takata Industries and General Dynamics. Takata Industries manufactures propellant and airbag system components for the automotive industry. General Dynamics is an aerospace and aviation company that specializes in the design and production of aerospace, aviation, marine systems and defense products. Further to the north are agricultural uses, rural residential uses and natural open space areas that are located off of Road 10 NE and adjacent roadways (see **Figure 3.7-1**).

To the east of the site are natural open space areas and agricultural uses, with industrial uses located to the southeast of the site. Immediately east of the site (between Tyndall Road NE and Road 7 NE) are the Consolidated Disposal Services Recycling and Transfer Center and AAA Readymix Concrete operations. To the south of Road 7 NE are the Larson Sewage Treatment Plant and the Moses Lake Terminals tank farm. Further to the east, beyond Stratford Road NE, are the Grant County Public Utility District (PUD) Larson Substation, agricultural uses, rural residential uses and naturally vegetated areas (see **Figure 3.7-1**).

To the south of the site are the above-mentioned Larson Sewage Treatment Plant and the Moses Lake Terminals tank farm. Agricultural uses, natural open space areas and rural residential uses are also located to the south. Single family residential development is located further to the southeast, including the Stratford Road Estates subdivision that is currently under construction (see **Figure 3.7-1**).

To the immediate west of the site are land uses related to the GCIA, including runways, taxiways, roadways, the GCIA Terminal and other airport uses. Further to the west and southwest are buildings associated with Federal Express shipping operations; the Columbia Basin Job Corps Center; and buildings, parking areas, recreation areas and open space areas associated with Big Bend Community College (see **Figure 3.7-1**).

Grant County International Airport Employment Center
Draft EIS



Source: EA, ESRI, 2015.

EA Engineering, Science, and Technology, Inc., PBC

0 0.25 0.5 1 1.5 Miles

Figure 3.7-1
Existing Land Uses

Existing Land Use Designations

Comprehensive Plan

Grant County

The *Grant County Comprehensive Plan* provides policy guidance for land use and related matters for all land within the unincorporated areas of Grant County. The Comprehensive Plan establishes land use designations and land use goals/policies to guide land uses within Grant County. According to the *Grant County Comprehensive Plan*, the majority of the western portion of the *GCIA Employment Center* site is designated as Port of Moses Lake; land use within these areas is governed by the Port of Moses Lake's Airport Master Plan (see the discussion below for details). In addition, central and eastern portions of the site are within the County jurisdiction and are designated as Industrial (Urban). The Industrial (Urban) designation allows for heavy industrial uses (heavy manufacturing, processing and industrial development not appropriate near residential areas) and light industrial uses (office parks, medical services and light industrial activities such as wholesaling and light manufacturing). See the discussion on *Zoning* below for more information on the types of uses permitted in the Industrial (Urban) designation.

Existing *Grant County Comprehensive Plan* land use designations in the vicinity of the site include: Rural Residential 1, Rural Residential 2 and Rural Remote to the north; Rural Residential 1 and Rural Remote to the east; Rural Residential 1 to the south; and Port of Moses Lake to the west.

City of Moses Lake

Areas within the eastern portion of the *GCIA Employment Center* site are within the jurisdiction of the City of Moses Lake and are designated by the *Moses Lake Comprehensive Plan* as Industrial and Public Facilities. The Industrial designation is intended to encourage the development of diversified industrial and manufacturing activities to provide employment in the area. The Public Facilities designation is intended to provide areas for public facilities, uses and operations. Other adjacent areas within the City of Moses Lake located to the south of the site are also designated as Industrial. The City of Moses Lake typically updates their Comprehensive Plan on an annual basis and public hearings for the update process generally occur in the fall.

Zoning Code

Grant County

According to the Grant County Unified Development Code, the majority of the western portion of the *GCIA Employment Center site* is zoned as Grant County International Airport and land uses within these areas are regulated by the Port of Moses Lake's Airport Master Plan (see the discussion below for details). Areas in the central and eastern portions of the site are within unincorporated Grant County and are zoned as Urban Heavy Industrial (UHI). The primary purpose of the UHI zone is to allow for industrial developments in urban growth areas that have the potential for more than a minimal level of disturbance to adjacent properties, including heavy manufacturing, processing and industrial development generally not appropriate near residential areas. This zoning district is established to preserve areas for industrial and related uses that could create serious problems of compatibility with other kinds of land uses, and to make provisions for those commercial uses which are most appropriately located as neighbors of industrial uses or are necessary to serve the immediate needs of people in these areas. Permitted uses in the UHI zone include, but are not limited to: heavy industrial, light industrial, light manufacturing and warehouse facilities (see **Figure 3.7-2** for a map of the existing zoning).

Grant County zoning classifications in the vicinity of the site within unincorporated Grant County include: Rural Residential 1, Rural Remote and Agriculture to the north and east; Rural Residential 1 and Rural Residential 2 to the south; and Grant County International Airport, Rural Residential 1 and Rural Remote to the west.

City of Moses Lake

The areas within the eastern portion of the *GCIA Employment Center* site that are within the jurisdiction of the City of Moses Lake are zoned as Heavy Industrial (HI) and Public (P). The HI zone is intended to accommodate heavy industrial uses and to preserve land for such uses at locations that will permit less restrictive industrial performance standards and bulk regulations than are required in the Light Industrial zone, thereby providing greater flexibility to accommodate a variety of heavy industrial uses such as manufacturing, fabricating, processing, warehousing, distribution and assembly. Permitted uses include manufacturing, processing and packaging; hazardous materials treatment and storage; warehousing and distribution; and technological uses.

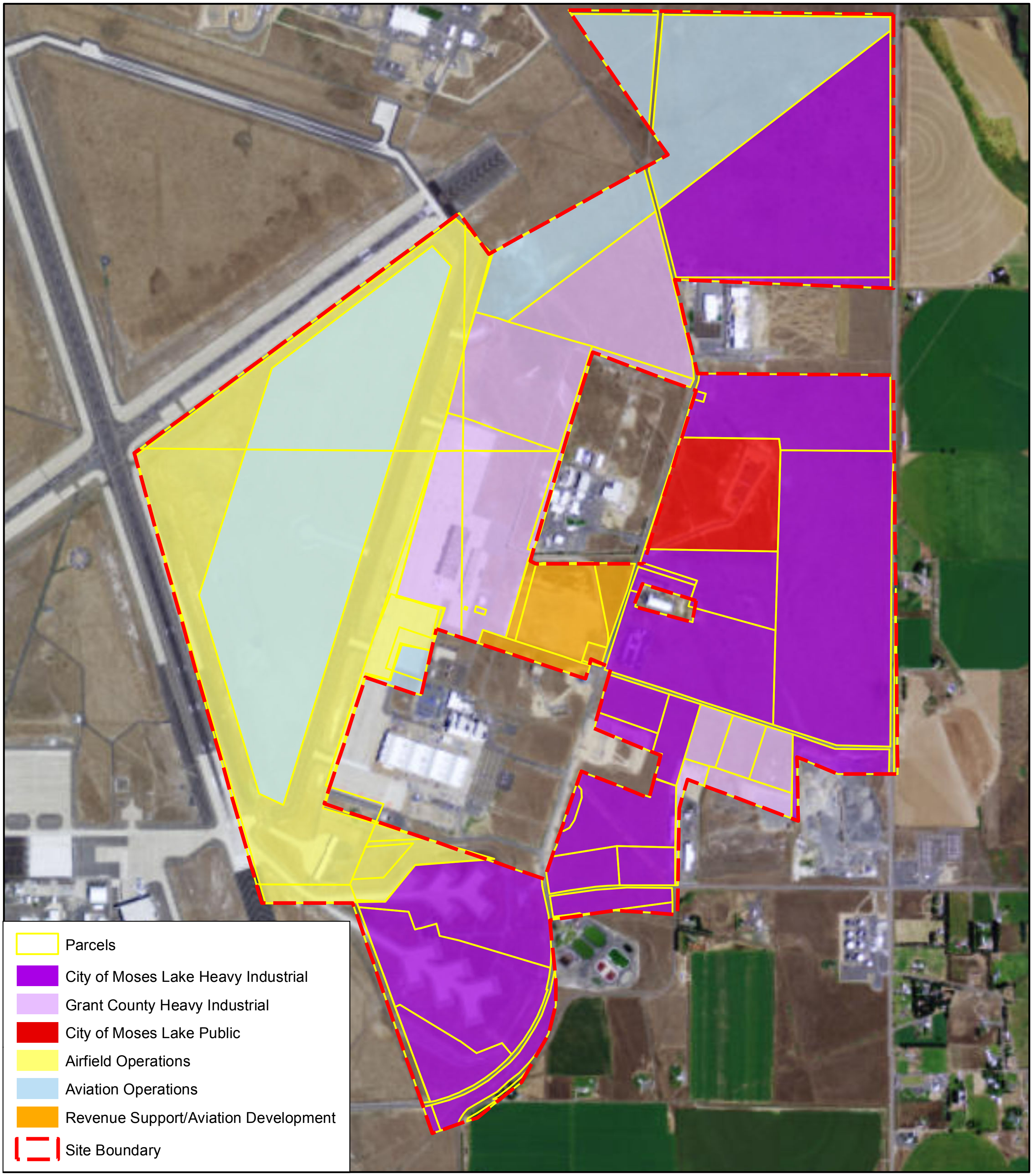
The P zone is intended to provide areas for a variety of public uses that are required in the city such as parks, offices, community facilities and schools. Permitted uses include city, state or federal offices, public libraries, public parks, public schools, public auditoriums and utility-related uses operated by a government agency (see **Figure 3.7-2**).

Other adjacent areas within the City of Moses Lake are located to the south of the site and are also zoned as HI.

Grant County International Airport Master Plan

In 2005, the Port of Moses Lake updated the *Grant County International Airport Master Plan* (*2005 Airport Master Plan*) in order to identify the potential airport facility needs over the next 20 years and to outline the direction for the future development of the airport. The *2005 Airport Master Plan* was intended to provide recommendations for the orderly development of essential airport facilities, as well as guidance in creating opportunities for economic development at the airport. The *2005 Airport Master Plan* concluded that the present runway system was adequate to meet the needs of the full-range of aviation aircraft that uses the airport. However, maintenance and improvements would be needed to increase safety and efficiency of operations.

Grant County International Airport Employment Center
Draft EIS



Source: EA, Reid Middleton, ESRI, 2015.

EA Engineering, Science, and Technology, Inc., PBC

Figure 3.7-2
Existing Zoning and Airport Master Plan

In addition, new areas were identified for landside development, as well as infill development opportunities in existing areas. The On-Airport Land Use Plan within the *2005 Airport Mater Plan* identified proposed land uses for existing vacant areas within the Port of Moses Lake Grant County International Airport property, including aviation dependent and aviation-related uses in the east airport area (immediately east of the runway areas, and including the *GCIA Employment Center* site), potential acquisition areas for aviation dependent uses further to the east and non-aeronautical commercial/industrial uses to the northeast and southeast.

In June 2014, the Port of Moses Lake completed a draft of their most recent update to the *Grant County International Airport Master Plan (2014 Airport Master Plan)*[1]. The intent of the *2014 Airport Master Plan* is to provide guidance for further development and identify development priorities. The plan determined projected needs of airport users; recommended improvements; developed new airport layout drawings; established a schedule of development priorities; and provided specific recommendations for aviation and non-aviation land uses at the site. With regard to land use, the *2014 Airport Master Plan* identifies future land uses for on-airport property in two categories: aeronautical and non-aeronautical. Aeronautical uses are all land uses that involve or are directly related to the operation of aircraft, while non-aeronautical uses are those that do not need runway or taxiway access. Land use designations in the *2014 Airport Master Plan* are broken down into the following three categories:

- **Airfield Operations** – Areas that encompass the major airside elements such as runways, taxiways, runway safety areas, runway object free areas, runway obstacle free zones, runway protection zones, taxiway safety areas, taxiway object free areas, navigational aids and their critical areas and the runway visibility zone. These areas are intended to provide for safe and efficient aircraft taxiing, take-off and landing.

- **Aviation Development** – Areas reserved for development that needs access to the Airfield Operations area; current and future aircraft access must be preserved in these areas. Typical land uses include: transportation terminals (i.e., commercial airlines, commuter airlines, fixed base operators, aircraft maintenance, retail fueling, etc.), warehouses (aircraft hangers) and vocational schools (flight training).

- **Revenue Support** – Development that is compatible with airport activities but is unlikely to require access to the runway and taxiway system; these land uses can include both aviation and non-aviation development. Typical land uses include: airport-related facilities, research facilities, testing laboratories; manufacturing, processing and assembly facilities; warehouses; vocational schools; and eating and drinking establishments.

[1] The 2014 Airport Master Plan is currently under review and awaiting formal approval by the FAA.

The *GCIA Employment Center* site includes Airfield Operations areas in the western portion of the site (adjacent to the existing runway areas). Aviation Development areas are also located in the western portion of the site, as well as near the north and south boundaries of the site, adjacent to the Airfield Operations areas to provide access for aircraft uses. An area for Revenue Support uses is located in the central portion of the site (see **Figure 3.7-2**).

Area Building Characteristics (Height and Bulk)

The *GCIA Employment Center* site is primarily an undeveloped area with some industrial/warehouse development located primarily in the western and central portions of the site. Existing buildings on the site are primarily, one- and two story industrial and warehousing structures that range in size from approximately 3,500 square feet to 170,000 square feet (see Table 2-1 in **Chapter 2** for details).

The site vicinity is also characterized by large areas of undeveloped land. The bulk and scale of building development adjacent to the site is generally characterized by low-rise (one- to two-story) industrial, manufacturing and warehousing structures. Several of these developments (e.g., SGL/BMW Automotive Carbon Fiber Plant, Moses Lake Industries and Genie Industries) are located in large-scale buildings. Areas to the north and east of the site include rural residential development with one- and two-story structures.

Areas to the west of the site include airport development, such as runways, the Grant County Airport Terminal building and other airport development. The majority of the buildings are one- to two stories in height. The terminal building is a large-scale structure.

Development to the southwest includes buildings associated with Federal Express shipping operations, the Columbia Basin Job Corps Center, and Big Bend Community College. The majority of these buildings are also one- to two-stories in height.

3.7.2 Impacts of the Alternatives

This section analyzes land use impacts on and in the vicinity of the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are so noted.

Future land use on the site would be governed by existing zoning requirements (Grant County and the City of Moses Lake) and other applicable regulations (e.g., the Grant County International Airport Master Plan). As explained in **Chapter 2** of this DEIS, a conceptual land use map has been prepared which presents a concept illustrating how the site could potentially be developed in the future, assuming no changes to the site’s land use classifications and proposed land uses that represent uses that realistically could be expected to develop on the site given the site’s unique setting adjacent to the Grant County International Airport. At this point in the process there are no specific development plans or defined building locations/designs proposed for the site. It is assumed that Alternatives 1 and 2 would include similar infrastructure systems, including roadway networks and utilities. However, the mix and location of land uses would differ under the alternatives.

Alternatives 1 and 2

Construction

Site preparation and construction of infrastructure and buildings on the site under Alternatives 1 and 2 would result in temporary impacts to adjacent land uses over an approximately 20-year build-out period. Site preparation, including clearing and grading, could occur during the first year of the construction period or could be phased over time; building construction and occupancy would occur over the full build-out period. Temporary construction-related impacts would include: dust from grading; emissions from construction vehicles and equipment; increased noise levels from construction activities; and increased traffic associated with construction vehicles and construction workers. Construction activities would be anticipated to occur incrementally over the approximately 20-year buildout period; this construction activity would move around the site and could result in temporary impacts to adjacent uses when construction is directly proximate to those areas. Construction-related land use impacts could be somewhat greater under Alternative 2, as there would be a total of approximately 10.1 million sq. ft. of development under Alternative 2 versus approximately 8.8 million sq. ft. of development under Alternative 1.

Operation

Direct Impacts

The types of direct land use impacts that could potentially occur from development under Alternatives 1 and 2 relate to the conversion of land uses, the compatibility of the proposed land uses with surrounding land uses (including changes in land use intensity or activity level) and the relationship of proposed building height and bulk with surrounding uses. These types of impacts are discussed below.

Conversion of Uses

Proposed development under Alternatives 1 and 2 is intended to be consistent with the existing Grant County and City of Moses Lake Comprehensive Plan designations and zoning classifications for the site; these designations/classifications are intended to ensure compatibility with surrounding uses. The proposed *GCIA Employment Center* would contribute to the ongoing transition of the area to higher intensity uses, with an emphasis on heavy manufacturing and warehouse uses under Alternative 1 and light manufacturing and technology uses under Alternative 2.

Development under Alternatives 1 and 2 would result in the permanent conversion of primarily undeveloped, natural open space areas to new employment center uses that would be consistent with the site’ s existing zoning.

Assumed new uses on the site under Alternatives 1 would include the following:

- **Airport Operations** – Continuation of existing airport operation facilities on the site.
- **Aviation Development** – Fixed base operators; specialized aviation services; aircraft maintenance; retail refueling services; and warehouses (aircraft hangers).
- **Revenue Support** – Facilities for manufacturing; processing and/or assembly of products; and warehouses.
- **Heavy Industrial** – Machine shop; welding or metal fabrication; heavy industrial, manufacturing, processing or packaging; heavy construction equipment storage, sale and rental; warehousing and distribution facilities; bulk fuel storage; and transportation services (e.g. freight consolidation).
- **Public Facilities** – Continuation of existing public facility uses on the site.

Assumed new uses on the site under Alternative 2 would include the following:

- **Airport Operations** – Continuation of existing airport operation facilities on the site.
- **Aviation Development** – Fixed base operators; specialized aviation services; aircraft equipment sales/rentals; and vocational schools (flight training).
- **Revenue Support** – Airport-related facilities; research facilities and testing laboratories; and vocational schools.
- **Heavy Industrial** – Light industrial; light manufacturing; and technological uses (laboratories).
- **Public Facilities** – Continuation of existing public facility uses on the site.

Under Alternative 1, it is assumed that approximately 1,084 acres (approximately 86 percent) of the site would be in built area, including new buildings, roadways and other impervious surfaces. The remaining approximately 147 acres (approximately 14 percent) of the site would be in open space area, newly landscaped area and other vegetated areas. Approximately 8.8 million sq. ft. of new building area would be developed on the site under Alternative 1, including approximately 2.2 million sq. ft. of Aviation Development uses, 274,500 sq. ft. of Revenue Support uses and 6.3 million sq. ft. of Heavy Industrial uses.

Under Alternative 2, it is assumed that approximately 1,007 acres (approximately 80 percent) of the site would be in built area, including new buildings, roadways and other impervious surfaces. The remaining approximately 251 acres (approximately 20 percent) of the site would be in open space area, newly landscaped area and other vegetated areas. Approximately 10.1 million sq. ft. of new building area would be developed on the site under Alternative 2, including approximately 2.2 million sq. ft. of Aviation Development uses, 548,900 sq. ft. of Revenue Support uses and 7.3 million sq. ft. of Heavy Industrial uses.

Relationship to Surrounding Uses

The relationship of the proposed new land uses with surrounding land uses is primarily a function of the intensity of the new uses (such as the type of site uses, density of the development and levels of activity associated with new development), intensity of the surrounding uses, proximity of the new uses to surrounding uses and provisions for buffers between new and surrounding uses.

As described under **Section 3.7.1, Affected Environment**, at present the site area is primarily vacant and undeveloped. It includes nine existing buildings that are primarily used for industrial, manufacturing and warehouse uses. Existing land uses adjacent to the site are varied and generally consist of airport, industrial, residential, agricultural, institutional uses and natural open space and vacant land. In general, airport uses associated with the Grant County International Airport are located immediately to the west of the site. Manufacturing and industrial uses are generally located adjacent to the north, south and east, as well as within the out parcel areas in the central portion of the site. Residential and agricultural uses are generally located further to the north, east and south of the site, while airport uses and institutional uses are located further to the southwest.

The amount of building area on the site would increase from approximately 342,000 sq. ft. under existing conditions to approximately 8.8 million sq. ft. of heavy manufacturing/warehouse uses under Alternative 1 and approximately 10.1 million sq. ft. of light manufacturing/technology uses under Alternative 2. Under Alternatives 1 and 2, aviation development and revenue support uses would be primarily located along the western portion of the site (adjacent to and including a portion of the Grant County International Airport). Under Alternative 1, heavy manufacturing and warehousing uses would primarily be located in the eastern and central portions of the site; under Alternative 2 these areas of the site would include light manufacturing and technology uses.

Activity levels (i.e., noise, traffic, etc. associated with increased site population) on the site and in the surrounding area would increase as a result of the proposed development. An estimated 13,519 employees would occupy the site at full build-out under Alternative 1 and an estimated 19,010 employees would occupy the site at full build-out under Alternative 2. The types of activity under Alternatives 1 and 2 would be typical of industrial uses (such as those in the site vicinity) and would include vehicular and pedestrian traffic and noise associated with traffic and manufacturing activities (including truck loading and industrial operations). The general character of new industrial activity would be similar to that of other existing industrial uses adjacent to the site, including Genie Industries, Moses Lake Industries, SGL/BMW Automotive Carbon Fiber Plant, Consolidated Disposal Services Recycling and Transfer Center and the AAA Readymix Concrete operations.

However, while the types of activity would be similar to surrounding uses, the overall activity levels would increase when compared to the relatively undeveloped condition of the existing site. Development under Alternatives 1 and 2 would represent a substantial increase in building density and associated activity levels on the site. Due to the level and intensity of new on-site development, the site would have a higher activity level than the surrounding industrial, residential, institutional and agricultural uses in the site vicinity.

Land use conditions associated with the *GCIA Employment Center* would differ somewhat between Alternatives 1 and 2 due to the different land use emphasis that are assumed under each of the alternatives (heavy manufacturing/warehousing emphasis under Alternative 1 versus light manufacturing/technology under Alternative 2). Because of the differences in uses assumed under Alternatives 1 and 2, there would be some differences in the relationship to surrounding land uses between the two alternatives. For example, Alternative 1's emphasis on heavy manufacturing and warehouse uses could result in higher levels of noise as a result of the associated industrial equipment, while Alternative 2's greater building area and number of employees associated with light industrial and technology uses could result in higher activity levels and traffic. It should be noted that the actual mix and location of uses could vary from that assumed under Alternatives 1 and 2; the specific mix and layout of uses onsite would be determined when specific development plans are submitted or as part of a possible Master Plan process.

Proposed access to the site under Alternatives 1 and 2 would continue to be provided from the south via Stratford Road NE and Randolph Road NE. East-west connections through the site would also continue to be provided by Tyndell Road NE, Road 7 NE and Turner Road NE. Development of a new east-west roadway could be provided in the northern portion of the *GCIA Employment Center* site to provide additional access to land-locked portions of the site. Several smaller access roads/driveways would branch off from the main north-south and east-west roadways to provide access to individual buildings; the locations of these roadways/driveways would be determined when specific development plans are submitted or as part of a possible Master Plan process. Due to the level of development on the site, both alternatives would be anticipated to result in increased traffic and associated noise from employees travelling to and from the site (see the Section 3.6, **Noise**, and Section 3.10, **Transportation**, and **Appendices C** and **G** for details).

The Grant County Unified Development Code and the City of Moses Lake Municipal Code include provisions to ensure the compatibility of development on industrially-zoned properties with adjacent surrounding land uses. These regulations include: landscaping buffers, visual screening, building setbacks, maximum building heights, lighting standards, as well as performance standards for operation (e.g., to address noise, air quality, odors, hazardous materials, etc.). The *GCIA Employment Center* would be required to conform to these regulations unless they are modified through a possible Development Agreement. As a result, significant land use impacts would not be anticipated (see **Section 3.7.5, Relationship to Plans and Policies**, for details).

Building Characteristics (Height and Bulk)

The maximum building heights and maximum amount of site coverage on the site with proposed development would be controlled by the provisions of the Grant County Unified Development Code, the City of Moses Lake Municipal Code and the Port of Moses Lake Airport Master Plan.

The Grant County Unified Development Code (Section 23.12, Table 1) identifies the density and dimension standards for urban zoning districts, including the UHI zone that is located on a portion of the site. The UHI zone allows a maximum building height of 35 feet and a maximum building coverage of 80 percent.

The City of Moses Lake Municipal Code (Section 18.40) identifies development standards for industrial zones. The City's HI zone does not contain any maximum building height or maximum building coverage requirements. However, building heights in the HI zone are also subject to Section 18.52 (Grant County Airport Zoning), which identifies development standards for various areas surrounding the Grant County International Airport. According to Section 18.52, maximum building heights in the HI-zoned areas of the site would be 35 feet.

The height and scale of buildings on the site under Alternatives 1 and 2 would be a function of the type of use each building is designed to house. For example, buildings designed to house heavy manufacturing and warehouse-type uses under Alternative 1 would typically be more efficiently housed in buildings that are one to two stories in height; buildings of this height allow for manufacturing, warehousing and loading functions to be located on the same level. Buildings designed for technology uses under Alternative 2 could be designed as two to three-story structures. Accordingly, it is assumed that buildings housing manufacturing and/or warehouse uses could generally be one to two stories in height and buildings housing technology uses could be taller. However, potential uses on the site could be built to the maximum building height allowed based on the applicable zoning regulations for each specific building site (Grant County Unified Development Code and City of Moses Lake Municipal Code).

Under Alternatives 1 and 2, the existing largely vacant site would be developed in new buildings generally ranging from one- to three-stories in height, consistent with existing zoning regulations. Development in the western portion of the site would be in aviation and aviation-related uses and development in the central and eastern portions would be either heavy manufacturing and warehousing uses (Alternative 1) or light manufacturing and technology uses (Alternative 2). The majority of the buildings on the site would likely feature relatively large footprints. The scale of individual buildings on the site under Alternatives 1 and 2 would likely be similar to existing adjacent industrial uses (Genie Industries, Moses Lake Industries and SGL/BMW Automotive Carbon Fiber Plant); however, the scale of new buildings would likely be greater than residential uses, agricultural uses and institutional uses located to the north, east and south of the site.

Indirect Impacts

Land uses assumed under Alternatives 1 and 2 would contribute to cumulative employment growth and intensification of land uses in Grant County and the City of Moses Lake and would further the trend of development of the area on and adjacent to the Grant County International Airport in aerospace and industrial land uses. Given the location of the site within an Urban Growth Area (UGA) and the existence of supporting services (e.g.,. retail and personal services) in the area (approximately three miles to the south in the City of Moses Lake), it is anticipated that existing supporting services could serve a portion of the demand that would be generated by development of the *GCIA Employment Center* site. However, given the level of development under Alternatives 1 and 2, it is anticipated that increased demand for supporting services could create indirect pressure for properties in the site vicinity to redevelop. In addition, given the level of new employment that would be generated by development on the site, an increased demand for new housing in the site vicinity could be indirectly generated by associated new employees on the site under Alternatives 1 and 2. To the extent that new development is consistent with the Grant County Comprehensive Plan and City of Moses Lake Comprehensive Plan, it is anticipated that new development on the *GCIA Employment Center* site would be consistent with the County and City's future planning for the area.

Alternative 3

Under Alternative 3, the No Action Alternative, development of the *GCIA Employment Center* would not occur at this time and no additional airport, manufacturing, warehousing or technology uses would be constructed on the site. The site would remain in its primarily vacant and undeveloped condition. Future development could occur on the site, consistent with the existing County, Port and City land use designations and zoning classifications for the site.

3.7.3 Mitigation Measures

The following required/proposed mitigation measures address the potential land use impacts that could result from the construction and long-term use of Alternative 1 or 2.

Required/Proposed Mitigation Measures

- Development of the *GCIA Employment Center* under Alternatives 1 and 2 would be consistent with the site's existing zoning classifications and new development would be required to comply with applicable zoning requirements for the site, including maximum building heights, maximum lot coverage, building setbacks, landscaping, visual screening and performance standards for operation (e.g., for noise, air quality, odors, hazardous materials, etc.).

- A Development Agreement could be executed between the County, Port, City and other property owners at the site. This agreement could specify the standards and conditions that would govern development of the site.
- A Master Plan could be developed for the site for review and approval by the County Port and City. This plan would contain more definitive information on site development, infrastructure, parking and landscaping, and could represent a more cohesive, predictable concept for development of the site.

3.7.4 Significant Unavoidable Adverse Impacts

Development under Alternatives 1 and 2 would convert the largely vacant, undeveloped *GCIA Employment Center* site to a new employment center with a mix of airport, manufacturing, warehouse and technology uses. Alternatives 1 and 2 would result in the intensification of site development and an increase in site activity levels. No significant unavoidable adverse land use impacts are anticipated with adherence to applicable zoning requirements for the site.

3.7.5 Relationship to Plans and Policies

This section evaluates the consistency of the EIS alternatives with relevant plans, policies and regulations. The key state and local plans that are summarized and evaluated include the:

- Washington State Growth Management Act (GMA);
- Grant County Comprehensive Plan, Land Use Code and Critical Areas Ordinance;
- City of Moses Lake Comprehensive Plan, Land Use Code and Critical Areas Ordinance; and
- Grant County International Airport Master Plan.

Washington State

Growth Management Act

Summary: GMA (RCW 36.70A) was adopted in 1990 and subsequently amended, provides a comprehensive framework for managing growth and coordinating land use planning with the provision of infrastructure. The general goals of the GMA include, in part: directing growth to urban areas; reducing sprawl; encouraging economic development consistent with adopted comprehensive plans; protecting private property rights; providing efficient multi-modal transportation systems; encouraging a variety of housing types and densities affordable to all economic segments of the population; protecting the environment; and ensuring that public facilities and services necessary to support development meet locally established minimum standards at the time development is in place (RCW 36.70A.020).

Jurisdictions subject to GMA must prepare and adopt: countywide planning policies; comprehensive plans containing policies with specific elements for land use, transportation, housing, capital facilities, utilities, rural lands and economic development; and development regulations implementing those plans.

The GMA requires that each county and city in Washington comprehensively review and revise its Comprehensive Plan and development regulations, as necessary every seven years to ensure that they comply with the GMA.

Discussion: Consistent with the GMA, Grant County and the City of Moses Lake have adopted Comprehensive Plans to guide future development and fulfill their responsibilities under the GMA. Grant County adopted their most recent Comprehensive Plan in 2006. The City of Moses Lake adopted their current plan in 2001, and significant updates were completed in 2014. The *GCIA Employment Center*, as described in **Chapter 2** of this DEIS, would encourage economic development and provide a variety of employment opportunities and densities, consistent with the GMA goals and policies outlined above. The relationship of the development alternatives to the Grant County and City of Moses Lake Comprehensive Plans are discussed below.

Grant County

Grant County Comprehensive Plan

Summary: The Grant County Comprehensive Plan (adopted in 1999 and last updated in 2006) was completed in compliance with the GMA and the Grant County Countywide Planning Policies. The Plan establishes goals and policies which guide future land use and coordinate growth within the County and its planning area over a 20-year planning horizon. In particular, the Comprehensive Plan serves as a guideline for designating land uses, infrastructure development and community services; its policies also serve as a foundation for the County's Development Regulations. In accordance with GMA, the Comprehensive Plan includes the required Land Use, Transportation, Housing, Capital Facilities and Utilities elements. Grant County's Comprehensive Plan also includes Economic Development, Essential Public Utilities, Intergovernmental Coordination and Natural Setting elements.

The Comprehensive Plan assigns land use designations to properties within the County to help guide future development. According to the Grant County Comprehensive Plan, the majority of the western portion of the *GCIA Employment Center* site is designated as Port of Moses Lake; land use within these areas is governed by the Port of Moses Lake's *Airport Master Plan*. The central and eastern portions of the site are designated as Industrial (Urban). See Section **3.7.1, Affected Environment**, for details on the intent of these land use designations.

Discussion: Development of the *GCIA Employment Center* site under Alternatives 1 and 2 would be consistent with and implement the land use designations for the site in Grant County's Comprehensive Plan, and would not require any amendments or modifications to the existing land use designations.

Grant County Land Use Code

Summary: According to the Grant County Zoning Districts (Chapter 23 of the Grant County Unified Development Code), the majority of the western portion of the *GCIA Employment Center site* is zoned Grant County International Airport and land uses within these areas are regulated by the Port of Moses Lake's Airport Master Plan. Areas in the central and eastern portions of the site within unincorporated Grant County are zoned as Urban Heavy Industrial (UHI). See **Section 3.7.1, Affected Environment**, for details on the purpose of these zoning classifications. Grant County also has an Airport Safety Overlay zoning district. The safety overlay is intended to protect the airspace around the airport from hazards as well as to protect the public's health, safety and general welfare. This overlay applies to any new buildings or structures that involve humans.

Discussion*:* Development of the *GCIA Employment Center* site under Alternatives 1 and 2 would convert the site from its existing primarily vacant, undeveloped condition to industrial and airport uses that would be consistent with the Grant County zoning classifications on the site.

Grant County Critical Areas Ordinance

Summary: The GMA (RCW 36.70A) requires all counties to identify critical areas within their jurisdictions and to formulate development regulations for their protection. Grant County defines and identifies critical areas in its Critical Areas and Cultural Resources chapter of the Grant County Unified Development Code (24.08). Grant County defines critical areas as wetlands, frequently flooded areas, critical aquifer recharge areas, geologically hazardous areas, fish and wildlife habitat conservation areas, and cultural resource areas (Unified Code 24.08). The relevant critical areas are defined below.

- **Frequently flooded areas** - those areas represented on FEMA's Flood Insurance Rate Maps for the county as within the 100 year floodplain or within the flood hazard management plan adopted by the Grant County Board of Commissioners.
- **Critical aquifer recharge areas** - those areas that have a "critical recharging effect on aquifer use for potable water in community systems" that include wellhead protection areas (WAC 246-290-135(4)), groundwater contribution areas (WAC 246-291-100(2)(e)), and areas identified by the Soil Survey of Grant County as having high potential for aquifer recharge (Unified Code 24.08).
- **Geologically hazardous areas** - defined as in WAC 365-190-080(4) and include erosion hazards, landslide hazards, mine hazards and seismic hazards.
- **Fish and wildlife habitat conservation areas** - defined as those areas where state and federal endangered or threatened species exists, and where state sensitive, candidate or monitor species have a primary association. This designation also includes Priority Habitat and Species Areas identified by the Washington State Department of Fish and Wildlife, habitats and species of local importance, naturally occurring pools under 20 acres, waters of the state (WAC 222-16), water bodies

planted with game fish by a government or tribal authority and/or areas with anadromous fish species (see Unified Code 24.08 for more details).

- **Cultural resource areas** - those areas that have been identified as having lands, sites and structures that have historic or archaeological significance (Unified Code 24.08).

Discussion: The *GCIA Employment Center* project would be consistent with all Grant County policies and regulations concerning critical areas. See Section 3.1**, Earth**, Section 3.3, **Water Resources**, Section 3.4, **Plant and Animals**, and Section 3.9, **Historic and Cultural Resources**, for descriptions of critical areas on and in the vicinity of the site, potential impacts on these critical areas with proposed development and mitigation measures to address any significant impacts on critical areas.

City of Moses Lake

City of Moses Lake Comprehensive Plan

Summary: The City of Moses Lake Comprehensive Plan (adopted in 2001 and last updated in 2014) was completed in compliance with the Washington State GMA and the Grant County Countywide Planning Policies. The Plan establishes goals and policies which guide future land use and coordinate growth within the City and its planning area over a 20-year planning horizon. In particular, the Comprehensive Plan serves as a guideline for designating land uses, infrastructure development and community services; its policies also serve as a foundation for the City's Development Regulations. In accordance with GMA, the Comprehensive Plan includes the required Land Use, Housing, Utilities, Transportation and Capital Facilities elements, as well as Essential Public Facilities and Roles and Responsibilities elements.

The Comprehensive Plan assigns land use designations to properties within the City of Moses Lake to help guide future development in the City. According to the City of Moses Lake Future Land Use Map, areas within the eastern portion of the *GCIA Employment Center* site are designated as Industrial and Public Facilities. See **Section 3.7.1, Affected Environment**, for details on the intent of these designations.

Discussion: Development of the *GCIA Employment Center* under Alternatives 1 and 2 would be consistent with and implement the land use designations for the site in the City's Comprehensive Plan, and would not require any amendments or modifications to the existing land use designations.

City of Moses Lake Land Use Code

Summary: According to the City of Moses Lake Zoning Ordinance (Title 18 of the City of Moses Lake Municipal Code [MLC]), the areas within the eastern portion of the *GCIA Employment Center* site are zoned as Heavy Industrial (HI) and Public (P). See **Section 3.7.1, Affected Environment**, for details on the purpose of these zoning classifications.

Discussion: Development of the *GCIA Employment Center* site under Alternatives 1 and 2 would convert the site from its existing, primarily vacant, undeveloped condition to industrial and airport uses that would be consistent with the City of Moses Lake zoning classifications on the site.

City of Moses Lake Critical Areas Ordinance

Summary: The Washington State Growth Management Act (RCW 36.70A) requires all cities to identify critical areas within their jurisdictions and to formulate development regulations for their protection. The City of Moses Lake defines and identifies critical areas in its Resource Lands Critical Areas section of the City of Moses Lake Municipal Code (MLC 19.03). "Critical areas" are defined within the MLC as one or any combination of areas that include "wetlands, aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas" (MLC 19.03). The critical areas that are relevant to the *GCIA Employment Center* site are discussed below.

- **Aquifer recharge areas** - those areas that are critical and at risk to contamination from intensive land uses.
- **Frequently flooded areas** - those that have a 1 percent or more risk of experiencing a flood in any given year identified on FEMA Flood Insurance Maps.
- **Geologically hazardous areas** - those areas not well suited for development (commercial, residential or industrial) because they are susceptible to erosion, landslides, earthquakes or any other geologic hazard event. This includes erosion hazard areas (vulnerable to erosion because of natural characteristics or human activities), landslide hazard areas (vulnerable to landslides because of geologic, topographic and/or hydrologic characteristics), and seismic hazard areas (vulnerable to severe damage from earthquakes).
- **Fish and wildlife habitat conservation areas** - those areas that serve as a vital habitat for locally important species, such as riparian ecosystems and naturally occurring ponds. This category also includes primary habitats for rare, threatened or endangered species (MLC 19.03).

Discussion: The *GCIA Employment Center* project would be consistent with all City of Moses Lake policies and regulations concerning critical areas. See Section 3.1**, Earth**, Section 3.3, **Water Resources,** and Section 3.4, **Plant and Animals**, for descriptions of critical areas on and in the vicinity of the site, potential impacts on these critical areas with proposed development and mitigation measures to address any significant impacts on critical areas.

Grant County International Airport Master Plan and Airport Overlay Zoning

Summary: In October of 2005, the most recent version of the *Grant County International Airport Master Plan* was approved by the Port of Moses Lake. The *2005 Airport Master Plan* identified the potential airport facility needs over the next 20 years and outlined the direction for the future development of the airport. In addition, new areas were identified for landside development, as well as infill development opportunities in existing areas. The On-Airport Land Use Plan within the *2005 Airport Mater Plan* identified proposed land uses for existing vacant areas within the Port of Moses Lake Grant County International Airport property, including aviation dependent and aviation-related uses in the east airport area (immediately east of the runway areas, and including the *GCIA Employment Center* site), potential acquisition areas for aviation dependent uses further to the east and non-aeronautical commercial/industrial uses to the northeast and southeast. See **Section 3.7.1, Affected Environment**, for details on the *2005 Airport Master Plan*.

In June 2014, the Port of Moses Lake completed a draft of their most recent update to the *Grant County International Airport Master Plan (2014 Airport Master Plan)* which is currently awaiting formal approval by the FAA. The intent of the *2014 Airport Master Plan* is to provide guidance for further development and identify development priorities. Proposed land use designations in the *2014 Airport Master Plan* are broken down into three categories: Airfield Operations, Aviation Development and Revenue Support. See **Section 3.7.1, Affected Environment**, for details on the proposed update to the Airport Master Plan.

Based on the 2014 *Airport Master Plan*, the *GCIA Employment Center* site includes Airfield Operations areas in the western portion of the site (adjacent to the existing runway areas). Aviation Development areas are also located in the western portion of the site, as well as near the north and south boundaries of the site, adjacent to the Airfield Operations areas to provide access for aircraft uses. An area for Revenue Support uses is located in the central portion of the site.

Discussion: Future proposed development on the *GCIA Employment Center* site under Alternatives 1 and 2 would be consistent with the existing and proposed update to the *Grant County International Airport Master Plan*.

3.8 AESTHETICS/LIGHT AND GLARE

This section of the DEIS describes the aesthetic and light/glare-related conditions on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the EIS alternatives are evaluated and mitigation measures identified.

3.8.1 Affected Environment

Regulatory Context

The Grant County Unified Development Code and the City of Moses Lake Municipal Code contain regulations to minimize negative impacts on aesthetics from new development, including standards for: structure height, structure site coverage, separation of buildings, landscaping and visual screening (see Section 3.7.5, **Relationship to Plans and Policies,** for details on applicable site development regulations).

Visual Character

The visual character of an area consists of the unique and important aesthetic features that comprise the visual landscape. Both natural and built features combine to define a location's visual character, including natural resources (topography, vegetation, geologic formations, wetlands, rivers and other water resources), view corridors, vistas, parks, and landmark structures/districts. Following are descriptions of important natural and built features, historic structures and views on and in the vicinity of the *GCIA Employment Center* site.

Natural and Built Features

Site

The *GCIA Employment Center* site is primarily vacant and undeveloped. The site is largely covered by native shrub-steppe vegetation with a mix of sagebrush and grasses (see Section 3.4, **Plants and Animals**, and **Appendix B** for details). The eastern portion of the site is more vegetated than the western portion. The site is generally level, with a slight gradual slope from the west to the east. There is an elevation change of approximately 50 feet from the highest point near the western edge to the lowest point near the east/southeast portion of the site (see **Figure 2-4** for a depiction of existing site conditions). No water resources are present on site; the nearest water feature is Crab Creek, approximately 0.5 mile to the east of the site.

A total of nine buildings are located on the site and contain approximately 342,000 square feet of building area. The existing buildings are primarily one-story buildings and are generally in industrial uses. The majority of the existing buildings are located in the western portion of the site, near the existing GCIA operations. Existing paved roadways also pass through the site, including Randolph Road NE, Tyndall Road NE, Road 7 NE and Turner Street (see **Figure 2-4** for a depiction of existing site conditions)

Site Vicinity

The *GCIA Employment Center* site is located on and adjacent to the Port of Moses Lake and the GCIA. The site is situated in Grant County, the City of Moses Lake, and along the east edge of the Port property. The visual character of the site vicinity is generally comprised of undeveloped areas and rural uses, with development sporadically located surrounding the site. Industrial buildings are situated within out-parcels (parcels that are not part of the proposed project) located in the central portion of the site; residential and agricultural uses are present to the north, west and south; and institutional uses are located to the southwest. The predominant built visual features in the area include the GCIA, as well as Big Bend Community College.

The out parcels in the central portion of the site primarily contain industrial structures associated with Genie Industries, Moses Lake Industries and the SGL/BMW Automotive Carbon Fiber Plant. These structures are typically two- to three-stories in height and generally reflect their industrial operations.

The area to the north of the site is generally comprised of undeveloped, naturally vegetated areas. Low-rise (one- to two-story) industrial structures are located further to the northwest, beyond the GCIA runway areas. Rural residential development (one- to two-story single family residences on large lots) and agricultural uses are also located further to the north.

The area to the east of the site (beyond Stratford Road NE) is primarily characterized by undeveloped, vegetated and agricultural areas. The Grant County Public Utility District (PUD) – Larson Substation is located in this area and includes electrical distribution facilities and lines. To the immediate southeast are industrial structures (one- to two-story structures and facilities) associated with the Consolidated Disposal Services Recycling and Transfer Center and AAA Readymix Concrete operations. Single family residential development is located further to the southeast, including the Stratford Road Estates subdivision that is currently under construction; existing homes that have been completed in Stratford Road Estates are primarily one- to two-story residences.

The area to the south of the site is defined by industrial uses associated with the Larson Sewage Treatment Plant and the Moses Lake Terminals tank farm. Further to the south, the visual character consists of agricultural uses, naturally vegetated areas and rural residential uses (primarily one and two-story single family residences).

The area to the west of the site is defined by the GCIA, including runways taxiways, roadways, the GCIA Terminal, hangars and other operations areas. Further to the west and southwest are buildings associated with Federal Express shipping operations, the Columbia Basin Job Corps Center and Big Bend Community College; these buildings are primarily one-and two-story structures (see Section 3.7, **Land Use**, for further information on existing land uses surrounding the site).

Historic Structures

There are no register-listed historic properties within a ten-mile radius of the *GCIA Employment Center* site. One recorded historic structure is located within the site. The structure is a drainage ditch in an undeveloped field adjacent to the Alert Center in the southeastern portion of the site, which was used either for storm drainage or to drain water used in extinguishing fires that might occur on the base. The ditch was determined not eligible for the National Register of Historic Places (NRHP).

Although the number of structures within the site is small, development on land in the area following closure of the Larson Air Force base has been minimal and existing structures are likely to be historic (i.e., at least 50 years old). These structures are associated with air base and aviation development and operations during World War II and the Cold War and may meet NRHP eligibility (see Section 3.9, **Historic and Cultural Resources**, and **Appendix H** for details).

Views

Because of the generally level topography of the site and surrounding area, views to the site are primarily limited to adjacent areas of similar elevation (e.g., public roads passing through the site). The site is generally not visible from more distant areas. There are no publicly identified viewpoints or vistas on the site or in the immediate site vicinity.

Light and Glare

The *GCIA Employment Center* site is primarily undeveloped and contains very few sources of light and glare. Existing light and glare sources consist of interior and exterior building lighting associated with the nine existing buildings on the site, parking lot lighting, and lighting on vehicles traveling to and from the site.

Current lighting conditions in the site vicinity reflect the largely rural nature of the area. Lighting sources primarily include interior and exterior building lighting associated with airport, industrial and residential uses, as well as vehicular lights traveling through the site area. The most prominent sources of light adjacent to the *GCIA Employment Center* site are vehicular headlights traveling along Stratford Road NE. Existing sources of glare in the site vicinity include certain exterior building surfaces, paved roadways and vehicles travelling through the site area.

3.8.2 Impacts of the Alternatives

Alternatives 1 and 2

This section describes changes to the visual character (natural and built features, historic structures and views) and light and glare that could occur with full development of the *GCIA Employment Center* site. As explained in **Chapter 2** of this DEIS, a conceptual land use map has been prepared which presents a concept illustrating how the site could potentially be developed in the future, assuming no changes to the site's land use classifications, and proposed land uses that represent uses that realistically could be expected to develop on the site given the site's unique setting adjacent to the Grant County International Airport. At this point in the process there are no specific development plans or defined building locations/designs proposed for the site. It is assumed that Alternatives 1 and 2 would include similar infrastructure systems, including roadway networks and utilities. However, the mix and location of land uses (and associated buildings) would differ under the alternatives.

Visual Character

Natural and Built Features

As indicated above, Alternatives 1 and 2 were developed to demonstrate and evaluate a range of uses and densities that could occur on the site, based on the existing Comprehensive Plan designations and zoning classifications for the *GCIA Employment Center* site. Because the actual location and design of buildings cannot be specifically determined at this point in the *GCIA Employment Center* development process, the exact visual character of ultimate development on the site cannot be depicted. However, it is anticipated that new development on the site under Alternatives 1 and 2 would change the aesthetic character of the site from its primarily undeveloped, naturally vegetated condition to a new employment center focused on aerospace and manufacturing uses. Under Alternatives 1 and 2, aviation development uses are assumed to be located in the western portion of the site and industrial uses (heavy manufacturing/warehousing or light manufacturing/technology, respectively) in the central and eastern portions of the site.

Under Alternatives 1 and 2, the visual character of potential new buildings on the site would generally reflect their aviation and industrial uses, and the buildings could be visually similar to existing development at the adjacent airport or adjacent industrial uses (e.g., Genie Industries, Moses Lake Industries and the SGL/BMW Automotive Carbon Fiber Plant). Building heights at the proposed development would be regulated by existing land use regulations (e.g., Grant County Unified Development Code, City of Moses Lake Municipal Code and GCIA Master Plan, and would generally be one to three stories in height. As a result, significant visual impacts are not anticipated under Alternatives 1 and 2.

Under Alternative 1, it is assumed that approximately 174 acres (14 percent) of the site would be in pervious areas, including natural areas and new landscaping; under Alternative

2 it is assumed that approximately 251 acres (20 percent) of the site would be in pervious areas. With its emphasis on light manufacturing and technology, it is anticipated that Alternative 2 could be developed in a business park configuration which could allow for more landscaping on the *GCIA Employment Center* site than Alternative 1.

New landscaping would be provided onsite as part of proposed development that would meet or exceed Grant County's, City of Moses Lake's and Port of Moses Lake's landscape requirements. Landscape areas would likely be provided along the site boundaries and along major roadways. New landscaping provided near primary access points (i.e., Tyndall Road NE/Stratford Road NE, Road 7 NE/Stratford Road NE, Randolph Road NE/Tyndall Road NE) could create a visually appealing entrance to the *GCIA Employment Center* site. Landscaping could also be provided around new parking areas and buildings to enhance the visual character of internal site areas. Landscaping plans would be developed for individual properties and would be reviewed and approved by Grant County, the City of Moses Lake, and/or the Port.

Historic Structures

One historic structure, a drainage ditch at the Alert Center, has been recorded within the site, but was determined not eligible for the NRHP. Therefore, development under Alternatives 1 and 2 would not generate impacts to previously recorded historic sites. Demolition, removal or other physical alteration of any structures over 50 years old would impact historic sites. To address this impact, the historical significance of structures within the site that are over 50 years old would be documented and evaluated prior to specific development actions (see Section 3.9, **Historic and Cultural Resources**, and **Appendix H** for details).

Views

As indicated previously, actual building locations, footprints, designs and heights cannot be specifically defined at this point. Maximum building heights and the amount of site coverage on the site would be controlled by provisions of the Grant County Unified Development Code, the City of Moses Lake Municipal Code and the GCIA Master Plan (see Section 3.7.5, **Relationship to Plans and Policies**, for discussion on current provisions related to building height and site coverage). If future applications for development call for buildings above the maximum heights currently allowed by code and analyzed in this EIS, additional environmental review may be warranted.

The height and scale of buildings on the site would also be a function of the type of use the building is designed to house. For example, buildings designed to house manufacturing and warehousing type uses would typically be more efficiently housed in buildings that are one to two stories in height with large floor plates; buildings of this height allow for manufacturing, warehousing and loading functions to be located on the same level. Buildings designed for technology use could be designed as multi-story structures (up to three stories). Accordingly, it is assumed that buildings housing manufacturing and/or warehousing uses would be one to two-stories in height and buildings housing technology uses could be slightly taller (up to three stories).

Because of the relatively flat elevation of the majority of the area surrounding *the GCIA Employment Center* site, the potential for view impacts on surrounding uses of proposed development would be limited. Views of the site from adjacent surrounding areas (particularly public roads) would include new buildings that could be similar to existing airport and industrial buildings on the site; however, new development under Alternatives 1 and 2 would represent an overall intensification of airport-related and industrial development on the *GCIA Employment Center* site.

Light and Glare

Under Alternatives 1 and 2, new temporary sources of light and glare would be introduced to the site during construction activities over the 20-year build-out period for the *GCIA Employment Center*. These light and glare sources would be associated with infrastructure and building construction, trucks and other equipment. Lighting associated with construction activities would be controlled by Grant County and City of Moses Lake regulations which limit the hours of construction, and thereby limit construction lighting during nighttime hours (see Section 3.6, **Noise**, and **Appendix G** for further discussion of limits on construction activities). Given the distance of a majority of construction activity on the site from residential uses in the area, light and glare impacts during construction are not expected to be significant.

New site development under Alternatives 1 and 2 would add a variety of sources of light to the site including: interior and exterior building illumination, vehicular headlights, parking area lighting and street lighting. The *GCIA Employment Center* site development would increase the overall level of nighttime lighting in the area. Nighttime site lighting could be perceived at adjacent properties; however, new lighting on the site would be designed in accordance with applicable Grant County, City of Moses Lake and Port of Moses Lake lighting standards, and significant light impacts are not anticipated.

New sources of glare from the site under Alternatives 1 and 2 could include reflection from building facades and windows, and reflections from automotive and truck traffic. Specific glare impacts would depend upon the amount of reflective surfaces (e.g., glass windows and metal building surfaces) used. It is anticipated that manufacturing and warehouse buildings would generate low levels of glare, and technology buildings could generate somewhat more glare due to greater extent of glazing. The amount of glare generated would be typical of industrial and business park development and significant glare impacts are not anticipated.

Alternative 3

Under Alternative 3, the No Action Alternative, no new development would occur on the *GCIA Employment Center* site and no impacts to aesthetic and visual conditions would occur at this time and no additional light/glare would be generated. The site would remain in its existing primarily undeveloped, naturally vegetated condition.

3.8.3 Mitigation Measures

The following required/proposed mitigation measures address the potential aesthetics/light and glare impacts that could result from the construction and long-term use of Alternatives 1 or 2.

Required/Proposed Mitigation Measures

- The development of the *GCIA Employment Center* under Alternatives 1 and 2 would be consistent with the existing zoning classifications for the site and new development would be designed to meet the applicable requirements of the Grant Count Unified Development Code, the City of Moses Lake Municipal Code and GCIA Master Plan including requirements to minimize negative impacts on aesthetics from new development (e.g., maximum building height, building site coverage, separation of buildings, landscaping and visual screening).

- A Development Agreement could be executed between the County, Port, City and other property owners at the site. This agreement could specify the standards and conditions that would govern development of the site.

- A Master Plan could be developed for the site for review and approval by the County, Port and City. This plan would contain more definitive information on site development, infrastructure, parking, and landscaping, and could represent a more cohesive, predictable concept for development of the site.

3.8.4 Significant Unavoidable Adverse Impacts

Development under Alternatives 1 and 2 would change the aesthetic character of the *GCIA Employment Center* site from its primarily undeveloped, vegetated condition to a new employment center focused on aerospace and manufacturing uses. New sources of light and glare would be generated from the site with development. No significant unavoidable adverse aesthetic/light and glare impacts are anticipated with adherence to applicable zoning requirements for the site.

3.9 HISTORIC AND CULTURAL RESOURCES

This section of the DEIS describes the existing historic and cultural resource conditions on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the DEIS alternatives are evaluated and mitigation measures identified. This section is based on the Historic and Cultural Resources Report (May 2015) prepared by Cultural Resource Consultants, Inc. (see **Appendix H**).

3.9.1 Affected Environment

The historic and cultural resources analysis is based on: review of previous ethnographic, historical, and archaeological investigations in the local area; a records search at the Washington State Department of Archaeology and Historic Preservation (DAHP) for known sites in the immediate area; a review of relevant background literature and maps; and a site visit in April 2015. Cultural resource staff of the Wanapum, Colville and Yakama tribes was also contacted. No responses from these tribes have been received to date.

Cultural Resources

Regulatory Context

Several Washington state laws that specifically address identification and protection of cultural resources would pertain to development of the *GCIA Employment Center* site (e.g., RCW 27.44, RCW 27.53), and compliance with the Washington State Environmental Policy Act (SEPA)). The Archaeological Sites and Resources Act (RCW 27.53) prohibits knowingly excavating or disturbing archaeological sites without a permit issued by DAHP. The Indian Graves and Records Act (RCW 27.44) prohibits knowingly destroying Native American or historic graves.

Natural Environment

The *GCIA Employment Center* site and vicinity are situated on the Columbia Plateau in the Columbia Basin physiographic province near the eastern edge of the Quincy hydrographic basin. The region includes several ecological habitats dominated by shrub-steppe, characterized by hot summers with light precipitation and cool winter temperatures. Moses Lake, located 1.75 miles southwest of the site, was historically a shallow natural lake and its water levels have been raised to support irrigation. The stream east of the site, Crab Creek, is labeled “Willow Creek” on early twentieth century topographic maps. Twentieth century developments including the Columbia Basin Irrigation Project have altered hydrology and vegetation communities in the Moses Lake area by recharging paleolakes, seeps, waterways, and wetlands, and increasing the elevations of lake and river surfaces.

The project site is located in the central portion of the Columbia Basin physiographic province. Flood-deposited gravels sitting atop basalt bedrock form the general subsurface profile of the site (see Section 3.1, **Earth**, and **Appendix A** for details). The surface geologic and soil units in the area indicate that deposition following the latest Pleistocene floods has been minimal and any archaeological material would be expected to occur above the flood deposits very near the present-day ground surface and not deeply buried (see **Appendix H** for details on the natural environment on and in the vicinity of the site.)

Archaeological Context

Recent investigations indicate the presence of humans in northwestern North America dating to 14,000 years ago. Human occupation of the Columbia Basin region has been archaeologically dated to approximately 12,000 years BP (before present) and is described by several phases of cultural development. The general pattern of human adaptation in the region appears to exhibit a change through time from an upland hunting strategy to a semi-sedentary riverine-based subsistence organization. This change broadly occurred between an earlier tradition comprised of several phases and a subsequent, two phase tradition: Frenchman Springs and Cayuse.

The division between the two broad traditions is marked by the archaeological appearance of several apparent innovations. Pithouses are first recognized during this time; other artifacts, such as those suggestive of resource intensification (ground stone mortars, pestles and net sinkers), appear as well. Also apparent is increased variation in stone-working technology, decline in the predominance of basalt and the appearance of small stemmed and larger notched projectile points. Archaeological evidence of a riverine-based residence pattern, supported by seasonal camps at upland locations, appears to correspond with the ethnographically observed Plateau pattern. The earliest manifestations of this residence pattern are present by about 4,500 years ago.

The Plateau winter village pattern noted in ethnographic literature appears to have been established by 2500 BP. The Plateau subsistence model indicates a pattern of riverine settlement, a reliance on riverine and root resources, the development of complex fishing technologies and the extension of trading patterns and extension of apparent political links. An increase in the frequency of net sinkers suggests a multifaceted economy emphasizing large-scale fishing, and possibly organized into inter-village groups. Projectile points dated to the Cayuse period are generally smaller, with notching occasionally added to the chipped triangular form. Bow and arrow technology appears to be widespread by about 2000 years BP. Cultural traditions established by the onset of the Cayuse phase appear to persist with little variation to the contact era, about 200 years ago, when disruptions associated with the Euro-American presence in the region resulted in a breakdown of traditional social patterns (see **Appendix H** for details the archaeological context of the site and vicinity.)

Ethnographic Context

The *GCIA Employment Center* site lies within the traditional territory of the Sinkayuse or Moses Columbia Tribes, which are Middle Columbia River Salishan people recognized as constituent tribes of, and today represented by the Confederated Tribes of the Colville Reservation (CTCR). The Sinkayuse shared many broadly defined traditions with other Middle Columbia River Salishan groups, including: lacustrine or riverine settlement patterns;

subsistence emphasis on salmon and other fish, land game and a wide variety of abundant vegetable foods; and household and village communities linked by family and exchange relations.

The Sinkayuse occupied the area east of the Big Bend of the Columbia River with their main village at Rock Island (about 40 miles northwest of the project site). The Moses Lake area was used in spring and summer for gathering a variety of resources. The Sinkayuse and neighboring groups such as the Wanapum dug for root vegetables, including camas, biscuitroot and bitterroot, near the south end of Moses Lake, between Moses Lake and Coulee City, and in the Ephrata area. In the summer, groups of Sinkayuse camped at Moses Coulee, Grand Coulee and Moses Lake. Moses Lake was known as a good place to hunt ducks and geese and collect their eggs.

Sinkayuse settlements in the Moses Lake area included ta’aγasik, “turtle place;” nqiyxʷátkʷ, “stinking water;” siálĭlaqən, “spring;” and squγátqu, “narrow channel”. Each of these was located near the northeastern shoreline of Moses Lake, within approximately 1 to 5 miles of the *GCIA Employment Cente*r site. Smohala and his band frequently camped near the lower end of Moses Lake at a place called Tamewikes, and Chief Moses is reported to have camped near a spring on the west side of Rocky Ford Creek. These camps were over five miles south and west of the site, respectively. The Rocky Ford camp, called Entepasneut or Entopas-Noot, was known throughout the region and beyond as a trading post, with bands traveling from as far away as the Great Plains and Rocky Mountains to trade buffalo, horses, deer, roots and salmon among other goods (see **Appendix H** for details on the ethnographic context of the site and vicinity.)

Historic Resources

Designated landmarks are those properties that have been recognized locally, regionally or nationally as significant resources to the community, city, state or nation. Recognition may be provided by listing in the National Register of Historic Places (NRHP) or the Washington Heritage Register (WHR) through a nomination process managed by the DAHP; or by listing as a local landmark. Typically, a property is not eligible for consideration for listing in the NRHP or WHR until it is at least 50 years old.

Historic Context

The site is situated within the ceded lands of the Confederated Tribes and Bands of the Yakama Nation under the terms of the Yakama Treaty signed at Walla Walla in 1855. In 1879, in response to Chief Moses’ request for a separate home for his people, the Columbia Reservation was established west of the Okanogan River. However, this reservation did not include any traditional Sinkayuse lands. Chief Moses and other leaders relinquished the reservation in 1883, moving instead to the Colville Reservation.

The General Land Office (GLO) survey mapping does not show any cultural features, such as trails, roads, residences, villages or homestead improvements in or adjacent to the site. The nearest cultural feature is the "Road from White Bluffs to Lake Chelan" that passes within two miles to the southwest of the site. An "Indian Camp" and spring are noted about seven miles to the northwest. Euro-American land use in the area in the late nineteenth century likely consisted of cattle or sheep grazing. By the early twentieth century, the area between Moses Lake and Crab Creek formed the only remaining undisturbed stock district east of the Columbia River.

GLO records indicate that Euro-American settlement at the site was sparse and the first individual land claims were not filed until the 1910s. Two parts of the site were deeded to the Northern Pacific Railroad Company in 1896 and 1916, respectively. The towns of Neppel and Moseslake were established on the east side of Moses Lake and another community, Mae, developed west of the lake. Neppel, which was located along a Chicago, Milwaukee and St. Paul Railroad spur beginning in 1905, was incorporated as Moses Lake in 1938. Originally part of Douglas County, established by the Washington Territorial Legislature in 1883, Grant County was formed in 1909. Farms and orchards were successful near local watercourses but had limited potential on drier uplands such as the site and vicinity. Beginning in 1946, agriculture increased following construction of the Columbia Basin Irrigation Project, which featured canals such as the East Low Canal approximately three miles northeast of the site. Review of historical maps indicates that the site and vicinity was sparsely inhabited prior to development of the air base. Land use during this period likely included ranching and possibly farming.

Following the entrance of the United States into World War II, the U.S. Army opened the Moses Lake Army Air Depot in 1942 on a large tract of land encompassing the project site. The Moses Lake Army Air Depot was initially used as a training center for P-38 pilots and B-17 combat crews. At the end of the war, the base was put on standby status. Over the next few years, the main activity at the base was testing the B-47 and B-50 built by Boeing Aircraft Company.

In 1948, the base was reopened as a permanent installation with the mission of protecting Hanford Atomic Works, Grand Coulee Dam and the coast. In 1950, the base was re-designated Larson Air Force Base (AFB). Moses Lake/Larson AFB was operated by Air Defense Command (1948-1952), Tactical Air Command (1952-1957), Military Air Transport Service (1957-1960) and Strategic Air Command (1960-1964).

The base included the entire project site, and most of the land onsite was maintained as an undeveloped security buffer, with landscape modifications as needed to provide clear lines of sight around base facilities. The focus of operations was on aviation and nuclear arms, but activities also included training in use of heavy equipment. These activities were generally carried out in the undeveloped area east of the airport. Most base support facilities, such as housing, a hospital and administrative buildings, were developed between the south side of the airport and the north shore of Moses Lake.

In 1963, a base improvement program was implemented that demolished 104 buildings on the base and replaced them with more modern buildings. In spite of modernization efforts, Larson AFB was among the 80 defense installation closures in the continental U.S. in November 1964. The General Services Administration granted three hangars to Big Bend Community College and the runways and other aviation facilities to the Port of Moses Lake, which opened GCIA on the former base in 1966. The airport is classified as a Commercial Service Facility and has been used as a heavy jet training and testing facility by the Boeing Company (1950s to present), Japan Airlines (1960s to 2009), the U.S. Military and other air carriers. The 4,300-acre airport has four runways, the largest of which is 13,503 feet long (Runway 14L-32R). The runways are adjacent to the west side of the project site.

Some of the features of the present-day airport were built during its use by the Army and Air Force between 1942 and 1965, and Boeing Aircraft Company beginning in the 1940s. Original features of the base, constructed in 1942 and 1943, include two runways, each originally 500 by 10,000 feet; a parking apron 600 by 4,000 feet; and connecting 75-foot-wide taxiways. The base's primary and crosswind runways, both originally 500 feet wide, are now 200 feet and 100 feet wide, respectively (see **Appendix H** for details on the historic context of the site and vicinity.)

Previously Recorded Sites and Surveys

Cultural Sites

Ten cultural resource assessments have previously been prepared within a distance of approximately one mile of the project site; two prior cultural resources assessment included the site, and a third was adjacent to the site. Cultural resource investigations on file at DAHP within one mile of the *GCIA Employment Center* site are described in **Appendix H**. Most of these were archaeological and historic resource surveys for proposed road improvement projects. Pedestrian survey and shovel testing of a large tract of land west of the GCIA, just over one mile west of the project site but in a similar landform and depositional setting, identified several scatters of historic-era archaeological material but only one precontact artifact. Results of a pedestrian survey and shovel testing in an area west of the site were negative for archaeological and historic sites, and a cultural resources survey in an area bordering the site did not identify any historic period or precontact archeological material (see **Appendix H** for details).

As a result of these past and recent investigations, relatively few archaeological or historic sites have been identified in proximity to the site. The nearest archaeological sites are located one to two miles away from the site. These include seven historic period archaeological sites and one precontact isolate. Four of the sites are historic debris scatters or dumps and a fifth includes historic debris and unidentifiable structural remains, all of which were recommended not eligible for the NRHP. Two sites (a historic well and a historic road) have not been evaluated for NRHP eligibility. All of these sites are over a mile from the site. The nearest precontact archaological sites are over two miles west and southwest of the site near the present-day Moses Lake shoreline. These include a low density scatter of precontact lithic material and two precontact house pit sites on the Moses Lake shoreline over two miles southwest of the site.

Register-listed Historic Properties

There are no register-listed historic properties within a ten-mile radius of the project site. The nearest register-listed sites are the Bell Hotel and Grant County Courthouse in Ephrata approximately 13 miles to the northwest, and the Lind Coulee Archaeological Site approximately 20 miles to the southeast, outside the town of Warden. Several historic buildings have been inventoried within a quarter mile of the site (see Table 4 in **Appendix H**). These include former Larson AFB facilities such as single family homes built as military housing, drainage ditches and other infrastructure, a railroad branch line and a hangar. Historical significance of most of these resources was evaluated, with the majority of them determined not eligible for the NRHP. The Larson AFB In-Flight Kitchen was determined eligible for the NRHP.

One recorded historic structure is located within the project site. The structure is a drainage ditch in an undeveloped field adjacent to the Alert Center, which was used either for storm drainage or to drain water used in extinguishing fires that might occur on the base. The ditch was determined not eligible for the NRHP (see **Appendix H** for details on previously recorded sites and surveys).

Potential for Previously Unrecorded Historic and Cultural Resources

The DAHP statewide predictive model uses environmental data about the locations of known archaeological sites to identify where previously unknown archaeological sites are more likely to be found. The model correlates locations of known archaeological sites to determine the probability that, under a particular set of environmental conditions, another location would be expected to contain an archaeological site. Environmental data categories included in the model are elevation, slope, aspect, distance to water, geology, soils and landforms. The model assigns a probability ranking of “Survey Highly Advised: High Risk” for the majority of the site, with areas marked “Survey Highly Advised: Very High Risk along the site’s eastern edge. Precontact and early historic-period land use patterns suggest that the northeastern part of the study area, which is nearest to Crab Creek, would have a higher potential for archaeological resources.

Although the model suggests high archaeological potential for the project site, information derived from historical maps, photographs, geological maps, and other sources indicate that overall, the landscape of the site has a low potential to contain archaeological sites. Intact native soils are not expected to be present in the majority of the project due to the absence of depositional environments and the history of air base development and demolition that has disturbed broad areas of near-surface sediments. Development of the air base is also likely to have removed earlier historic archaeological materials, which could include remnants of livestock pens, homesteads, fence lines, domestic refuse or other evidence of residential or agricultural activity.

Although the number of standing structures within the site is small, development on land in the area following closure of the air base has been minimal and existing structures are likely to be historic (i.e., at least 50 years old). Comparison of historical and recent aerial imagery indicates that, with the exception of one office building recently added to the City of Moses Lake Gun Club, existing structures within the site date from the 1940s to 1960. These structures are associated with air base and aviation development and operations during World War II and the Cold War and may meet NRHP eligibility criteria.

Observations during field reconnaissance for this EIS were consistent with expectations for a low potential for archaeological sites to be present due to geomorphic setting and past impacts to surface and near-surface sediments in the majority of the site. The ground surface in the portion of the site north of the SGL facility and east of Randolph Road appeared to have been subjected to less ground disturbance in the past than other areas.

Based upon review of historical air photos online and on file at ASPI Group in Renton, Washington, recent air photos, DAHP's historic inventory and field observations, historic structures are present within the site that have not been previously inventoried. These include: Taxiway G, the gun revetment east of Taxiway G, the gun range on City of Moses Lake property, the Boeing facility on the east site of the airport, the SAC Alert Center and the alert hangar and apron currently used by Columbia Pacific Aviation (see Table 5 in **Appendix H**). These structures should be inventoried and formally evaluated for NRHP eligibility prior to initiation of any development.

Resources are typically defined as significant or potentially significant if they are identified as of special importance to an ethnic group or Indian tribe or if the resource is considered to meet certain eligibility criteria for local, state or national historic registers, such as the NRHP. Based on NRHP assessment criteria developed by the National Park Service, historical significance is conveyed by properties:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period or method of construction or that represent the work of a master, or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important in prehistory or history.

According to the NRHP guidelines, the "essential physical features" of a property must be intact for it to convey its significance, and the resource must retain its integrity, or "the ability of a property to convey its significance." The seven aspects of integrity are:

- Location (the place where the historic property was constructed or the place where the historic event occurred);
- Design (the combination of elements that create the form, plan, space, structure and style of a property);
- Setting (the physical environment of a historic property);
- Materials (the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property);
- Workmanship (the physical evidence of the crafts of a particular culture or people during any given period of history or prehistory);
- Feeling (a property's expression of the aesthetic or historic sense of a particular period of time); and
- Association (the direct link between an important historic event or person and a historic property).

Several historic structures within the site area may meet NRHP Criterion A based upon association with significant events (e.g., World War II and Cold War era defense) or Criterion C based upon significant engineering or architectural features. These structures generally retain integrity of location, feeling and association but have varying levels of integrity of design, setting, materials and workmanship due to changes to the structures and their surroundings. These structures are discussed in greater detail in **Appendix H.**

3.9.2 Impacts of the Alternatives

This section identifies and analyzes impacts to historic and cultural resources on and in the vicinity of the *GCIA Employment Center* site with proposed development. Impacts under Alternatives 1 and 2 are expected to be similar; any differences between the alternatives are noted. For this analysis, the Area of Potential Impact is coincident with the site boundary.

Alternatives 1 and 2

Because the site is considered to have a low potential to contain intact archaeological deposits, no significant impacts to archaeological sites are anticipated with development under Alternatives 1 and 2. No precontact or historic period archaeological sites have been identified within the site. However, significant impacts to archaeological sites could occur if development disturbs as-yet unknown archaeological sites. Significant impacts to historic sites could be generated by demolition, removal or other physical alterations to historic structures.

A small portion of the *GCIA Employment Center* site has been surveyed for archaeological or historic sites. The two existing surveys of the site area were confined to the Randolph Road

NE and 7 Road NE corridors. No archaeological sites have been recorded within the site. One historic structure, a drainage ditch at the Alert Center, has been recorded within the site, but was determined not eligible for the NRHP. Therefore, development under Alternatives 1 and 2 would not generate impacts to previously recorded archaeological sites or significant impacts to previously recorded historic sites.

Development under Alternative 1 would result in approximately 8.8 million square feet of new buildings, requiring an estimated cut and fill of 2,731,640 cubic yards with an average depth of 2 feet. If as-yet unrecorded archaeological sites are present within the site, they would likely be on or near the present-day ground surface within the vertical limits of cut and fill or other ground-disturbing work such as trenching or building for utilities, transportation corridor construction, building foundations, stormwater management facilities, grading, grubbing with machines or planting. Demolition, removal, or other physical alteration of any structures over 50 years old would impact historic sites.

Under Alternative 2, development would include approximately 10.1 million square feet of new buildings, and the same amount of cut and fill as estimated for Alternative 1. Similar to Alternative 1, if as-yet unrecorded archaeological sites are present within the site they would be on or near the present-day ground surface within the vertical limits of cut and fill or other ground-disturbing work. Demolition, removal, or other physical alteration of structures over 50 years old would impact historic sites. Given the slightly higher density of development proposed under Alternative 2, it is somewhat more likely for as-yet unrecorded archaeological or historic sites to be impacted than under Alternative 1.

Alternative 3

Under the Alternative 3, the No Action Alternative, it is assumed no new development or infrastructure improvements would occur on the site at this time. The site would remain in its partially developed condition, and there would be no new temporary or permanent impacts on historic or cultural resources.

3.9.3 Mitigation Measures

The following required/proposed mitigation measures address the potential impacts to historic and cultural resources that could result from the construction and long-term use of Alternatives 1 or 2.

Required/Proposed Mitigation Measures

Prior to and During Construction

- Formal consultation with Tribes in Washington State would be initiated to determine which Tribes have an interest in the site.

- A protocol/checklist for review of projects that includes a form letter for DAHP would be established.
- Cultural resources surveys would be conducted prior to specific development actions.
- The historical significance of structures within the site that are over 50 years old would be documented and evaluated prior to specific development actions.
- Consideration would be given to establishing a team to manage the critical area designation of archaeological sites. The team could be responsible for data management and consultation with Tribes, agencies, developers and/or other stakeholders. A member of the team could be assigned to search for grants and other funding sources in order to begin collecting data to improve the understanding of precontact land use at the site.
- Consideration would be given to establishing a heritage program that would help guide development by incorporating a heritage theme in the *GCIA Employment Center*.
- Consideration would be given to partnering with existing businesses or agencies (e.g., Port of Moses Lake, ASPI Group) with a strong interest in history, and which likely maintain good historical records.
- Should any potentially significant archaeological or historic sites be encountered during development of the proposal that could not be avoided, impacts could potentially be minimized by measures including:
    - Limiting the magnitude of the proposed work;
    - Modifying proposed development through redesign or reorientation to minimize or avoid further impacts to resources;
    - Rehabilitation, restoration or repair of affected resources;
    - Preserving and maintaining operations for any involved significant historic structures;
    - Archaeological monitoring, testing or data recovery excavations; and/or
    - Documentation of historic elements of the built environment through photographs, drawings and narrative, at the appropriate level based upon DAHP standards.
- In the event that ground disturbing or other activities result in the inadvertent discovery of archaeological deposits, work would be halted in the immediate area and contact made with the DAHP. Work would be halted until such time as further investigation and appropriate consultation is concluded.
- In the unlikely event of the inadvertent discovery of human remains, work would be immediately halted in the area, the discovery covered and secured against further

disturbance, and contact made with law enforcement personnel, consistent with the provisions set forth in RCW 27.44.055 and RCW 68.60.055.

3.9.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts on historic and cultural resources are anticipated with implementation of the mitigation measures listed above.

3.10 TRANSPORTATION

This section of the DEIS describes the existing transportation systems and traffic operations on and in the vicinity of the *GCIA Employment Center* site. Potential impacts from development of the DEIS alternatives are evaluated and mitigation measures identified. The section was prepared by Heffron Transportation (see **Appendix C** to this DEIS for tables and figures to which this section refers).

3.10.1 Affected Environment

This section describes the existing transportation conditions and expected conditions in the future without the proposed actions within the project study area and site vicinity, including the roadway network, non-motorized transportation facilities, transit service, safety, traffic volumes and traffic operations.

Study Area

The study area for this analysis focuses on the near-site roadways and connections to State Route (SR) 17 (see **Figure 3.10-1).** Detailed traffic operations analysis was conducted for the following four intersections, which are unsignalized:

- Randolph Road NE/SR 17;
- Randolph Road NE/Patton Boulevard NE;
- Tyndall Road NE/Stratford Road NE (Road J NE); and
- Road 7 NE/Stratford Road NE (Road J NE).

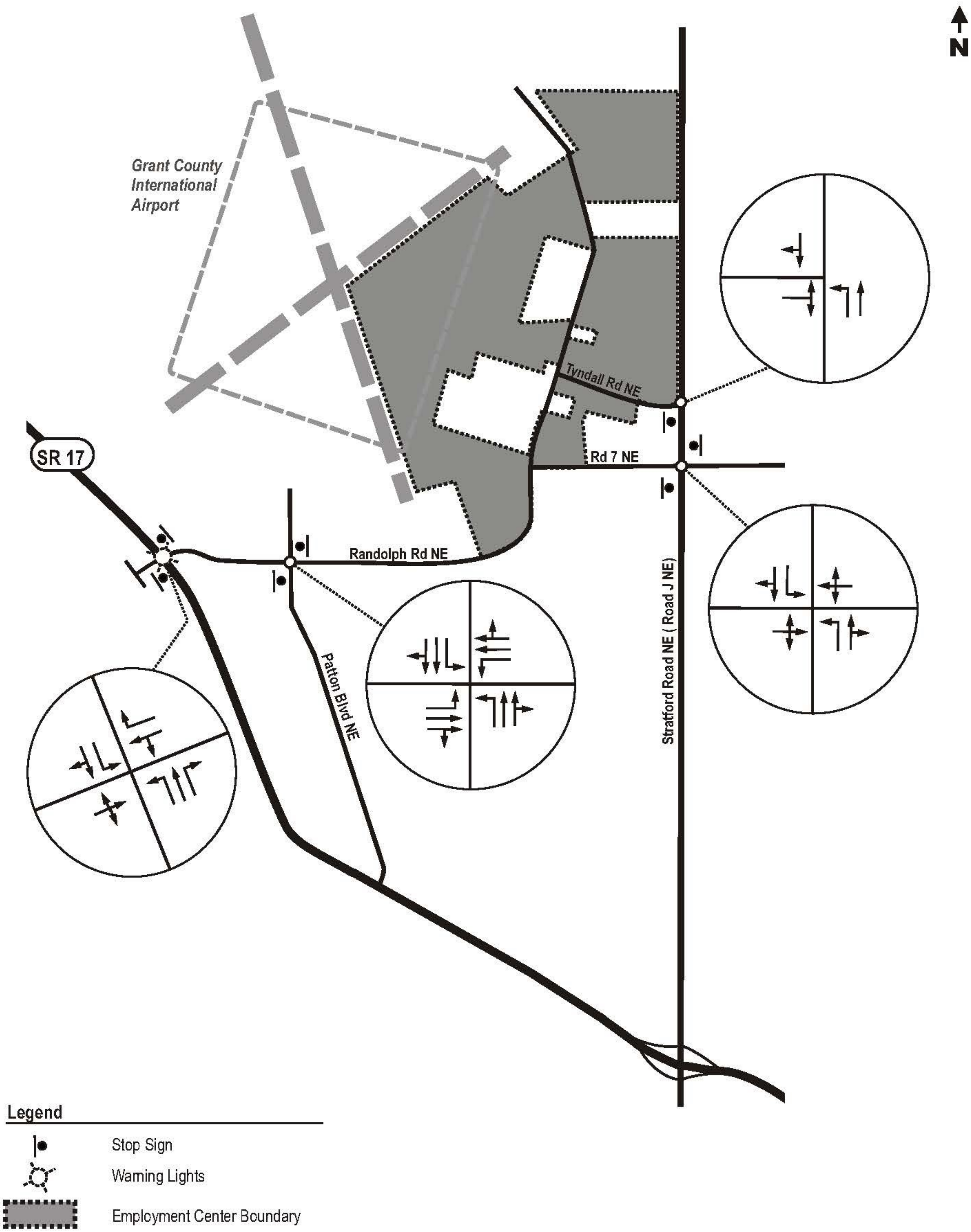
Street System

Existing Network

Access to and from the study area is primarily provided by Stratford Road NE (also called Road J NE) on the east and SR 17 on the west. The following key roadways are located in the project study area. The county roads in the study area are all-season roads and are not normally subject to seasonal load limitations.[1]

[1] Grant County All-Season Map, 2011.

Grant County International Airport Employment Center
Draft EIS



Source: Heffron Transportation, 2015.

EA Engineering, Science, and Technology, Inc., PBC

Figure 3.10-1

Transportation Study Area

Stratford Road NE (Road J NE) is a north-south roadway that connects SR 28, north of the site, to E Broadway Avenue in the City of Moses Lake, south of the site. In the city limits, it connects to SR 17 at a diamond interchange. Within the city limits, north of SR 17, it is a five-lane roadway with two travel lanes in each direction and a center-two-way-left turn lane. This segment has curbs on both sides of the street and intermittent sidewalks or paved/gravel paths. Between Kinder Road and the city limit, the posted speed limit is 30 miles per hour (mph).

North of Sagedale Road, outside of the city limits, Stratford Road NE narrows to three lanes (one travel lane in each direction and a two-way-left turn lane). This segment has paved shoulders on both sides of the roadway beyond which are curbs and unpaved walkways. The posted speed limit is 35 mph.

North of Harris Road NE (Road 5 NE), Stratford Road NE narrows to a two-lane roadway (one lane in each direction) with approximately eight-foot paved shoulders, and the speed limit increases to 55 mph. It widens to three lanes (with a two-way-left turn lane) between Road 7 NE and Tyndall Road NE.

Along Stratford Road NE north of SR 17, traffic flows freely and all side streets are controlled with stop signs.

SR 17 is a state highway that connects between Interstate-90 (I-90) in Moses Lake and SR 28 near Soap Lake. It is oriented southeast to northwest through the study area. Between Stratford Road NE and Patton Boulevard NE it is four lanes with six to eight foot shoulders. There is a jersey barrier separating the northbound and southbound lanes. SR 17 has two signalized intersections in the study area: one at Grape Drive NE and one at Patton Boulevard NE. On the approaches to each intersection there are signal warning signs that direct drivers to prepare to stop when flashing. The posted speed limit is 50 mph.

North of Patton Boulevard NE, SR 17 has two lanes with paved shoulders, and there is a rumble strip between the two lanes. At its intersection with Randolph Road, left-turn pockets are provided on the north and south legs. Randolph Road NE traffic is controlled by stop signs at this intersection, and there are flashing lights to warn advancing drivers (yellow flashing lights for SR 17 motorists, and red flashing lights for Randolph Road NE motorists). The posted speed limit is 60 mph.

Randolph Road NE extends from SR 17 on the south side of the GCIA to businesses on the northeast side of the airport. From SR 17 to Patton Boulevard NE, it has four lanes (two travel lanes in each direction). For a short stretch between 32nd Avenue NE and 30th Avenue NE, it has five lanes including a two-way left-turn lane. This segment has curbs, gutters and sidewalks on both sides. Between Patton Boulevard NE and 22nd Avenue NE, Randolph Road NE has three lanes (one lane in each direction with a two-way left-turn lane). East of 22nd Avenue NE it is two lanes with paved shoulders. There is a railroad crossing just east of 22nd Avenue, and warning signs at the approaches to the crossing. The posted speed limit to the west of 22nd Avenue NE is 35 mph, and to the east is 45 mph.

Tyndall Road NE connects Stratford Road NE to the businesses adjacent to the east side of the airport. It is a two-lane roadway. East of Randolph Road NE it has eight-foot wide shoulders. West of Randolph Road NE there is an eight-foot shoulder on the north side; on the south side, sections of the gravel shoulder are covered with brush and poorly delineated. Its intersection with Randolph Road NE is all-way stop-controlled. There is no posted speed limit.

Road 7 NE is a two-lane, east-west roadway that provides access between Stratford Road NE and Randolph Road NE. It is a two-lane roadway with four-foot shoulders on both sides. East of Stratford Road NE it extends to Road N NE. Its approaches with Stratford Road are stop-controlled, and there are rumble strips in the travel lanes on both approaches. There is no posted speed limit west of Stratford Road NE. The posted speed limit east of Stratford Road NE is 55 mph.

Patton Boulevard NE is a north-south roadway that extends from the GCIA's south access to SR 17. It is primarily a four-lane roadway with left-turn pockets at the intersections. In the vicinity of Endeavor Middle School, between Chanute Street NE and E Craig Street, it is five-lane roadway (two travel lanes in each direction and a two-way left-turn lane). South of Randolph Road NE there are sidewalks on the west side of the roadway and on the east side there are flat unpaved pathways. Parking is permitted on the west side of the roadway between E Craig Street and 22nd Avenue NE. North of Randolph Road NE, there are sidewalks on both sides of the roadway. On the west side of Patton Boulevard NE, just north of Randolph Road NE, there is a School Zone sign with a flashing beacon. There are pedestrian crosswalks across the north and west legs of the Patton Boulevard NE/Randolph Road NE intersection. The posted speed limit is 35 mph.

Future Roadway Improvements

Based upon review of the Grant County's Adopted Six Year Transportation Improvement Program (TIP) 2015 - 2020, no capacity improvement projects are currently programmed at study area intersections.[2] However, Grant County staff indicated that a 2014 *Safe Routes to School* Grant Application has been submitted to the Washington State Department of Transportation (WSDOT) to improve safety for middle school students walking and biking to Endeavor Middle School.[3] Improvements are planned at two intersections: Patton Boulevard NE/Randolph Road NE and Patton Boulevard NE/E Craig Street. At both intersections the crosswalks will be enhanced with a warning light system. Additional improvements at the Patton Boulevard NE/Randolph Road NE intersection include Americans with Disabilities Act (ADA)-compliant ramps and rapid flash beacons. Along Randolph Road NE on both sides of Patton Boulevard NE, School Zone speed limit signs with

[2] Grant County, 2015-2020 Transportation Improvement Program, July 22, 2014.
[3] 2014 Safe Routes to School Grant Application Form, September 29, 2014.

flashing beacons will be added. These are similar to the existing sign on the west side of Patton Boulevard NE just north of Randolph Road NE.

Traffic Volumes

Existing Traffic Volumes

Turning movement vehicle counts were conducted at the four study intersections to understand traffic patterns during periods when traffic volumes near the site are the highest. In addition to counts of the AM and PM peak commuter periods, the PM count at the Randolph Road NE/Patton Boulevard NE intersection was conducted from 2:00 to 5:30 PM to include school traffic generated by Endeavor Middle School. The turning movement counts were conducted by IDAX Data Solutions on Tuesday, March 10, 2015. The existing (2015) AM and PM peak hour volumes at the study intersections are shown on **Figure 3.10-2**.

Daily traffic volumes (24-hour counts) were conducted by IDAX on Stratford Road NE just south of Road 7 NE on Tuesday, March 10, 2015. Figure 1 in **Appendix C** shows how weekday traffic fluctuates by hour. There are noticeable directional peaks throughout the day with northbound traffic peaking early in the morning around 5:00 AM and southbound traffic peaking in the afternoon at about 4:00 PM The PM peak hour volume (a total of about 560 vehicles) is about 65 percent higher than the AM peak hour volume (about 340 vehicles).

The traffic count data recorded 13 classifications of vehicles, which are defined by their axle configuration. These classifications have been grouped into three categories: passenger-type vehicles, small delivery type trucks and large combination-type trucks. Figure 2 in **Appendix C** shows the number of vehicles in each category by time of day for the average weekday. It shows that most (about 91 percent) of the traffic using Stratford Road NE are passenger vehicles, about 6 percent are small trucks, and 3 percent are large trucks. As shown, the peak hour for truck activity occurred at 4:00 PM when 15 large trucks and 44 small trucks used Stratford Road NE.

Historic Traffic Growth

WSDOT performs periodic traffic counts along various segments of SR 17. The two most recent sets of counts were performed in 2011 and 2014. **Table 3.10-1** summarizes the seasonally-adjusted average daily traffic (ADT) volumes at four locations along SR 17. As shown in **Table 3.10-1**, traffic growth along SR 17 ranged from -0.35 percent to 2.17 percent per year. As described later in this analysis, a compound growth rate of 2 percent per year was applied to estimate the future traffic volumes for the No Action Alternative.

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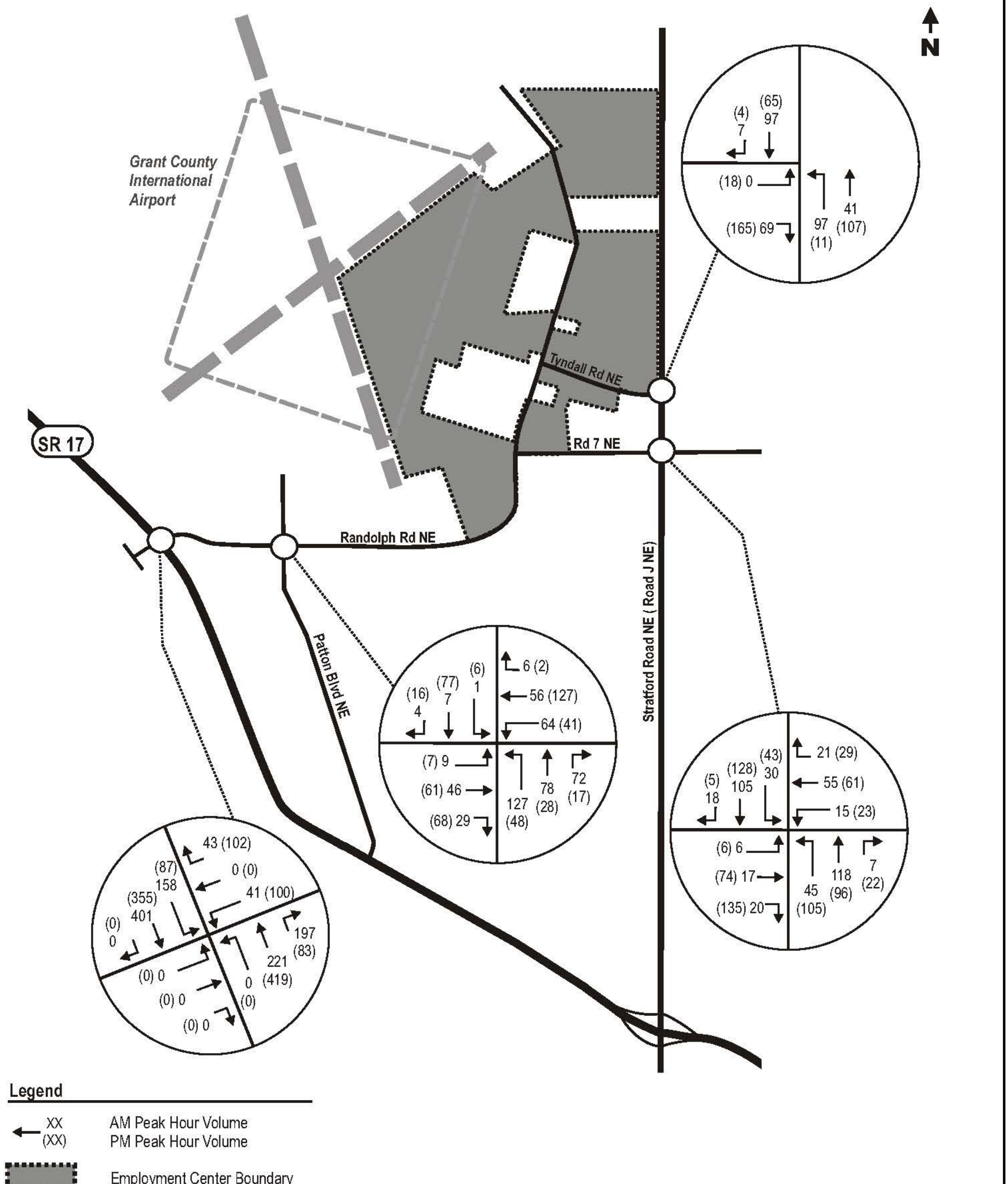

Source: Heffron Transportation, 2015.

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Figure 3.10-2
Existing (2015) Traffic Volumes—AM and PM Peak Hours

Table 3.10-1
HISTORIC TRAFFIC GROWTH ON SR 17

	Location on State Route 17			
	After Junction with Patton Blvd Connection	After Junction with Airway Drive NE	Before Junction with McConihe Road NE	After Junction with McConihe Road NE
2014 ADT*	10,000	9,500	9,600	8,100
2011 ADT	9,900	9,600	9,000	7,700
Annual Compound Growth Rate	0.34 percent	-0.35 percent	2.17 percent	1.70 percent

Source: WSDOT Traffic Counts, 2011 and 2014.

*ADT = Average Daily Traffic

Traffic Speeds

A vehicle speed study was also conducted along Stratford Road NE just south of Road 7 NE at the same time the traffic counts were conducted. The posted speed limit along this section of Stratford Road NE is 55 mph. Figure 3 in **Appendix C** shows the travel speeds by direction. The 85th percentile speed during the count duration was 59.3 mph in the northbound direction and 58.4 mph in the southbound direction, which are 6 to 8 percent higher than the posted speed limit.

Level of Service

Level of service (LOS) analysis was performed for the study intersections during both the AM and PM peak hours. LOS is a qualitative measure used to characterize traffic operating conditions. Six letter designations, "A" through "F," are used to define level of service. LOS A is the best and represents good traffic operations with little or no delay to motorists. LOS F is the worst and indicates poor traffic operations with long delays. Grant County has adopted a standard of LOS D for its roadways within urban areas and urban non-interstate highways.[4] WSDOT has established a standard of LOS D for Highways of Statewide Significance in urban areas of Grant County[5], which includes SR 17.

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[4] Grant County, *Comprehensive Plan*, 2006.

[5] Washington State Department of Transportation, *Level of Service Standards for Washington State Highways*, January 1, 2010.

LOS for the study intersections were analyzed using methodologies presented in the *Highway Capacity Manual*[6]. All level of service calculations were performed with Trafficware's *Synchro 8.0* analysis software.

Level of service for intersections is defined in terms of average delay per vehicle. For a signalized intersection, level of service is based upon average delay for all vehicles traveling through the intersection. The level of service for a one-way or two-way stop-controlled intersection is determined by the average delay for each minor (stop-controlled) movement, which is related to the availability of gaps in the main street's traffic flow, and the ability of a driver to enter or pass through those gaps. **Table 3.10-2** shows the level of service criteria for signalized and unsignalized intersections, as defined in the *Highway Capacity Manual*. Stop-controlled intersections have different level of service threshold values than signalized intersections, primarily because drivers expect different levels of performance from different types of transportation facilities. In general, stop-controlled intersections are expected to carry lower volumes of traffic than signalized intersections. Therefore, for the same LOS, a smaller amount of delay is acceptable at stop-controlled intersections than for signalized intersections.

Table 3.10-2
LEVEL OF SERVICE CRITERIA

Level of Service	Average Delay Per Vehicle		General Description
	Signalized	Unsignalized	
A	≤ 10.0 seconds	≤ 10.0 seconds	Free flow
B	10.1 – 20.0 seconds	10.1 – 15.0 seconds	Stable flow
C	20.1 – 35.0 seconds	15.1 – 25.0 seconds	Stable flow
D	35.1 – 55.0 seconds	25.1 – 35.0 seconds	Approaching unstable flow
E	55.1 – 80.0 seconds	35.1 – 50.0 seconds	Unstable flow
F	> 80.0 seconds	> 50.0 seconds	Forced flow (jammed)

Source: Transportation Research Board, 2010.

Existing traffic volumes, peak hour factors, geometric conditions and travel speeds were used for the level of service analysis. For the intersections on Stratford Road NE and SR 17, the main street speed was set to 60 mph based on the field-measured travel speeds. Pedestrian crossings at the Patton Road NE/Randolph Road NE intersection (adjacent to

[6] Transportation Research Board, *Highway Capacity Manual*, Special Report 209, 2010.

Endeavor Middle School) were also included. **Table 3.10-3** summarizes the existing levels of service. The analysis indicates that the westbound left turns at the Randolph Road NE/SR 17 intersection currently operate at LOS E during both the AM and PM peak hours. The westbound left turn at the Randolph Road NE/Patton Boulevard NE intersection currently operates at LOS E during the AM peak hour but at LOS C during the PM peak hour. All other study intersections are currently operating at LOS D or better under existing conditions.

Table 3.10-3
LEVEL OF SERVICE SUMMARY – EXISTING (2015) CONDITIONS

Intersection	AM Peak Hour		PM Peak Hour	
	LOS [1]	Delay [2]	LOS	Delay
Randolph Rd NE / SR 17				
Westbound Left Turns	E	48.8	E	43.6
Southbound Left Turns	A	8.4	A	8.6
Randolph Rd NE / Patton Blvd NE				
Eastbound Left Turns	C	24.6	C	16.3
Westbound Left Turns	E	36.9	C	15.1
Northbound Left Turns	A	8.0	A	7.8
Southbound Left Turns	A	7.8	A	7.4
Tyndall Road NE / Stratford Rd NE				
Eastbound Movements	A	9.7	B	11.9
Northbound Left Turns	A	7.8	A	7.5
Rd 7 NE / Stratford Rd NE				
Eastbound Movements	B	14.3	D	34.9
Westbound Movements	C	17.4	F	91.2
Northbound Left Turns	A	7.9	A	8.0
Southbound Left Turns	A	7.7	A	7.7

Source: Heffron Transportation, Inc., 2015.

1. Level of service.
2. Average seconds of delay per vehicle.

Traffic Safety

Collision data were obtained from WSDOT for the four-year period from January 1, 2011, through December 31, 2014. This information was reviewed to determine if there are any adverse traffic safety conditions that could affect or be affected by the proposed project.

The collision data are summarized in Table 1 in **Appendix C** for the intersections and roadway segments in the study area. As shown in Table 1 in **Appendix C**, the highest number of collisions occurred at the intersection of Stratford Road NE/Road 7 NE. Six of the 14 collisions were right angle. At the Randolph Road NE/Patton Boulevard NE intersection, all 10 of the collisions were right angle. As indicated in the WSDOT report, these collisions were either the result of drivers disregarding the stop sign or not granting right-of-way to the other vehicle.

On SR 17 approximately 1/3 mile north of Randolph Road NE, outside of the study area, a collision resulted in a fatality. The WSDOT collision report indicated that in May 2012, a vehicle traveling northbound on SR 17 hit a pedestrian.

Transit

Transit service in the study area is provided by the Grant Transit Authority. There is no direct transit service to the GCIA, although several routes serve the Big Bend Community College immediately south of the airport. The routes that currently serve the study area[7] are listed below:

- Route 50: Big Bend – Cascade Valley – Aquatic Center
- Route 54: Moses Lake – Soap Lake – Ephrata – Quincy (Weekend service only)
- Route 56: Moses Lake – Warden
- Route 58: Ephrata – Royal City – Moses Lake
- Route 59: Moses Lake – Ephrata – Soap Lake – Grand Coulee
- Route 62: Ephrata – Moses Lake (Big Bend Community College)
- Route 65: Big Bend Community College – Ephrata – Soap Lake

Within the study area, there is a Park & Ride lot on Randolph Road NE immediately east of SR 17. This lot is divided with 11 parking spaces on both the north and south sides of Randolph Road NE. This location is served by Routes 54, 56, 58, 62 and 69. There is also a transit stop with a shelter on the Big Bend Community College Campus along 28th Avenue NE. This location is served by Routes 50, 59, 62 and 65. Bus stops are located along Patton Boulevard NE south of Randolph Road NE. Routes 50 and 56 serve these stops.

[7] Grant Transit Authority website, March 2015.

A new transit center is planned in Moses Lake at the intersection of Division Street/5th Avenue and should be completed by Spring 2016. The transit center will serve as a multimodal hub for Grant Transit and other bus lines, and will include customer amenities such as an enclosed waiting area, information center, bicycle storage lockers, taxi pick-up/drop-off area and electric vehicle (EV) charger stations.

Non-Motorized Transportation Facilities

As described in the previous Section 3.10.1, **Affected Environment**, several roadways in the study area have sidewalks on one or both sides. However, there are also several roadways that do not have sidewalks or have incomplete sidewalks. Field observation and traffic counts indicated that the majority of pedestrian activity in the study area occurred near Endeavor Middle School at the corner of Randolph Road NE and Patton Boulevard NE. At this location there are sidewalks on three corners of the intersection; on the southeast corner there is curb with gravel. The intersection has crosswalks on the north and west legs. The highest pedestrian activity occurred during a half-hour period from 2:45 to 3:15 PM. At that time 99 pedestrians crossed the north leg, 94 crossed the west leg and 4 crossed the east leg of the intersection. During the AM peak hour for traffic (which occurred from 7:15 to 8:15 AM), a total of 55 pedestrians crossed the intersection. During the PM peak hour (4:00 to 5:00 PM), there were fewer than 10 pedestrian crossings. There was no pedestrian activity observed during the peak periods at the other three study intersections. At the Road 7 NE/Stratford Road NE intersection there were a total of six bicyclists during the AM peak hour and two bicyclists during the PM peak hour.

3.10.2 Impacts of the Alternatives

This section analyzes the potential transportation impacts in the study area with proposed development by comparing conditions against the No Action Alternative. It determines the magnitude of trips that could be generated, and how those trips could affect the local roadway network and site access roads. For the purpose of this analysis, it is assumed that full build-out of Alternatives 1 and 2 would occur by the year 2035 – a 20-year horizon. However, since actual development could occur faster or slower than assumed, depending on market conditions, various mitigation measures were determined for various trigger levels, which could then be related to the size of development.

Alternatives 1 and 2

Trip Generation

Alternatives 1 and 2 assume potential full build-out of the almost 1,260-acre site under existing zoning. The total amount of building space could range from about 8.8 million to 10.1 million gross square feet, and employ up to 19,000 people. A range of aerospace and manufacturing uses are assumed under the development alternatives, with each alternative featuring different employment densities and operations (Alternative 1 would emphasize heavy manufacturing and warehousing uses, while Alternative 2 would emphasize light manufacturing and technology uses; see **Chapter 2** for detailed descriptions of the alternatives). The land uses envisioned would generate the following types of trips:

- **Commute trips by employees** – Most commute trips would occur during the morning and afternoon peak periods, but some businesses that operate with multiple employment shifts could generate trips that occur during off-peak times or in the reverse direction of the primary shift's trips;
- **Supplies and deliveries** – Manufacturing businesses would require raw material or component inputs, and warehouses would receive goods. Many of these types of materials are delivered by trucks;
- **Deliveries** – Finished products would be delivered to customers or other manufacturing locations; and
- **Ancillary** – Some additional trips by visitors, customers, food services and others would occur.

It is also expected that some trips could occur between or among various businesses that choose to locate near the GCIA. For example, some businesses may manufacture components that are used by another nearby manufacturing plant. Therefore, trip rates (per employee or per square foot) are likely to decrease as development grows in the area.

For the purpose of this transportation analysis, trip generation data from the *Trip Generation Manual*[8] were used. **Table 3.10-4** summarizes the trip generation rates for a variety of land use types that could potentially occur with Alternatives 1 and 2. Although there could be a range of uses, trip equations for *Manufacturing* (Land Use Code 140) were applied to both alternatives based on the estimated number of employees, because it reasonably represents the level of trips generated by a mix of the potential industrial uses. These equations result in estimated total trips that would exceed trips generated by heavy industrial or warehousing uses. They reflect values assuming up to 40 percent of the estimated employment would commute during the peak hour period. This is reasonable given that many businesses could operate with multiple shifts and not all employees would exit the area during a single hour. ITE's *Trip Generation* provides no guidance related to truck trip generation. Therefore, results from a study of a corporate park with warehousing functions in the City of DuPont, Washington were used.[9] This study determined that on a daily basis, 10 percent of all trips were generated by trucks (large, medium and small) and that trucks represented 2 percent of the peak hour traffic. **Table 3.10-5** shows the daily, AM peak hour and PM peak hour vehicle trips generated by Alternatives 1 and 2.

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[8] Institute of Transportation Engineers (ITE), 9th Edition, 2010.

[9] Heffron Transportation, Inc., *Transportation Impact Analysis for the DuPont Corporate Park*, November 13, 2012.

Table 3.10-4
COMPARISON OF AVERAGE TRIP GENERATION RATES FOR INDUSTRIAL USES

Land Use Category (ITE Land Use Code)	Average Trip Generation Rates per Employee		
	Daily	AM Peak	PM Peak
General Light Industrial (LU #110)	3.02	0.44	0.42
General Heavy Industrial (LU#120) [1]	0.82	0.40	0.40
Manufacturing (LU #140) [2]	2.13	0.40	0.40
Warehouse (LU #150)	3.89	0.51	0.59
High Cube Warehouse/Distribution Ctr (LU #152)	3.77	0.24	0.27

Source: Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition, 2010.

1. Peak hour rates reflect peak hour of the generator.
2. Manufacturing rates used for analysis.

Table 3.10-5
TRIP GENERATION – ALTERNATIVES 1 AND 2

Land Use	Daily	AM Peak Hour Trips			PM Peak Hour Trips		
	Trips	In	Out	Total	In	Out	Total
Alternative 1 - Heavy Manufacturing / Warehouse Emphasis							
Pass Vehicle Trips	25,920	3,870	1,430	5,300	2,100	2,670	4,770
Truck Trips	2,880	80	30	110	40	60	100
Total Trips	28,800	3,950	1,460	5,410	2,140	2,730	4,870
Alternative 2 - Light Manufacturing / Technology Emphasis							
Pass Vehicle Trips	36,450	5,440	2,010	7,450	2,950	3,750	6,700
Truck Trips	4,050	110	40	150	60	80	140
Total Trips	40,500	5,550	2,050	7,600	3,010	3,830	6,840

Source: Heffron Transportation, Inc., 2015.

Trips determined using rates for manufacturing use in the *Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition*, 2010.

Trip Distribution Pattern

Most of the trips generated by the Alternatives 1 and 2 would be related to employee commute trips. The origins and destinations for these trips were estimated using information about where people currently live within about a 45-minute commute to the site—an area that extends west to Quincy, north to Soap Lake and south to Othello. Data related to the population in "occupied residences" from the U.S. Census (2010) were used.

These data were then weighted to account for the fact that employees are most likely to live closer to the site.[10] The resulting trip distribution pattern is shown on **Figure 3.10-3.** As shown in **Figure 3.10-3**, about one-third of the trips are expected to use roadways that link to areas north of the site, and about two-thirds are expected to travel to and from areas south of the site. Since most of the developable area is located closest to Stratford Road, it is expected that this road would be the primary travel route for trips arriving from the south. The exception is for trips to the residential developments located off of Patton Boulevard NE near SR 17. These trips were assumed to use Randolph Road NE and Patton Boulevard NE to reach these areas. It is recognized that Harris Road NE and Loring Drive could be an alternative route for these trips. While growth in population is likely to occur in the future, it would not substantially change the primary travel routes or patterns to the site.

Three access connections between the site and Stratford Road are proposed: Road 7 NE, Tyndall Road NE and a new potential North Access Road that would be constructed to link the north end of the *GCIA Employment Center*. Of these, it is expected that Tyndall Road NE would be the major access point, and was assumed to be used by 45 percent of the traffic arriving and departing on Stratford Road. The new potential North Access Road is assumed to serve 30 percent of that traffic while Road 7 NE would serve 25 percent.

Trips generated by full build-out of each alternative were assigned to the roadway network according to this pattern, and those trips are shown on **Figure 3.10-4** and **Figure 3.10-5** for Alternative 1 and Alternative 2, respectively.

Roadway Capacity Needs

The number of trips generated by full build-out of either development alternative would likely require substantial improvements along Stratford Road NE, with some improvements also needed along SR 17. The road configuration needed to accommodate the potential traffic volumes was first evaluated using high-level planning analysis related to the capacity of various roadway configurations.

[10] Residents within a 20-minute travel time to the site were weighted at 100 percent; residents that live within 21 to 30 minutes of the site were weighted at 75 percent; and residents with travel time greater than 30 minutes were weighted at 50 percent.

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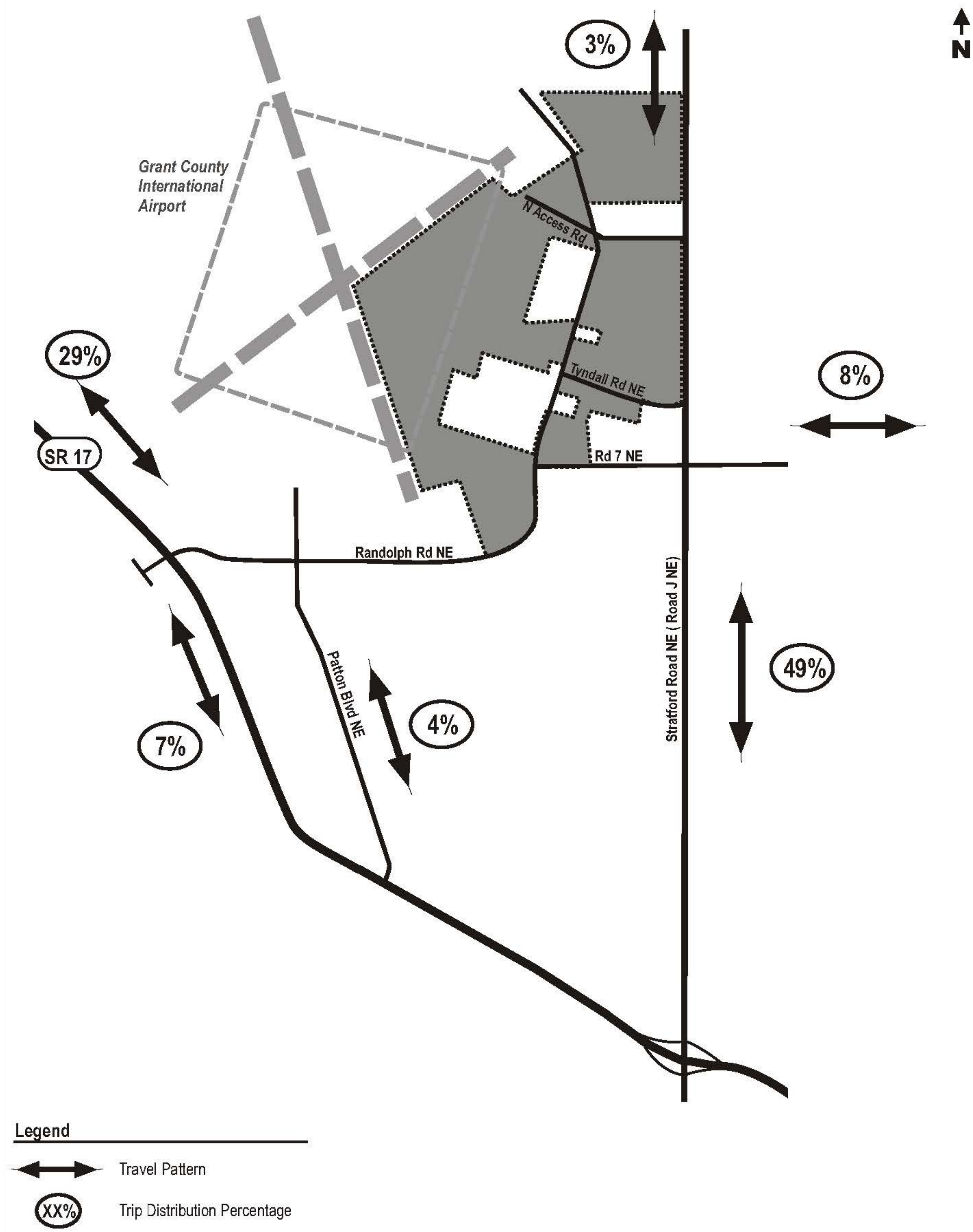

Source: Heffron Transportation, 2015.

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Figure 3.10-3

Trip Distribution Pattern

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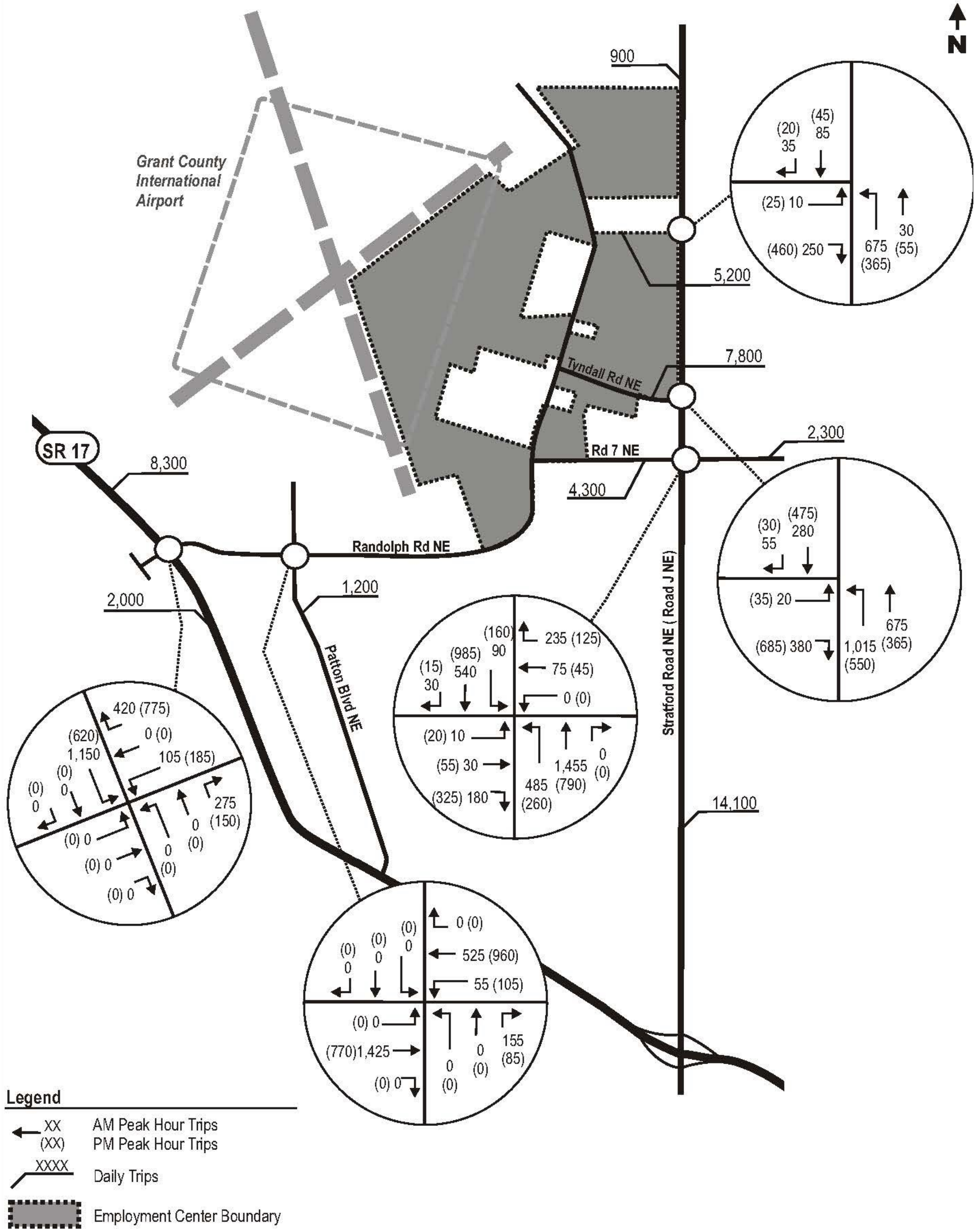

Source: Heffron Transportation, 2015.

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Figure 3.10-4

Project Trips—Alternative 1

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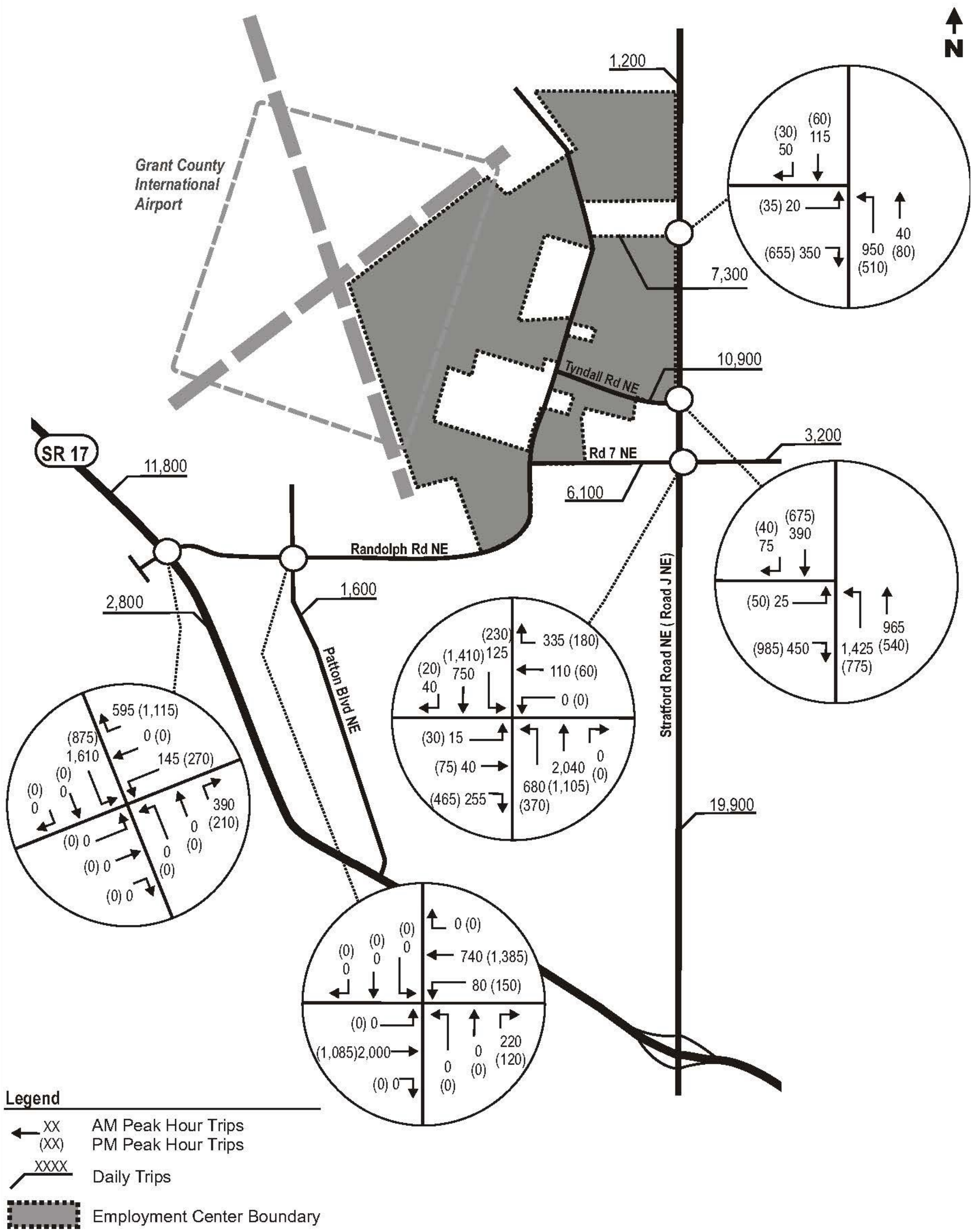

Source: Heffron Transportation, 2015.

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Figure 3.10-5

Project Trips—Alternative 2

The number of lanes on a roadway is the key determinate of the roadway's capacity, although it is not the only determinate. Most congestion along a highway or arterial typically occurs at signalized or stop-controlled intersections. The number of lanes needed at a traffic signal or roundabout relates to the number of lanes needed along a corridor. For example, severe tapering would be required to provide an intersection with five lanes along a two-lane highway. The number of left-turning vehicles that access driveways between signals is another key determinate of a corridor's capacity. If there is no center turn lane, left-turning vehicles can block through-traffic on the highway while waiting for a sufficient gap to make the turn. Higher traffic volumes on a corridor increase the frequency and duration of each blockage.

Table 3.10-6 lists approximate capacity values derived for various lane configurations, based on several national sources. For this analysis, the ADT threshold for a LOS D condition was used to assess each roadway's needs.

Table 3.10-6
CAPACITIES OF VARIOUS LANE CONFIGURATIONS

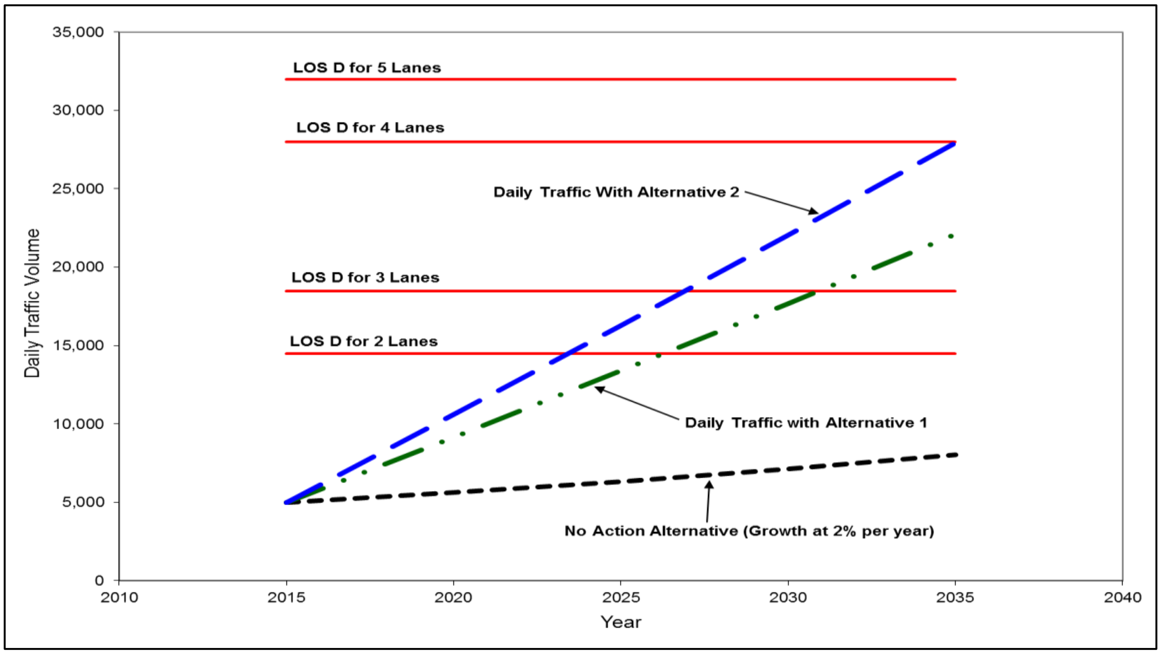
Roadway Geometry	Approximate ADT Capacity Ranges	Assumed ADT for LOS D
2 Lanes	16,000 to 18,000 ADT	14,500 ADT
3 Lanes	18,000 to 23,000 ADT	18,500 ADT
4 Lanes	24,000 to 35,000 ADT	28,000 ADT
5 Lanes	32,000 to 40,000 ADT	32,000 ADT

Sources: National Cooperative Highway Research Program (NCHRP) Report 187: Quick Response Urban Travel Estimation Techniques and Transferable Parameters (Transportation Research Board, 1978); TRB Circular 212: Interim Materials on Highway Capacity (1980).

Note: LOS D condition assumed to be 80percent of the top capacity range.

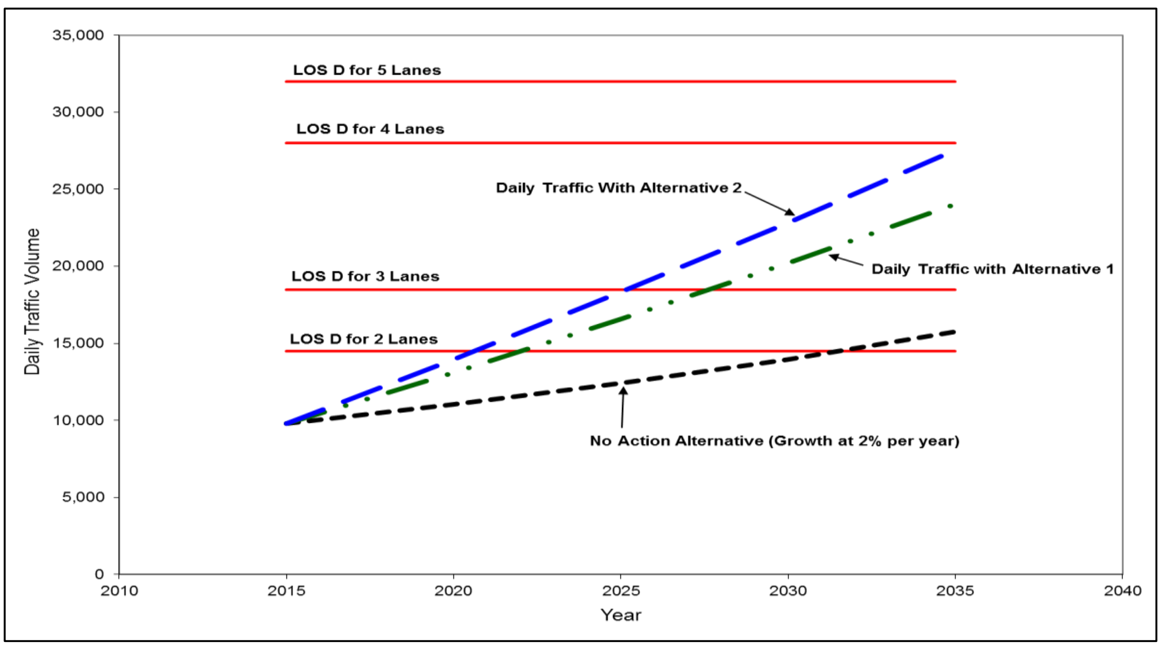
The capacity thresholds described above were used to assess future needs for both Stratford Road NE and SR 17, which would accommodate the highest volumes of project-generated traffic. Existing daily traffic volumes on both facilities were used to establish the year 2015 conditions, and these were assumed to grow at 2 percent per year for the No Action Alternative, based upon the historical traffic growth in the area described previously. Project-generated traffic was then added to each roadway assuming even growth over the 20-year planning horizon. For example, by 2025 (halfway through the 20-year planning horizon), an estimated 50 percent of the development was assumed to be in place. **Figure 3.10-6** shows the volume-capacity analysis for Stratford Road, and **Figure 3.10-7** shows the analysis for SR 17 north of Randolph Road NE, which would be the primary travel route for employees who reside in locations such as Ephrata, Soap Lake and Quincy.

Figure 3.10-6
VOLUME VERSUS CAPACITY ON STRATFORD ROAD NE



Source: Heffron Transportation, Inc., 2015.

Figure 3.10-7
VOLUME VERSUS CAPACITY ON SR 17 NORTH OF RANDOLPH ROAD NE



Source: Heffron Transportation, Inc., 2015.

The high-level analysis shows that the existing two-lane configuration on Stratford Road NE would likely have sufficient capacity to accommodate about 40 percent of the potential development under Alternative 2 (the development alternative that would generate the highest traffic volumes). Spot improvements to add left-turn lanes at key cross streets would add capacity to accommodate up to about 65 percent of Alternative 2. Beyond that, a four-lane cross section would be needed. The segment of Stratford Road NE in Moses Lake is already a five-lane configuration, which would likely accommodate the additional traffic generated by both Alternatives 1 and 2.

SR 17 is primarily a two-lane highway, but has left-turn lanes at major cross-streets (e.g., Road 10 NE and McConihe Road NE) and has several passing lane segments between Randolph Road NE and SR 282. This configuration would be sufficient to accommodate about 50 percent of the Alternative 2 development. Beyond that, additional spot improvements could be needed to increase capacity of SR 17 north Randolph Road NE.

Traffic volumes on the three access roads between Stratford Road NE and the GCIA—Road 7 NE, Tyndall Road NE and the new potential North Access Road—could be accommodated with two-lane roads (one lane in each direction). Some additional capacity could be needed at key intersections, as described below.

Intersection Control Needs

The build-out traffic volumes and recommended roadway cross sections described above were used to determine appropriate intersection control for key intersections. WSDOT prefers roundabouts for intersections along the state highway instead of traffic signals due to safety benefits and reduced maintenance requirements. This traffic control device is also likely the best option for key intersections along Stratford Road NE given the volume of traffic that may need to turn left from northbound Stratford Road NE toward the airport.

The intersection of Randolph Road NE/Patton Boulevard NE is adjacent to the middle school, and Grant County has recently applied for a grant to make school safety enhancements at this location. A traffic signal, rather than a roundabout, may be desired at this location to provide for active control of pedestrian crossings. That option was evaluated. Various traffic control measures for minor intersections along Randolph Road NE and Road 7 NE were tested to determine appropriate traffic control. Analysis of stop-controlled and signalized intersections was performed using the *Highway Capacity Manual* methodology and Synchro 8.0 traffic operations software. Analysis of roundabout intersections was performed using the Sidra analysis software, which is typically preferred by WSDOT.

Table 3.10-7 summarizes the intersection control that would be needed at various levels of development. These are set at 25 percent, 50 percent, 75 percent and 100 percent of the employment projected for Alternative 2. The recommended traffic control was defined by the configuration that would be needed to attain LOS E or better operations during both the AM and PM peak hours. Although it exceeds the adopted level of service standard (LOS D),

Table 3.10-7
INTERSECTION NEEDS AT VARIOUS LEVELS OF DEVELOPMENT

Intersection	Recommended Configuration and Traffic Control[1]			
	~ 4,750 employees	~ 9,500 employees	~ 14,250 employees	~ 19,000 employees
Stratford Road NE / Road 7 NE	Install roundabout with one lane on all approaches	Same as previous with two lanes on Stratford Road NE approaches	Same as previous with two lanes on all approaches	Interchange that vertically separates northbound left turns from through traffic
Stratford Road NE / Tyndall Road NE	Retain existing stop sign control but add separate right-turn pocket on eastbound Tyndall Road NE approach	Install roundabout with two lanes on northbound and eastbound approaches and one lane on southbound approach	Same as previous but add 2nd lane on southbound approach	Same as previous
Stratford Road NE / North Access Road (New)	Build new North Access Road. Control eastbound approach with stop sign	Install roundabout with one lane on all approaches	Same as previous	Same as previous with two northbound lanes through roundabout
SR 17 / Randolph Rd NE	Install roundabout with two lanes on SR 17 approaches and one lane on Randolph Road approaches	Same as previous with two lanes on Randolph Road NE approaches	Same as previous with right-turn bypass lanes on northbound and westbound approaches	Interchange that vertically separates southbound left turns from through traffic
Randolph Rd NE / Patton Blvd NE	Install traffic signal. No other changes needed.	Same as previous	Same as previous but convert one of the northbound lanes to right-turn only lane with island	Same as previous with one additional lane eastbound on Randolph Road

Source: Heffron Transportation, Inc., 2015.

[1]Configuration needed to achieve a LOS E or better conditions during both the AM and PM peak hours.

this threshold was selected since it represents a condition that is near the capacity of the intersection, and provides a basis for determining when improvements would be needed.

Potential North Access Road

A sensitivity analysis was performed to determine how much traffic could be accommodated by Road 7 NE and Tyndall Road NE before the new potential North Access Road is needed. This assumes the other improvements listed in **Table 3.10-7** for the 9,500 employee conditions. Those improvements include roundabouts at the Stratford Road NE/Road 7 NE and Stratford Road NE/Tyndall Road NE intersections with some roadway widening approaching and through the roundabouts. Those configurations would operate at LOS E for that threshold of employment, suggesting that the potential North Access Road could be deferred until then. Beyond that threshold, additional improvements would be needed to disperse traffic among the three access points.

Interchange at SR17/Stratford Road

Capacity improvements would likely be needed at the existing interchange of SR 17/Stratford Road NE. However, the specific improvements would be highly dependent upon where employees of the project live. The potential employment levels under Alternatives 1 and 2, which could range up to 19,000 people, could dramatically affect residential land use patterns in the central core area of Moses Lake, adding density to existing neighborhoods. If that occurs, capacity improvements along Stratford Road NE could be needed. If residential growth is spread over a larger area, then more trips to the site could use the SR 17 ramps. In addition, increased density in the city center would increase opportunities to serve employee trips with transit, reducing the need for some roadway capacity improvements. It is likely that WSDOT would require that transit strategies and/or demand management measures targeting employee commute trips be implemented to the extent feasible, before interchange capacity improvements would be considered. Determining the potential residential land use implications and future transit service are beyond the scope of this EIS. Therefore, it is recommended that Grant County partner with the City of Moses Lake and WSDOT to perform detailed analysis of the SR 17/Stratford Road NE interchange in consideration of the future land use and transit paradigms. Extensive improvements would not likely be needed until employment at the site exceeds 5,000.

Traffic Safety

Statistically, the number of collisions at study area intersections is likely to increase as traffic volumes increase as a result of the project. Traffic control measures that can help reduce the potential for collisions have been recommended. Roundabouts are recommended as the primary traffic control measure at the site access intersections on Stratford Road NE and SR 17. Roundabouts typically have fewer vehicle collisions than signalized intersections because they eliminate crossing and left turn movements, and also help slow traffic along a corridor. A traffic signal is recommended at the intersection of Randolph Road NE/Patton Boulevard NE in order to provide active control of the existing pedestrian crossings adjacent to the middle school. The proposed project is not expected to have a significant adverse impact on traffic safety.

Transit

The majority of commuter trips generated by the project are expected to use personal vehicles. However, a new employment center with substantial employment could increase the demand for transit. If only 5 percent of the employees were to use transit, the upper levels of employment could generate about 150 peak direction transit trips per hour. As density increases, targeted route improvements could be made. The Grant Transit Authority should consider extending some of the existing routes that now serve Big Bend Community College to one or two transit stops within the site area.

Non-Motorized Facilities

This remote employment site would generate few, if any, commute trips by walk or bike modes of travel. However, some internal walking trips could occur between businesses and transit stops or to ancillary uses such as food services. Pedestrian facilities should be constructed on at least one side of new streets developed for the project. The optimal location for new crosswalks at intersections would be assessed during the design of those improvements.

Freight

Several roundabouts have been recommended at key access intersections along Stratford Road NE and SR 17. All new roundabouts should be constructed to accommodate large semi-tractor trailer vehicles, and have wheel-mountable aprons on the inside islands. The new potential North Access Road and other internal connections should also be designed to accommodate the turning movements of large trucks.

Alternative 3

Under Alternative 3, the No Action Alternative, it is assumed that no new development or infrastructure improvements would occur on the *GCIA Employment Center* site at this time. The site would remain in its partially developed condition, and there would be no new transportation-related impacts related to the project. The transportation impact analysis was conducted using the No Action Alternative as the baseline for future 2035 build-out conditions. Based on historic traffic growth patterns, a compound growth rate of 2 percent per year was applied to estimate the future background traffic volumes for the No Action Alternative. As shown in **Figure 3.10-6**, under the No Action Alternative through the 2035 build-out, Stratford Road NE would have the capacity to accommodate the traffic volumes. As shown in **Figure 3.10-7**, under the No Action Alternative through approximately 2032, SR 17 north of Randolph Road NE would accommodate the traffic volumes. Beyond that point, additional capacity would be required on SR 17 north of Randolph Road NE.

3.10.3 Mitigation Measures

The needed roadway configuration and intersection control would change with increased employment at the site, regardless of whether that employment is related to development under Alternative 1 or 2. The following required/proposed mitigation measures address the potential transportation-related impacts that could result from development under Alternatives 1 or 2.

Required/Proposed Mitigation Measures

Pre-Development Activities

- Prior to development, an implementation and funding plan for the phased transportation mitigation package would be prepared.
- Grant County would consider partnering with the City of Moses Lake and WSDOT to perform detailed study of the SR 17/Stratford Road NE interchange.

Transportation Improvements

- Intersections would be improved per the threshold guidance listed in **Table 3.10-7**. The potential North Access Road could be deferred until development reaches approximately 9,500 employees.
- Stratford Road NE and SR 17 would be widened, as needed, between and adjacent to improved intersections to increase capacity (see guidance in **Figure 3.10-6** and **Figure 3.10-7**).
- Truck movements would be provided for at all new roundabouts and intersections.
- The Port, City and County would work with Grant Transit Authority to extend existing routes from Big Bend Community College to the site, or to establish new routes when demand warrants.
- Pedestrian facilities would be constructed on at least one side of new roads developed for the project. The optimal location for new crosswalks at intersections would be assessed during the design of those improvements.

3.10.4 Significant Unavoidable Adverse Impacts

The *GCIA Employment Center* project would generate traffic and increase congestion at many intersections in the site vicinity. Potential mitigation consistent with known planning has been identified for all intersections shown to be deficient under future conditions with the project in place. No significant unavoidable transportation-related impacts are anticipated with implementation of the mitigation measures listed above.

3.11 PUBLIC SERVICES

This section of the DEIS describes public services (police service and fire and emergency medical service) that are provided to the *GCIA Employment Center* site. Potential impacts from development of the EIS alternatives are evaluated and mitigation measures identified. Police service is provided by the Grant County Sheriff's Office and the Moses Lake Police Department. Fire service is provided by Grant County Fire District #5 and the Moses Lake Fire Department. This section is based on personal communication with the service purveyors.

3.11.1 Affected Environment

Grant County Sheriff's Office

The Grant County Sheriff's Office (GCSO) provides police services to portions of the *GCIA Employment Center* site that are located within unincorporated Grant County. GCSO headquarters are located in the City of Ephrata, approximately 14 miles to the northwest of the project site. The *GCIA Employment Center* site is located within GCSO's East Patrol Area and a sub-station is located approximately one mile to the southwest of the site (on Arnold Drive). This sub-station is not manned for any specific hours and is primarily used by those deputies that are assigned to the East patrol area during their shifts (GCSO, 2015).

GCSO currently employs 50 commissioned (full-time deputies), 38 limited commission (full-time corrections deputies) and 15 limited-commission (reserve patrol deputies). GCSO maintains a mandatory minimum of four patrol deputies on duty for any given shift. Each shift is 12 hours long and typical shifts range from 6:00 AM to 6:00 PM and 6:00 PM to 6:00 AM. GCSO is an accredited agency with the Washington State Association of Sheriffs and Police Chiefs and must maintain strict adherence to over 150 standards and requirements (including staffing and utilization of personnel, health and safety, performance evaluation, patrol functions, training, etc.) to maintain their accreditation (GCSO, 2015). In addition, the Grant County Comprehensive Plan identifies a level of service (LOS) standard of 0.55 law enforcement deputies per 1,000 unincorporated population.

GCSO provides service to an approximately 2,700-square mile area and currently provides a staffing ratio of approximately one patrol deputy for every 3,821 citizens (less than the 0.55 deputies per 1,000 population LOS standard in the Comprehensive Plan). Historically, calls for service from GCSO have remained at relatively consistent levels. In 2014, GCSO responded to approximately 15,487 calls for service, which represented an approximately 3.6 percent decrease in calls from the previous year (16,064 calls for service in 2013) (GCSO, 2015).

City of Moses Lake Police Department

The City of Moses Lake Police Department (MLPD) provides police service to the portions of the *GCIA Employment Center* site that are located within the city limits of the City of Moses Lake. MLPD headquarters are located approximately four miles to the south of the project site at 411 S Balsam Street in the City of Moses Lake.

MLPD currently employs 29 full-time police officers and are in the process of hiring 3 additional officers due to recent personnel losses. MLPD maintains a mandatory minimum of three officers on duty for each shift. Typically, there are three shifts during a 24-hour period and each shift is nine hours long (i.e., 5:30 AM to 2:30 PM, 2:00 PM to 11:00 PM and 9:00 PM to 6:00 AM). MLPD adheres to a staffing LOS guideline of 1.5 officers per 1,000 population (MLPD, 2015).

Historically, calls for service to MLPD have remained at relatively consistent levels (between 16,000 and 17,000 calls for service annually). In 2014, MLPD received approximately 16,700 calls for service, which represented an approximately 3.5 percent increase in calls for service from 2013. Of these calls for service, very few calls were generated by the *GCIA Employment Center* site, relative to other areas of MLPD's jurisdiction (MLPD, 2015).

Grant County Fire District #5

Grant County Fire District #5 (GCFD #5) provides fire response service and emergency medical service (through a contract with American Medical Response [AMR]) to the portions of the *GCIA Employment Center* site that are located within unincorporated Grant County. GCFD #5 consists of 12 stations located throughout Grant County. The two stations that are closest to the *GCIA Employment Center* site are Station 8 (located at 1021 Arlington Drive – approximately one mile to the southwest of the site) and Station 9 (located at 7335 Road M NE – approximately 3.4 miles to the east of the site). In addition, AMR maintains an emergency medical service station/dispatch location at 6828 22nd Avenue NE, approximately 0.5 mile to the west of the site (GCFD #5, 2015).

GCFD #5 staffing is primarily based on volunteers. Nine full-time staff members are assigned to the GCFD #5 headquarters (Station 1) and include the Fire Chief, Battalion Chiefs, Captains, Firefighter/Mechanic, Firefighter/Fabricator, Firefighter secretary and three paid firefighter positions. Approximately 97 volunteer firefighters comprise the remainder of the GCFD #5 staff. Volunteers are assigned to specific stations throughout the GCFD #5 service area and respond via pagers when they are available.

Station 8, the closest GCFD #5 station to the *GCIA Employment Center* site, is staffed by 10 volunteer firefighters, six of which are resident firefighters[1]. Apparatus at Station 8 includes two structure engines, a quick response aid vehicle, two wildland engines, a 3,000 gallon

[1] Resident firefighters live at the station and are required to be on-duty from 7 PM to 7 AM. Residents work a rotation shift of 48 hours on and 96 hours off across three shifts (GCFD #5, 2015).

tender truck, a 110-foot ladder truck and a box van with salvage equipment (GCFD #5, 2015).

Station 9 is staffed by five volunteer firefighters, none of which are resident firefighters. As described above, volunteer firefighters respond to calls via pager when they are available. Apparatus at Station 9 includes a structure engine, a wildland engine, a wildland engine with 2,500 gallons of water capability and a 3,000 gallon tender truck (GCFD #5, 2015).

In addition, GCFD #5 contracts with AMR to provide emergency medical response service to its area of responsibility. AMR employs nine career paramedics to serve the GCFD #5 area. The closest station/dispatch location to the project site is located approximately 0.5 mile to the west of the site (6828 22nd Avenue NE). Typically, three paramedics are on-duty each day; however, staffing levels can be flexible depending on call volumes (AMR, 2015).

GCFD #5 maintains a goal to dispatch personnel within one minute for an emergency medical service call and within two minutes for a fire service call. GCFD #5 does not maintain a response time goal due to the rural nature of the area and the distances that are required to travel for calls. However, in 2014, the average response time for the first responding engine to arrive at the scene was approximately 10.33 minutes and over the last four years, average response time has ranged from 10.33 minutes to 10.93 minutes (GCFD #5, 2015).

Calls for service from GCFD #5 have remained relatively consistent over the past five years and the majority of calls (approximately 60 percent) have been for emergency medical service. **Table 3.11-1** summarizes the calls for services from GCFD #5 over the last five years.

Table 3.11-1
GRANT COUNTY FIRE DISTRICT #5 CALLS FOR SERVICE – 2010 to 2015

	2010	2011	2012	2013	2014
Fire	145	171	161	181	163
Overpressure, Rupture, Explosion – No Fire	3	4	2	3	1
Rescue/Emergency Medical Service	1209	646	620	621	647
Hazardous Condition – No Fire	30	29	27	38	18
Service Call	29	18	16	12	4
Good Intent Call	116	159	179	180	195
False Alarm	51	41	43	45	45
Special Incident Type	3	3	6	4	6
Total Calls	**1,586**	**1,071**	**1,054**	**1,084**	**1,079**

Source: Grant County Fire District #5, 2015.

From a planning perspective, GCFD #5 typically adds approximately 10 or more new volunteer firefighters to its staffing roster each year. GCFD #5 also purchases used fire trucks to be refurbished in their facilities and uses them to replace older, outdated trucks. In addition, GCFD #5 has begun the process of replacing/remodeling current fire stations.

Station 2 and Station 10 are at the top of the list for replacement/remodel; however, the schedule for those projects is not known at this time (GCFD #5, 2015).

Moses Lake Fire Department

Moses Lake Fire Department (MLFD) provides fire and emergency medical service to the portions of the *GCIA Employment Center* site that are located within the City of Moses Lake. MLFD maintains two fire stations within the City of Moses Lake: Station 1 is the closest to the project site and is located at 701 E 3rd Ave (approximately four miles to the southeast of the site), while Station 2 is located at 2401 W Broadway (approximately six miles to the south of the site). MLFD is a career firefighter department and is not staffed by any volunteers. Current staffing for MLFD includes three Chief Officers, one Fire Inspector, 14 Firefighter/Paramedics, 12 Firefighter/EMT-B[2], one Paramedic and one EMT-B (MLFD, 2015).

Station 1 provides minimum staffing of six firefighter personnel (three assigned to an engine and two assigned to a medic unit); command, administrative and fire prevention personnel are also assigned to Station 1. During weekdays between 8:00 AM and 4:00 PM, a single role emergency medical service (EMS) unit operates from Station 1 and is staffed by a paramedic and an EMT. Apparatus at Station 1 include two pumper truck engines, a 75-foot quint, four ambulances, a rescue unit, a squad unit, two brush trucks, a rescue boat, a 2,000 gallon tender truck, three command units, a special response trailer and an oil spill response trailer (MLFD, 2015).

Station 2 includes minimum staffing of two firefighter personnel that are cross-staffed between the engine truck and medic unit. Apparatus at Station 2 include a pumper truck engine, an ambulance, and a brush truck (MLFD, 2015).

As a career firefighter department, MLFD is required to establish response time standards for fire response and EMS response. The turnout time standard for MLFD is 60 seconds with a 90 percent response time standard. The first engine fire response time is five minutes with a 90 percent response time standard. EMS response time is also five minutes with a 90 percent response time standard; the EMS-Advanced Life Support (ALS) response time is 10 minutes with a 90 percent response time standard. In 2014, MLFD did not meet the response time standard for first engine response or EMS response (56.6 percent and 88 percent, respectively); however, MLFD did meet the standard for turnout time (93 percent) and EMS-ALS response time (94 percent). Distance to existing fire department facilities has been the primary reason for not meeting the standard, as recent annexations to the City of Moses Lake have expanded MLFD's service area. MLFD is currently in the process of updating their response time standards to include the following:

- Turnout time standard – 75 seconds, 90 percent of the time;

[2] EMT-B is the entry level for emergency medical technicians. Procedures and skills are generally non-invasive (bleeding control, CPR, splinting, etc.).

- First response fire engine – five minutes, 90 percent of the time;
- First full alarm response – 10 minutes, 90 percent of the time;
- First EMS response – five minutes, 90 percent of the time; and
- First EMS-ALS response – seven minutes, 90 percent of the time.

These updated response time standards are currently under review by the Moses Lake City Council (MLFD, 2015).

Over the past five years, MLFD has responded to 18,498 calls for service, which averages approximately 3,700 calls for service per year. The majority of the calls for service (approximately 88 percent) were for EMS response. **Table 3.11-2** summarizes the calls for service from MLFD over the last five years.

Table 3.11-2
MOSES LAKE FIRE DEPARTMENT CALLS FOR SERVICE – 2010 to 2015

Types of Calls	2010 - 2015
Fire	422
Emergency Medical Service (EMS)	16,204
Rescue	418
Hazardous Condition – No Fire	219
Service Call	185
Good Intent Call	378
False Alarm	654
Severe Weather	16
Other Call	5
Total Calls	**18,498**

Source: Moses Lake Fire Department, 2015.

MLFD is also in the process of developing a five-year and 10-year plan for the department, including facility needs, staffing and equipment. The draft plan identifies the need to increase staffing at Station 2 to a minimum of three on-duty personnel; develop a third station in the north portion of the City with a minimum of three on-duty personnel; increase command staff by a minimum of one personnel; and add new equipment including a new engine and a 100-foot aerial platform (MLFD, 2015).

3.11.2 Impacts of the Alternatives

This section analyzes impacts on public service providers (police service and fire and emergency medical service) to the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are so noted.

Alternative 1 and Alternative 2

Police Services

Construction

During infrastructure and building construction of the proposed *GCIA Employment Center* under Alternatives 1 and 2 (which would occur over an assumed 20-year build-out period), there could be a temporary increase in calls for police services by GCSO and MLPD. Construction-related police service calls would be typical of industrial, warehouse and technology development and could include calls related to trespassing, theft of construction materials, vandalism and construction-related noise complaints. Potential increases in call volumes over the duration of the construction process would be anticipated to fall within the response capacity of GCSO and MLPD. In addition, project elements such as on-site security and construction traffic control measures would be incorporated into development of the project site to minimize potential impacts on GCSO and MLPD.

Operation

It is anticipated that operation of the *GCIA Employment Center* under Alternatives 1 and 2 would result in an increased demand for police services from GCSO and MLPD. The number of *GCIA Employment Center* employees and vehicular trips (including truck trips) generated by the project would affect the demand for police service (e.g., more vehicular trips could potentially generate more accidents and traffic violation stops). Under Alternative 2, there would be a larger number of employees (approximately 19,010 employees) and more vehicular trips (approximately 40,500 daily trips) at full build-out than under Alternative 1 (approximately 15,019 employees and 28,800 daily trips). Therefore, it is anticipated that Alternative 2 could potentially generate a greater demand for police services than Alternative 1. Increased demand for police services would also result from the anticipated increase in criminal activity (e.g., theft, trespassing and vandalism) that could be associated with operation of the *GCIA Employment Center* under Alternatives 1 and 2.

Based on input from GCSO and MLPD, it is anticipated that there would be a need to increase full-time officer staff capacity in order to accommodate the increased demand for police services that would be generated by new development under Alternatives 1 and 2. The transportation analysis for this DEIS (see Section 3.10, **Transportation**, and **Appendix C** for details) indicates that statistically, the number of collisions in the site vicinity is likely to increase due to increased traffic volumes from the project. However, implementation of mitigation measures (roundabouts at site access intersections and a potential traffic signal at the Randolph Road NE/Patton Boulevard NE intersection) would help to reduce the potential for traffic collisions and the *GCIA Employment Center* would not be anticipated to result in significant adverse impacts to traffic safety. Therefore, while increases in calls for police service due to traffic incidents would be anticipated, these increases are not anticipated to be significant.

Future increases in employment and population over the next 20 years in the GCSO and MLPD service areas, including employment from the *GCIA Employment Center*, would be incremental and would be accompanied by increases in demand for police services. A portion of the tax revenues generated from future development in the area, including the *GCIA Employment Center* site, would help to offset the increased demands for police services. Increased demand for police services from future development would also be addressed by Grant County and City of Moses Lake capital facilities planning processes and the planning processes of GCSO and MLPD to ensure that no significant adverse impacts to police services would occur.

Fire and Emergency Services

Construction

Construction-related impacts on fire protection and emergency medical services provided by GCFD #5 and MLFD would potentially increase, including calls for service related to injury and fire incidences during the 20-year build-out period for the *GCIA Employment Center* site. Construction worker safety procedures would be implemented during the construction process on the site to reduce the potential for injuries during the build-out period. Potential increases in call volumes over the duration of the construction process would be anticipated to fall within the response capacity of GCFD #5 and MLFD.

Additional construction-related impacts to GCFD #5 and MLFD would occur as the *GCIA Employment Center* site is developed under Alternatives 1 and 2, and could include demands for fire prevention staff to review building plans submittals for new development and conduct on-site construction inspections during the construction process. Building plan reviews and building inspections by GCFD #5 and MLFD would be required on a regular basis during the 20-year build-out period in order to reduce the potential for injury and fire safety and maintain public safety.

Operation

Development under Alternatives 1 and 2 would generate additional calls for fire and emergency medical service during operation of the *GCIA Employment Center*. Calls for service would be generated by new industrial, warehouse, technology and airport uses. Such calls could include: work-related fires and injuries, and emergency aid calls. Similar to existing conditions for GCFD #5 and MLFD, the majority of calls are anticipated to be for emergency medical service.

Based on input from GCFD #5 and MLFD, it is anticipated that there would be a need to increase firefighter and EMT/paramedic staff capacity; provide additional equipment and apparatus; and potentially update and construct new fire station facilities in order to accommodate the increased demand for fire and emergency medical services that would be generated by new development under Alternatives 1 and 2. It is expected that Alternative 2 would result in a greater demand for fire and emergency services than Alternative 1 due to the larger number of employees on the site (approximately 19,010 employees compared to approximately 13,519 employees, respectively).

In addition, it is possible that certain industrial, warehouse, technology and airport uses could result in the need for handling, temporary storage and/or transport of hazardous materials as part of operations on the *GCIA Employment Center* site. Depending on the specific nature of the materials, the handling, storage and transport of hazardous materials would be regulated by applicable local and state standards to ensure public safety and protect the environment. Calls for service from the GCFD #5 and MLFD hazardous materials teams could result; however, such calls are not expected to cause significant impacts to GCFD #5 and MLFD.

Future increases in employment and population over the next 20 years in the GCFD #5 and MLFD service areas, including employment at the *GCIA Employment Center*, would be incremental and would be accompanied by increases in demand for fire and emergency medical services. A portion of the tax revenues generated from future development in the area, including from the *GCIA Employment Center* development, would help to offset the increased demands for fire and emergency medical services. Increased demand for fire and emergency medical services from future development would also be addressed by Grant County and the City of Moses Lake capital facilities planning processes and the planning processes of GCFD #5 and MLFD to ensure that no significant adverse impacts to fire and emergency medical services would occur.

Alternative 3

Under Alternative 3, the No Action Alternative, no new development would occur on the *GCIA Employment Center* site at this time. The site would remain in its partially developed condition, and there would be no new temporary or permanent impacts on public services.

3.11.3 Mitigation Measures

The following required/proposed mitigation measures address the potential impacts on public services (police service and fire and emergency medical service) that could result from the construction and long-term use of Alternatives 1 or 2.

Required/Proposed Mitigation Measures

Police Services

- On-site security would be provided during construction to reduce the potential for construction-related incidents. Such measures could include fencing and securing areas where construction equipment is stored onsite.
- Traffic control measures would be provided for construction vehicles and equipment during the construction process and traffic mitigation measures would be provided

to minimize the operational traffic impacts of the *GCIA Employment Center* (see Section 3.10, **Transportation**, and **Appendix C** for details).

Fire and Emergency Services

- Construction worker safety measures would be implemented during development on the site, in accordance with applicable Occupational Safety and Health Administration (OSHA) standards.
- All new buildings on the *GCIA Employment Center* site would be constructed in compliance with applicable International Building Code and International Fire Code requirements and standards, as adopted by Grant County and the City of Moses Lake.

Other mitigation measures that would be implemented to address impacts on public services include:

- A portion of the tax revenues generated from future development of the *GCIA Employment Center* site would help to offset the increased demands for police and fire services.
- Increased demand for police and fire services from future development would also be addressed by Grant County and City of Moses Lake capital facilities planning processes and the planning processes of GCSO, MLPD, GCFD #5 and MLFD.

3.11.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts on public services (police service and fire and emergency medical service) are anticipated with implementation of the mitigation measures listed above.

3.12 UTILITIES

This section of the DEIS describes existing utility services (i.e., water, sewer, electricity, natural gas and communications) currently provided to the *GCIA Employment Center* site and vicinity. In addition, utility demands are estimated, potential impacts from development of the DEIS alternatives are evaluated and mitigation measures identified. This section was prepared by Reid Middleton (see **Appendix D** for additional information, maps, and references).

3.12.1 Affected Environment

The *GCIA Employment Center* site currently contains water, sewer, natural gas, electricity and telecommunication lines, some of which were developed to serve the former air base and the remainder were developed in ensuing years to serve industrial and airport-related land uses.

Water

Water service is currently provided to the *GCIA Employment Center* site by the City of Moses Lake and lies within the Larson service zone. Since the early 1940s, groundwater has been the source for the municipal water supply; and a series of wells, storage facilities and distribution systems configured in six pressure zones supply water to the City. The City is working with the Washington State Department of Ecology (Ecology) to recognize valid water claims. When this work is complete, the total water rights and claims will be in excess of 25,000 acre-feet per year. Currently, the City uses around 9,500 acre-feet per year. Therefore, according to the City, water rights are not anticipated to be a limiting factor in serving the *GCIA Employment Center*.

The current capacity in the Larson zone, assuming the largest well is out of service, is approximately 4,500 gallons per minute (gpm) or 6.48 million gallons per day (mgd). Current maximum daily demand is around 2,700 gpm (3.89 mgd). Therefore, there is currently 1,800 gpm (2.59 mgd) of additional capacity for the entire Larson zone. This capacity is on a first come first served basis and would not be reserved for any future use. Additional wells can be drilled as needed to increase the capacity in the zone; however, there are currently no plans for drilling additional wells to supply the Larson zone.

The *GCIA Employment Center* site is currently served by water mains extending from the airport terminal area (southwest of the site) and consists of a 10-inch diameter water main and a 12-inch diameter water main, the latter of which runs beneath Randolph Road (see **Appendix D**). The 12-inch main continues north along Randolph Road, reduces to 10 inches in diameter at Tyndall Road and then reduces again to eight inches in diameter just south of the SGL plant before continuing north out of the *GCIA Employment Center* site. The Randolph Road main branches westward at Tyndall Road and extends to serve the developed western portion of the site lying adjacent to Taxiway “G”. The water mains in this developed area vary in size from 6 to 12 inches depending on their location in the network relative to demand source and eventually loop back to the terminal area via the aforementioned 10-inch main.

Plans for future water main extensions involve the construction of a looped network of 8-, 10- and 12-inch diameter water mains configured to provide reliable pressures and redundant service to the site (see **Appendix D**).

Sanitary Sewer

Two sanitary sewer systems currently serve the site: the Larson Treatment Plant (owned and operated by the City of Moses Lake) and the Port of Moses Lake Industrial Wastewater Treatment Facility (owned and operated by the Port of Moses Lake).

Larson Treatment Plant

The site is served by a network of gravity sewer mains and sewer force mains that direct domestic flows and some industrial flows to the Larson Treatment Plant located just beyond the south boundary of the site (see **Appendix D**). The plant is owned and operated by the City of Moses Lake. The Larson Treatment Plant serves an area corresponding to the old Larson Air Force Base in the northern portion of the Moses Lake Urban Growth Area (UGA). Because of the level terrain of large portions of the Larson system service area, pump stations are necessary to transport flows to the Larson Treatment Plant. The Larson collection system has five pumping stations, two of which are located within the *GCIA Employment Center* site. The Larson Plant, which was reconstructed in 1973, was designed for a capacity of 0.6 mgd. The plant was upgraded in 2003 to 0.75 mgd capacity. Current flows are typically below 350,000 (0.35 mgd) gallons per day.

Port Industrial Wastewater Treatment Facility

The Port of Moses Lake operates an industrial wastewater treatment system to serve industries near the airport and industrial park. The wastewater facility was originally constructed in 2000 and consists of a gravity collection system, pressure transmission line, a 58-million-gallon storage lagoon, a freshwater well and 124 acres of irrigated cropland. The facility treats the non-contact wastewater flows (i.e., water used for cooling and other functions that do not result in direct contact with industrial contaminants) from the major industries at the Port by spraying the effluent on croplands during growing periods when crops must be irrigated. During those periods when crop irrigation cannot occur (approximately 150 days per year), the system is designed to store wastewater. Storage capacity is one of the critical factors in determining how much non-contact industrial wastewater can be accommodated by the system. Current capacity of the system is 58 million gallons. Effluent flow volume to the system in 2014 was approximately 57.99 million gallons or roughly 157,000 gallons per day. At this rate, approximately 23.55 million gallons of winter storage is required, which is well within the current storage capacity of the system.

In 2014, the Port of Moses Lake purchased additional acreage to accommodate additional crops for its land application program. The Port is in the process of finalizing design of Phase 1 pivot which would provide a total of 248 acres for irrigation and supply the necessary capacity for short-term, non-contact wastewater flow increases. When completed, the system expansion is anticipated to provide a system capacity of 272 million gallons per year. **Table 3.12-1** provides a summary of projected flows and loading for the Port of Moses Lake wastewater facility based on current requested subscriptions by industrial users.

Table 3.12-1
SUBSCRIPTION LEVEL INDUSTRIAL FLOWS AND LOADS

	Wastewater Flows	
Industry	**Average GPD**	**MG/Year**
Chemi-Con	80,000	29.20
ML Industries	50,000	18.25
USFS-ATB	1,800	0.66
SGL	135,000	49.28
Genie	6,000	2.19
AstaReal	69,000	25.19
Total	**341,800**	**124.76**
System Capacity (248 acres)		**272.01**
Percent of Capacity		**46%**

Source: Reid Middleton, 2015.

Electricity

Grant County Public Utility District (GCPUD) provides electrical power to the site and vicinity that is reputed to be extremely reliable and cost effective. These system characteristics have made Grant County attractive for industries that have large power consumption processes.

GCPUD provides both 230 kilovolt (KV) and 115 KV service to the *GCIA Employment Center* site. Major transmission lines run along both sides of Stratford Road along the east boundary of the site. These lines lead to a transmission switching and operations yard at the northeast corner of the intersection of Stratford Road with Road 7 NE (southeast of the site). GCPUD has two substations within the site; one at the northeast corner of the intersection of Tyndall Road with Randolph Road and one along the east boundary of the Genie Industries parcel south of Graham Road and west of Randolph Road (see **Appendix D**).

With construction of the SGL plant near the northeast corner of the GCIA Employment Center site, the Tyndall portion of the GCPUD power distribution system that serves the site and surrounding area is at capacity. Industrial development with an electrical demand of less than 5 megawatts (MW) can usually be accommodated through temporary measures, while smaller improvements to the system are built to provide permanent service. New development that would require electrical demands greater than 5 MW would require additional improvements by GCPUD, including the potential development of an additional substation.

Natural Gas

Natural gas is supplied to the *GCIA Employment Center* site by Cascade Natural Gas Corporation (see **Appendix D**). A six-inch diameter coated steel main is located in the Road 7 NE right-of-way and extends into the site from east of Stratford Road. The six-inch main turns north at Randolph Road and continues north along Randolph Road to where the south property line of Parcel 171016000 (near the central portion of the site) intersects the Randolph Road right-of-way. From that point north along Randolph Road, a four-inch diameter coated steel main has been extended northward to the southwest corner of the SGL plant property (near the northwest corner of the site) and forms the northerly terminus of the system in the *GCIA Employment Center* site. At the point where the six-inch main transitions to a four-inch main, the six-inch main then turns northwesterly along the south property line of Parcel 171016000 (near the central portion of the site) and extends to roughly the southwest corner of this parcel.

A 4-inch diameter plastic main has been extended into Parcel 171006000 (near the central portion of the site) and eventually reduces to a 2-inch diameter plastic service line to serve Parcel 171017000 (in the southeast portion of the site). The only other service to the area is a 2-inch diameter coated steel main that extends into Parcel 090629205 (near the central portion of the site).

Communications

The Moses Lake area is served by a number of communication providers for telephone and internet services. Century Link provides telephone service to the *GCIA Employment Center* vicinity via traditional copper-conductor transmission lines.

3.12.2 Impacts of the Alternatives

This section analyzes impacts on utilities (water, sewer, electricity, natural gas and communications) that serve the *GCIA Employment Center* site with proposed development. Impacts are expected to be similar for Alternatives 1 and 2; where impacts would differ, they are so noted.

Alternatives 1 and 2

Water

Assumed development under Alternatives 1 and 2 would generate increased demand for water for industrial and other operations (for purposes of this analysis, water demand volumes are considered to be the same as sewage generation volumes). **Table 3.12-2** illustrates the estimated water demand under Alternatives 1 and 2, and shows the remaining capacity of the overall city water system once water rights for valid claims are processed.

Table 3.12-2
WATER DEMAND AND CAPACITY (OVERALL CITY WATER SYSTEM) – ALTERNATIVES 1 AND 2

Land Use	Water Demand (MGD)	MGD with all rights	System Capacity (MGD) **
Alternative 1	4.94	22.30	8.8
Alternative 2	2.96	22.30	10.86
Alt. 1, Phase 1	1.08	22.30	12.74
Alt. 2, Phase 2	0.53	22.30	13.29

Source: Reid Middleton, 2015.

* Assumes 50 weeks per year at 5 days per week

** Total system capacity minus current and projected flows

As shown in **Table 3.12-2**, with approved water rights as currently being sought by the City of Moses Lake, the City's water system has ample capacity to serve full build-out of the *GCIA Employment Center* under Alternatives 1 and 2.

Figure 3.12-1 illustrates the water demand under Alternatives 1 and 2 in relation to the City of Moses Lake water system capacity, as well as under both Alternatives with a two percent background growth rate, and indicates that the overall City system has capacity to accommodate full buildout development under Alternatives 1 and 2.

Figure 3.12-1
WATER DEMAND AND THE CITY OF MOSES LAKE SYSTEM CAPACITY - ALTERNATIVES 1 AND 2

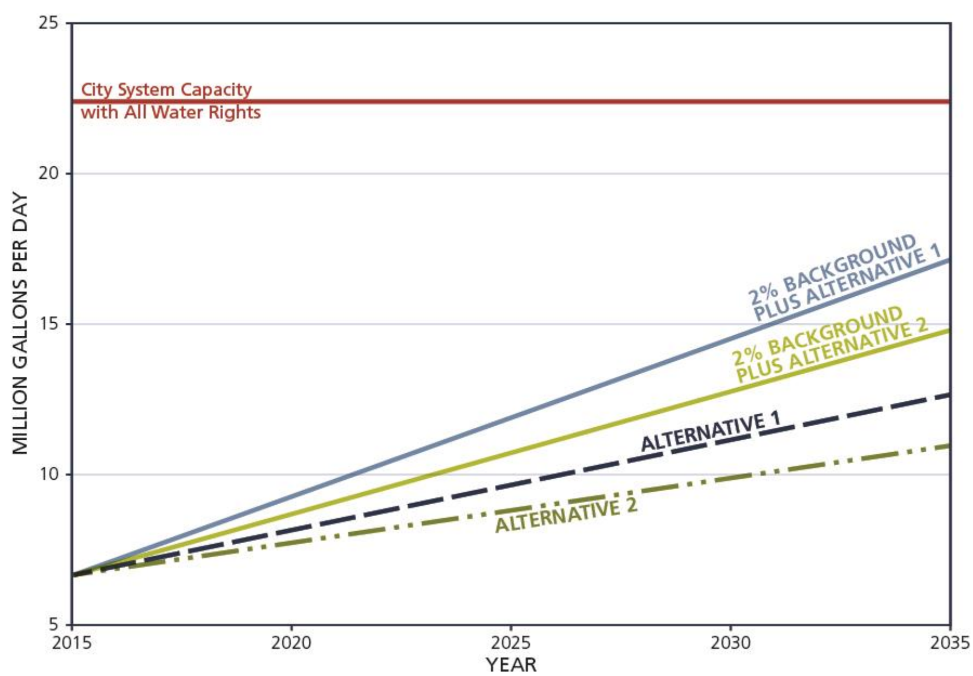


Table 3.12-3 uses the same demand volumes as **Table 3.12-2** and shows the remaining capacity of the Larson zone of the City's water system.

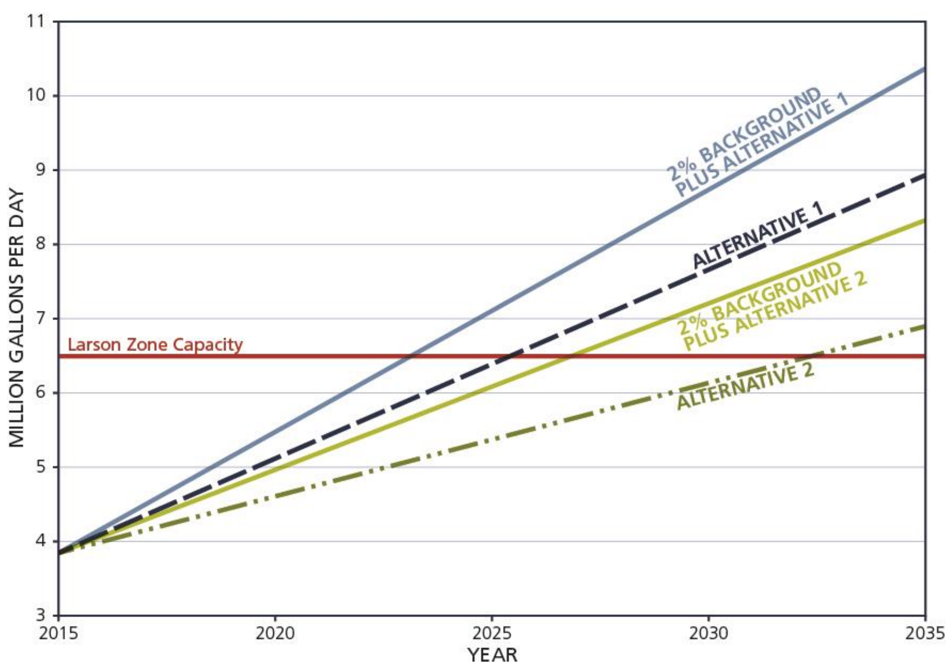
Table 3.12-3
WATER DEMAND AND CAPACITY, LARSON ZONE – ALTERNATIVES 1 AND 2

Land Use	Existing Demand (MGD)	Plus 2% Background Growth (MGD)	Proposed Water Demand (MGD)*	Larson zone available capacity (MGD)	Remaining zone capacity (MGD) **
Alternative 1	3.89	5.45	4.94	6.48	(3.91)
Alternative 2	3.89	5.45	2.96	6.48	(1.93)
Alt. 1, Phase 1	3.89	4.28	1.08	6.48	1.12
Alt. 2, Phase 2	3.89	4.28	0.53	6.48	1.67

Source: Reid Middleton, 2015.
* Assumes 50 weeks per year at 5 days per week
** Total system capacity minus current and projected flows

Table 3.12-3 shows that without drilling additional wells, full build-out of Alternatives 1 and 2 would exceed the capacity of the current Larson zone. **Figure 3.12-2** illustrates the water demand under Alternatives 1 and 2 compared to the capacity of the Larson zone of the City of Moses Lake water system; both Alternatives with an assumed two percent background growth rate are shown.

Figure 3.12-2
WATER DEMAND AND THE CITY OF MOSES LAKE LARSON ZONE – ALTERNATIVES 1 & 2



As indicated in **Figure 3.12-2**, the Larson zone has sufficient capacity to accommodate a level of site development between Phase 1 and Phase 2 under Alternative 1 (approximately 3 million square feet) and a level of site development between Phase 2 and Phase 3 under Alternative 2 (approximately 5 million square feet), including a two percent background growth assumption.

Under Alternatives 1 and 2, water mains would be extended into the property as development demand warrants in general compliance with the City of Moses Lake Water System Comprehensive Plan, as adapted to actual development conditions.

Sanitary Sewer

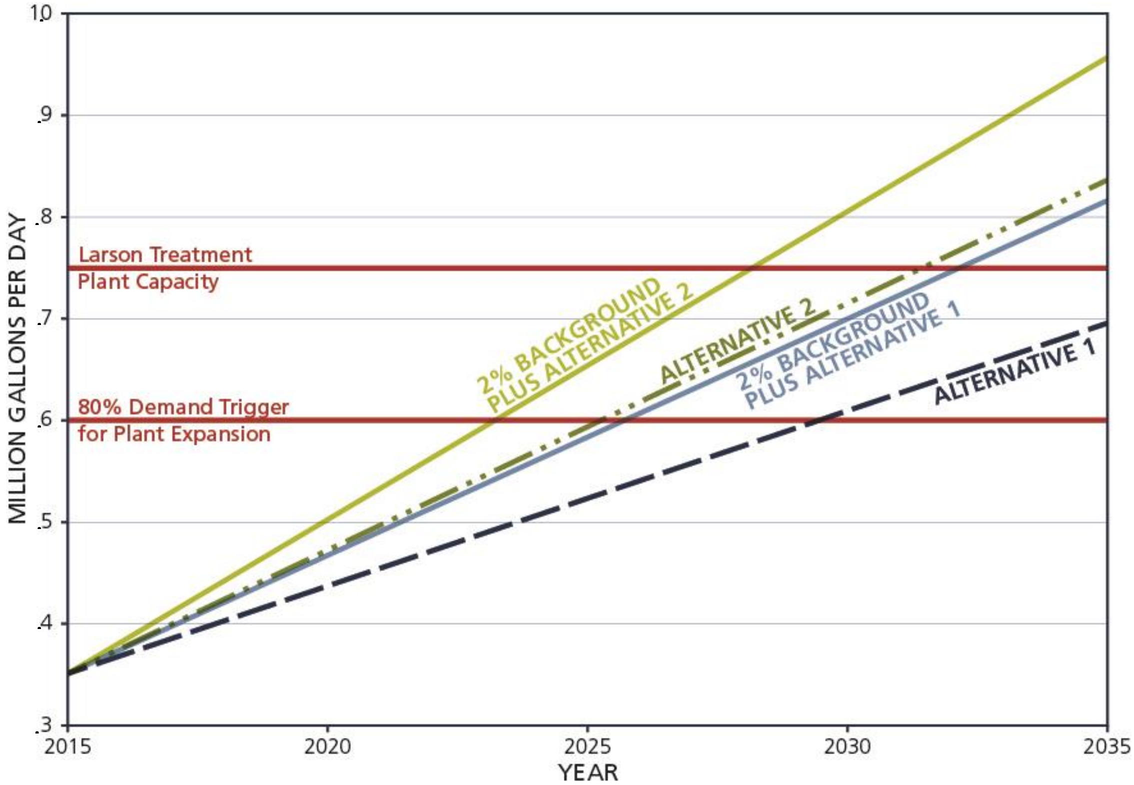
At full build-out, the *GCIA Employment Center* is projected to generate up to 4.94 mgd of combined industrial discharge and domestic sewage from both assumed heavy industrial and warehouse uses under Alternative 1. This is based on 5,000 gallons per gross acre per day. The domestic waste component of the sewage stream is projected to be 0.34 mgd (based on 25 gpd per employee), leaving roughly 4.6 mgd to be directed to the Port's industrial wastewater facility (assuming waste other than domestic sewage would be non-contact industrial waste compatible with the Port's treatment system).

For Alternative 2, it is assumed that an industrial waste stream would be generated by light industrial and technology uses, but at a lesser rate than under Alternative 1. The overall sewage generation rate assumed under Alternative 2 is 3,000 gallons per gross acre per day, which would result in a total sewage generation rate of 2.96 mgd. The larger number of employees associated with Alternative 2 would generate 0.48 mgd, leaving approximately 2.48 mgd of non-contact industrial waste to be diverted to the Port's system (assuming waste other than domestic sewage would be industrial waste compatible with the Port's treatment system).

Domestic Waste

Figure 3.12-3 illustrates the demand for sewage treatment generated under Alternatives 1 and 2, both as a standalone demand and as added to an assumed two percent background growth rate. A comparison to the Larson Treatment Plant overall capacity and the 80 percent demand that will trigger planning for improvements is also provided.

Figure 3.12-3
SEWAGE TREATMENT DEMAND – ALTERNATIVES 1 AND 2



As shown in **Figure 3.12-3**, the Larson Treatment Plant has a capacity to treat 0.75 mgd of sewage, of which 0.35 mgd is presently being utilized. Full build-out under Alternative 1, assuming the generation rates noted above, would result in a 0.69 mgd total discharge to the plant, which is 0.09 mgd above the 80 percent threshold that would trigger planning for a plant expansion. This would leave 0.06 mgd reserve capacity under Alternative 1 to serve the remainder of the service area. Under Alternative 2, expansion of the plant to add another 0.08 mgd of capacity would be required to serve assumed full build-out. Thus, full build-out under Alternative 1 limits the ability of the Larson Treatment Plant to service growth in the balance of the Larson Treatment Plant service area, while full build-out under Alternative 2 would require a plant expansion.

However, a level of assumed site development between Phase 2 and Phase 3 under Alternative 1 (approximately 5 million square feet), and an assumed site development between Phase 1 and Phase 2 under Alternative 2 (approximately 3.5 million square feet) , including a two percent background growth factor, could be accommodated by the Larson Plant without triggering a plant expansion.

The City of Moses Lake intends to monitor the capacity of the Larson Treatment Plant by screening development applications to determine anticipated sewage generation rates for the proposed development. The City determined that development producing less than 150 gpm peak flow and 100,000 gpd to be discharged to the Larson Treatment Plant would not have an adverse effect on the sewer system. However, the Washington State Department of Ecology requires that system capacity be upgraded when it reaches 80 percent of its current capacity. Monitoring land use applications would allow the City to begin planning for expansion of the facility at an appropriate time while having capacity to serve additional users during the planning and design of the expansion.

Industrial Waste

With regard to industrial waste, the Port industrial waste system has a current storage capacity of 58 million gallons, with current plans to expand the system to eventually handle up to approximately 272 million gallons annually or 745,000 gpd. Winter storage to accommodate this flow will require 111.75 million gallons of storage. Given the industrial waste volumes projected, the existing capacity would provide for roughly 6 days of collection for Alternative 1 and 11 days of collection for Alternative 2 during periods when land application of the effluent cannot occur. The planned expansion would increase those days of collection to 24 days for Alternative 1 and 45 days for Alternative 2 at full build-out. Phase 1 of Alternative 1 would generate demand for 97 days of storage, with the expanded system being able to fully store demand for Phase 1 of Alternative 2.

Electricity

The Grant County PUD was consulted regarding approximate electrical power consumption rates for the various land uses proposed under Alternatives 1 and 2. The PUD recommended a rate of 4.5 watts per square foot for warehousing, 6.7 watts per square foot for aviation-related development, 8.7 watts per square foot for both heavy and light industrial uses and 5.4 watts per square foot for technology/laboratory space.

Based on these consumption rates, Alternative 1 is anticipated to generate demand for 67.7 megawatts of electrical power at full build-out, with Alternative 2 requiring 72.9 megawatts. Phase 1 development would demand 15.7 megawatts of power for Alternative 1 and 16.1 megawatts of power for Alternative 2.

As indicated earlier in this section, with construction of the SGL plant near the northeast corner of the site, the Tyndall portion of the GCPUD power distribution system that serves the site and surrounding area is presently at capacity. GCPUD can accommodate incremental new development with power demand loads that total less than five megawatts, sometimes through the use of an interim service option until a permanent solution is provided. Should the system require upgrading before service can be provided, new customers in the area, including new customers on the site under Alternatives 1 and 2, could experience some delay in the provision of service (GCPUD indicated six to nine months for upgrades to the distribution system and delays in service depending on the level of system upgrades that would be required).

GCPUD has indicated that a new substation would have the capacity to serve an approximately 78 megawatt electrical load, which is large enough to accommodate build-out under Alternatives 1 and 2.

Natural Gas

Projected natural gas demand at full build-out of the *GCIA Employment Center* is shown in **Table 3.12-4**

Table 3.12-4
NATURAL GAS DEMAND – ALTERNATIVES 1 AND 2

	Annual Demand (MBTU)	Peak Gas Demand (CFH)	Peak Gas Demand (CFM)
Alternative 1	35,890	110,913	1,849
Alternative 2	41,087	118,704	1,978

Source: Reid Middleton, 2015.

Cascade Natural Gas Corporation has indicated that the existing natural gas system serving the site and surrounding area has ample capacity to serve the loads projected for full build-out of Alternatives 1 and 2. As a commercial venture, it is assumed that Cascade Natural Gas Corporation will respond to market-driven demands for system upgrades to serve future development.

Communications

Grant County PUD owns and manages fiber communications facilities at the *GCIA Employment Center* site and leases capacity on the fiber to local internet service providers. Fiber communication facilities are located in Randolph Road all the way through the site.

Century Link provides POTS ("plain old telephone service" using copper conductors) in the *GCIA Employment Center* site. Additionally, the Moses Lake area is well served by major cellular phone providers.

It is assumed that all communications providers mentioned would respond to market-driven demands for system upgrades to serve future development.

No Action Alternative

Under the No Action Alternative no new development or infrastructure improvements would be developed on the *GCIA Employment Center* site at this time. The site would remain in its partially developed condition, and there would be no new impacts to utilities. The existing utility systems would likely be maintained.

3.12.3 Mitigation Measures

Required/Proposed Mitigation Measures

The following required/proposed mitigation measures would address the potential utility impacts associated with development of the *GCIA Employment Center* site under Alternatives 1 and 2.

Water

- The Larson zone of the City of Moses Lake water system has adequate capacity to accommodate a level of development between Phase 1 and Phase 2 under Alternative 1 (approximately 3 million square feet) and a level of development between Phase 2 and Phase 3 under Alternative 2 (approximately 5 million square feet), including a two percent background growth factor. However, additional water system wells would need to be drilled to serve full build-out of Alternative 1, and would likely be necessary for full build-out of Alternative 2 (Alternative 2 would use most of the existing capacity of the Larson zone).

- The City would monitor water demand by screening development applications to determine anticipated generation rates for development. The overall City system is projected to have capacity to meet the Larson zone water needs and would provide a supply buffer as plans are developed for well drilling and expansion of the Larson zone supply and distribution system once development demand approaches system capacity.

Sanitary Sewer

- The City of Moses Lake Larson Treatment Plant has capacity to treat a level of assumed development between Phase 2 and Phase 3 under Alternative 1 (approximately 5 million square feet) and an assumed level of site development between Phase 1 and Phase 2 under Alternative 2 (approximately 3.5 million square feet), including a two percent background growth factor. However, the City would require an increase in treatment capacity to accommodate flows associated with full build-out of both Alternatives.

- The City would monitor the sewage treatment capacity by screening development applications to determine anticipated sewage generation rates for the proposed development. The City would monitor projected incoming flows through the screening process and begin plans for expansion when the facility reaches 80 percent capacity, which is anticipated to occur around 2024 (see **Figure 3.12-3**).

- The Port of Moses Lake industrial wastewater treatment system has some capacity to treat additional volumes of industrial wastewater. The Port is presently designing an expansion of the land application system that is anticipated to meet the projected demands of subscribed users, and also meet the demands projected for Phase 1 of Alternative 2. However, additional expansion of the system beyond the current planned expansion would be required to fully accommodate Phase 1 of Alternative 1 and full build-out of both Alternatives 1 and 2.

Electrical

- GCPUD can accommodate incremental new development with power demand loads that total less than 5 megawatts. However, new industries moving into the site that have power demands in excess of 5 megawatts would be required to enter into a "Facility Cost Contribution" arrangement with GCPUD, the proceeds of which are used to expand the electrical distribution system infrastructure to the extent required to serve the industry contributor. GCPUD has indicated that a new substation would have the capacity to serve an approximately 78 megawatt electrical load, which is large enough to accommodate build-out under Alternatives 1 and 2.

3.12.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to utilities are anticipated with implementation of the mitigation measures listed above.

Chapter 4

ACRONYMS

CHAPTER 4
ACRONYMS AND DEFINITIONS

ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AFB	Air Force Base
ALS	Advanced Life Support
AMR	American Medical Response
ASPI	Aero-Space Port International
BACT	Best Available Control Technology
BMP	Best Management Practice
BP	Before Present
CARA	Critical Aquifer Recharge Area
CBRW	Columbia Basin Railroad Company
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CH_4	Methane
City	City of Moses Lake
CO	Carbon Monoxide
CO_2	Carbon Dioxide
Commerce	Washington State Department of Commerce
County	Grant County
CTCR	Confederated Tribes of the Colville Reservation
DAHP	Washington State Department of Archaeology and Historic Preservation
DEIS	Draft Environmental Impact Statement
DNR	Washington State Department of Natural Resources
DS	Determination of Significance
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
EPA	United States Environmental Protection Agency
EV	Electric Vehicle
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency

FHWA	Federal Highway Administration
FPARS	Forest Practices Application Review System
GCC	Grant County Code
GCFD #5	Grant County Fire District #5
GCIA	Grant County International Airport
GCPUD	Grant County Public Utility District
GCSO	Grant County Sheriff's Office
GHG	Greenhouse Gas
GLO	General Land Office
GMA	Growth Management Act
GPM	Gallons Per Minute
HI	Heavy Industrial
IBC	International Building Code
IPCC	International Panel on Climate Change
ITE	Institute of Transportation Engineers
KV	Kilovolt
Leq	Equivalent Sound Level
LOS	Level of Service
LOX	Liquid Oxygen
MSAT	Mobile Source Air Toxic
MCL	Maximum Contaminant Level
MGD	Million Gallons per Day
MLFD	Moses Lake Fire Department
MLMC	Moses Lake Municipal Code
MLPD	Moses Lake Police Department
MSAT	Mobile Source Air Toxic
MTCA	Washington State Model Toxics Control Act
MTCO2e	Million Metric Tons of Carbon Dioxide Equivalent
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NCBR	North Columbia Basin Rail
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRHP	National Register of Historic Places

NWI	National Wetland Inventory
OSHA	Occupational Safety and Health Administration
P	Public
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PHS	Priority Habitat Species
PM	Particulate Matter
Port	Port of Moses Lake
POTS	Plain Old Telephone Service
PPM	Parts Per Million
PUD	Public Utility District
RCW	Revised Code of Washington
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAC	Strategic Air Command
SEPA	State Environmental Policy Act
SO2	Sulfur Dioxide
SOC	Species of Concern
SOx	Sulfur Oxides
SQ. FT.	Square Feet
SR	State Route
STB	Surface Transportation Board
SVOC	Semi-Volatile Organic Compounds
TCE	Trichloroethene
TESC	Temporary Erosion and Sedimentation Control
TIGER	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Program
TPH	Total Petroleum Hydrocarbons
TRI	Toxic Release Inventory
TSCA	Toxic Substances Control Act
UGA	Urban Growth Area
UHI	Urban Heavy Industrial
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compound

WAAQS	Washington State Ambient Air Quality Standards
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WHR	Washington Heritage Register
WSDOT	Washington State Department of Transportation

Chapter 5

REFERENCES

CHAPTER 5
REFERENCES

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Chapter 6

DISTRIBUTION LIST

CHAPTER 6

DISTRIBUTION LIST

Tribes

Colville Confederated Tribes

Federal Agencies

United States Bureau of Reclamation
United States Army Corps of Engineers
United States Environmental Protection Agency
United States Department of Fish and Wildlife
Federal Aviation Administration

State Agencies

Washington State Department of Ecology
Washington State Department of Fish and Wildlife
Washington State Department of Archaeology and Historic Preservation
Washington State Department of Natural Resources
Washington State Department of Transportation
Washington State Department of Transportation – Aviation Division

Local Agencies

Grant County Building Department
Grant County Fire Marshal
Grant County Health District
Grant County Public Works Department
Grant County Emergency Management
Grant County Sheriff’s Office
Grant County Fire District #5
Grant County P.U.D
City of Moses Lake Community Development Department
City of Moses Lake Fire Department
City of Moses Lake Police Department

Newspapers and Libraries

Columbia Basin Herald
Moses Lake Library

Appendix A – Geotechnical Report

Appendix B – Critical Areas/Plants & Animals Report

Appendix C – Transportation Tables & Figures

Appendix D – Utilities Maps

Appendix E – Development Assumptions Worksheets

Appendix F – Air Quality/GHGs Report

Appendix G – Noise Report

Appendix H – Historic & Cultural Resources Report

Appendix A

Geotechnical Report

Earth Technical Report
Grant County International Airport
Employment Center Project
Grant County, Washington

June 17, 2015

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1.0 INTRODUCTION

This technical report provides background information and analysis to support preparation of the Earth section of the Draft Environmental Impact Statement (EIS) for the Grant County International Airport Employment Center (Site) project located in Grant County, Washington (Figure 1). This document describes the affected earth environment and existing geologic conditions at the Site, the potential impacts from existing soil and groundwater conditions related to future Site development under the EIS alternatives, potential mitigation measures that could be implemented to address these impacts, and significant unavoidable adverse impacts, as applicable.

This technical report has been prepared to support the environmental review process for the Grant County International Airport Employment Center project. Site-specific subsurface investigations and geotechnical engineering analyses will need to be performed as part of the specific design and permitting of infrastructure and buildings associated with future Site redevelopment.

1.1 PROJECT DESCRIPTION

Based on information provided by EA Engineering, Science and Technology, Inc (EA), we understand that the Port of Moses Lake (Port) is preparing a Planned Action EIS for approximately 1,258 acres of land in the Port, Grant County (County), and the City of Moses Lake (City). The County and Port will act as the State Environmental Policy Act (SEPA) co-lead agencies, with EA contracting directly with the Port. The EIS will analyze two development alternatives (with slightly differing building densities and uses—with one focused on heavy manufacturing and warehousing, and the other on light manufacturing and technology uses—under existing land use designations) and the No Action Alternative. Each of the two development alternatives envision similar building types and loading, with total impervious area generation (rooftops and pavement) on the order of 1,007 to 1,084 acres for Alternatives 2 and 1, respectively.

1.2 SCOPE OF SERVICES

EA retained Landau Associates to provide services related to preparation of the Earth section of the Draft EIS. Our services were provided in general accordance with the scope of services outlined in a signed agreement between EA and Landau Associates, dated February 16, 2016. Our scope of services included the following specific tasks:

- Coordinate with EA, the Port, County, and City regarding existing information pertaining to Site and vicinity geotechnical data, and analysis methodology
- Describe the existing identified geotechnical hazard areas on and adjacent to the Site

- Describe existing soil/geologic/topographic conditions on and in the Site vicinity based primarily on existing information
- Evaluate anticipated earthwork activities associated with construction under the EIS alternatives
- Describe the relationship between development of the EIS alternatives to identified geotechnical hazard areas
- Assess potential for erosion during construction under the EIS alternatives
- Describe the overall suitability of Site soils to accommodate development under the EIS alternatives
- Discuss the relationship of construction under the EIS alternatives to previously contaminated soils and groundwater
- Identify mitigation measures necessary to minimize impacts associated with the proposed Site development
- Complete earth analysis for inclusion in the Draft EIS that will be submitted to the County, Port, and City for review.

2.0 SITE CONDITIONS AND AFFECTED ENVIRONMENT

This section provides a Site description, discusses the general geologic setting of the project area, and describes the surface and subsurface conditions and potential hazards identified throughout the Site. Interpretations of the Site conditions are based on the results of our review of available information.

2.1 SITE DESCRIPTION

The planned Site is composed of approximately 1,258 acres, and is generally bordered by Grant County International Airport on the west, undeveloped land on the north and east, and developed areas on the south and interior (Figure 2). The Site is currently occupied by taxiways, paved areas, and hangars in the south and west and is undeveloped in the north and east.

2.2 PROPOSED PROJECT ALTERNATIVES

Alternative 1 is focused on heavy manufacturing and warehousing, and Alternative 2 is focused on light manufacturing and technology. Alternative 3 assumes no development at the Site. The proposed alternatives are summarized in Tables 1 and 2.

2.3 GEOLOGIC SETTING

The project Site is located in the central portion of the Columbia Basin physiographic province. This province is topographically characterized by incised rivers, plateaus, and anticlinal ridges. The province is generally underlain by Miocene age (about 23 to 5 Ma) basaltic rocks and interbedded Neogene age (about 23 to 2 Ma) sediments. The Miocene age basalt found in this region was produced by four distinct flood basalt formations: Imnaha Basalt around 17.5 Ma, Grande Ronde Basalt (16.5 to 15.5 Ma), Wanapum Basalt (15.6 to 14.5 Ma), and Saddle Mountains Basalt (14.5 to 6 Ma). Interim periods between extrusion events resulted in sedimentary deposits on top of the basalt flows (DNR website 2015).

In the Pliocene and Pleistocene, sedimentary deposits accumulated in lakes, streams, and rivers; up to 1,000 feet of sediment can be found overlying the basalt in some areas. Glacial outwash during this period produced large volumes of the loess that currently covers much of the Columbia Basin. During the late Pleistocene, the region was subjected to a series of extremely large floods from Glacial Lake Missoula, which was located near the Montana/Idaho border. Between about 12,000 and 15,000 years ago, the ice dam impounding Glacial Lake Missoula repeatedly failed, scouring the Spokane Valley and Columbia Basin. The floods drastically changed the landscape, carving the Channeled Scablands and depositing sands and gravels throughout the region (DNR website 2015). It is these flood-deposited gravels sitting atop basalt bedrock that form the general subsurface profile at the Site, the city of Moses Lake, and immediately adjacent areas, as discussed in the following paragraph.

General surficial geologic information for the project area was obtained from the *Geology of the Moses Lake Quadrangle, Washington* (Grolier and Foxworthy 1961) and *Geologic Map and Sections of parts of Grant, Adams, and Franklin Counties, Washington* (Grolier and Bingham 1971), both published by the U.S. Geological Survey. According to these sources, near-surface deposits in the vicinity of the project Site consist of on the order of 90 to 100 feet (ft) of fluvial gravel. Soil defined as fluvial gravel in this region typically consists of soils ranging in size from boulder and gravel to fine sand that includes generally rounded basalt fragments, but locally contains granitic and metamorphic rock or caliche and Ringold fragments. This unit typically exhibits high to moderate permeability. Within a few inches of the ground surface, a thin soil horizon including plant roots and other organic material is typically present.

2.4 SITE TOPOGRAPHY

The Site is generally flat, with a slight downward slope from west to east. The Site has an elevation change of approximately 50 ft from its highest point near the western edge of the Site to its lowest point in the east-southeast. No steep slopes exist on site.

2.5 GROUNDWATER CONDITIONS

A review of readily available subsurface exploration data for the area in the vicinity of the Site indicates that groundwater, where encountered, is typically greater than 50 ft BGS.

2.6 GEOLOGIC HAZARDS

Washington State's Growth Management Act (Chapter 36.70A Revised Code of Washington) requires all cities and counties to identify critical areas within their jurisdictions and to formulate development regulations for their protection. Among the critical areas designated by the Growth Management Act are geologically hazardous areas, defined as such because of their potential susceptibility to landsliding, seismic or other geologic events, or because of their past use (e.g., landfill). These areas may not be suitable for development consistent with public health and safety concerns without conducting specific studies during the design and permitting process.

The County defines and identifies geologically hazardous areas in the Grant County Unified Development Code (Chapter 24.08, Article VI). Within the city boundary of Moses Lake, geologic hazard areas are defined according to the City of Moses Lake Municipal Code, Chapter 19.03. In general, before development is allowed in or immediately adjacent to critical areas, detailed geotechnical studies must be conducted as part of the permit process to address specific standards relating to site geology and soils, seismic hazards, and facility design.

A discussion of potential geologic hazards at the Grant County International Airport project is provided below.

2.6.1 STEEP SLOPE HAZARDS

Steep Slope Areas are generally defined as those areas that rise at an inclination of 40 percent (2.5H:1V) or more with a vertical change in elevation of at least 10 ft. A steep slope hazards map prepared by the U.S. Department of Agriculture (USDA), shows that no steep slopes are present within the project area.

2.6.2 LANDSLIDE HAZARDS

Generally, landslide hazard areas are defined as:

- Any area with a combination of:
  - Slopes greater than 15 percent
  - Impermeable soils (typically silt and clay) frequently interbedded with granular soils (predominantly sand and gravel)
  - Springs or groundwater seepage
- Any area that has shown movement during the Holocene Epoch (from 10,000 years ago to present) or is underlain by mass wastage debris of that epoch
- Any area subject to instability as a result of rapid stream erosion, stream bank erosion, or undercutting by wave action
- Any area that shows evidence of, or is at risk from, snow avalanches
- Any area located on an alluvial fan that is currently subject to, or potentially subject to, inundation by debris flows or deposition of stream-transported sediments.

Grant County's GIS mapping database provides data related to landslide susceptibility and incidence; the project area is mapped as having a low incidence and susceptibility to landslides.

2.6.3 SEISMIC HAZARDS

Seismic hazard areas are generally defined as those areas subject to severe risk of earthquake damage as a result of ground shaking, ground rupture, soil liquefaction, or tsunamis. Ground shaking can occur large distances from the earthquake source, ground rupture occurs only along the active fault trace, liquefaction requires a certain combination of soil and groundwater conditions at the site, and tsunamis can occur far from a fault rupture or massive landslide in a water body.

2.6.3.1 Ground Shaking and Ground Motion Amplification

The entire Pacific Northwest region lies within a seismically active area, and moderate levels of ground shaking should be anticipated during the design life of structures at the Grant County International Airport Site. Structures at the project Site would likely be founded on medium dense to dense, fluvial gravel, and as a result, ground motion amplification due to soft soil conditions does not present a significant risk at the Site. Seismic design using current design codes and generally accepted engineering standards and practices must be conducted during the design phase of future Site improvements. Seismic design would include use of the applicable version of the International Building Code (IBC), which contains provisions to address life safety issues and incorporates data obtained from recent seismic events in the seismic design standards.

The U.S. Geological Survey and other researchers continue to evaluate the presence and potential effects of fault systems in the Pacific Northwest that could affect seismic hazard assessments in Washington. Accordingly, seismic hazard assessments conducted during the design phase of future Site improvements should use seismic hazard maps and data that have been updated to reflect the most current understanding of potential ground shaking at the project Site.

2.6.3.2 Ground Rupture

The project area is located approximately 16 miles north of the easternmost extent of the Frenchman Hills Fault (the closest mapped active fault). Any future ground rupture that may occur within the Frenchman Hills Fault will likely have no ground rupture impact on the project area.

2.6.3.3 Liquefaction

When shaken by an earthquake, certain loose, generally shallow (less than 80 ft), saturated soil deposits lose strength and temporarily behave as if they were liquid. This phenomenon is known as liquefaction. The Site is not mapped as a potential liquefaction hazard area, and the subsurface conditions reviewed for this EIS-level evaluation indicate that liquefaction is not a significant risk at the Site.

2.6.3.4 Tsunamis

Tsunamis are earthquake-generated waves that occur in open water bodies. The location of the Site indicates that the Site would not be affected by tsunamis.

2.6.4 Erosion Hazards

Erosion hazard areas are defined as those areas containing soils that may experience severe to very severe erosion from construction activity. The susceptibility to erosion is generally a function of soil type, topography, occurrence of groundwater seepage or surface runoff, and the built environment.

According to the USDA Erosion Hazards map (USDA website 2015), a small portion of the west side of the Site is considered a severe erosion hazard. However, erosion can be adequately managed or prevented entirely by proper construction practices and by properly designed and maintained drainage and erosion control measures. Proper erosion and sediment control measures should be included for any development at the project Site that includes earthwork of any kind.

2.6.5 Settlement Hazards

The project Site and adjacent areas are not known to be underlain by loose/soft compressible deposits that could be subject to significant amounts of settlement due to loads imposed by heavy buildings or placement of fill materials as part of Site regrading or retaining wall construction.

2.6.6 Other Hazards

2.6.6.1 Coal Mine Hazards

No coal mine areas are mapped in or adjacent to the Site (Grant County website 2015; City of Moses Lake website 2015).

2.6.6.2 Flood-Prone Areas

The Site is not situated in a flood-prone area (Grant County website 2015; City of Moses Lake website 2015).

2.6.6.3 Volcanic Hazards

The Site is not situated in a volcanic hazard area (Grant County website 2015; City of Moses Lake website 2015).

2.7 CONTAMINATED SOIL AND GROUNDWATER

Some of the Site and surrounding areas include portions of the former Larson Air Force Base. Base operations, including aircraft movements, maintenance, fabrication, and related activities by the U.S. Air Force and associated aerospace suppliers created areas of contaminated soil and groundwater. The U.S. Environmental Protection Agency (EPA) has designated portions of the former base and surrounding areas as the Moses Lake Wellfield Superfund Site and has been overseeing soil and groundwater cleanup efforts since 1992 (EPA 2014). Three trichloroethene (TCE) plumes have been identified within the former base boundaries, near the southern extent of the EIS study area. In addition, 39 contaminated soil sites have been identified within the former Air Force base; some of these locations coincide with the EIS study area. Soil contaminants identified at these locations include heavy metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), petroleum hydrocarbons, asbestos, perchlorate, and discarded military munitions (EPA 2008).

It is expected that excavation into the subsurface during construction could encounter contaminated soil, depending on the excavation location within the project area and its relation to the contaminated soil sites. Impacts to human health are possible during construction activities, depending on the contaminant, exposure routes, and other factors. Health impacts during operation and use of particular buildings that will be constructed at the Site are also possible, depending on the above-noted factors. As examples, special building ventilation and vapor-barrier considerations might be necessary when building atop soils with significant concentrations of VOCs, or special pipe materials might be necessary in soils with perchlorate contamination. During design and construction of buildings, pavement, utilities, and other earth-disturbing infrastructure, specific impacts and mitigation measures will need to be identified on a case-by-case basis and with reference to previous Site uses, contaminants present, and other factors.

Groundwater impacts could be created as a result of Site development. Stormwater runoff and collection from impervious surfaces could locally modify the underlying groundwater table, especially if infiltration of stormwater runoff results in mounding or other changes to the groundwater gradient around the three known TCE plumes. Improper siting of stormwater infiltration facilities could also accelerate the transport of soil contaminants into the groundwater table. During siting, design, and operation of stormwater infiltration facilities, specific impacts and mitigation measures will need to be identified on a case-by-case basis and with reference to previous Site uses, contaminants present, effect upon the groundwater table, known plume locations, and other factors.

3.0 EARTH IMPACTS FOR REDEVELOPMENT ALTERNATIVES

This section evaluates the potential effects that the existing earth environment at the Site could have on redevelopment under the EIS alternatives, as well as how the alternatives could affect the earth environment at the Site during construction and long-term operation. An example of an impact associated with the existing earth environment would be potential landsliding of existing soils. An example of a construction-related impact would be temporary excavations for building foundation construction. For identified impacts, some potential mitigation measures are noted in this section.

Specific foundation support systems used for onsite improvements would be determined as part of the Site-specific design and permitting of infrastructure and individual buildings associated with future Site redevelopment. Based on the presence of generally competent soil conditions throughout the project Site, it is anticipated that foundation support for most structures would likely be able to be provided by conventional spread footings or mat foundations.

The project Site's history as a former Air Force base and its current status as a Superfund site—for both soil and groundwater contaminants—means that any earth-disturbing activities or activities that influence the groundwater table will need to consider impacts to existing contaminant locations and ongoing remediation.

3.1 GEOLOGIC HAZARD IMPACTS

Geologic hazard impacts, discussed below, are in terms of how existing geologic conditions at the Site could affect the proposed development alternatives. Implementation of effective design and construction techniques, as well as selecting appropriate foundation and earth retention systems, can mitigate many of the potential impacts from geologic hazards.

3.1.1 STEEP SLOPES AND LANDSLIDING

Site redevelopment activities within the project area are anticipated to have no impact in terms of affecting steep slopes or increasing landslide potential.

3.1.2 GROUND SHAKING

The entire Pacific Northwest region lies within a seismically active area. The potential for moderate levels of ground shaking should be considered during the specific design and permitting process for future Site improvements. Seismic design using the most recent design codes and generally accepted engineering standards and practices should be conducted during the design phase of future Site improvements. This includes conducting Site-specific seismic analyses when appropriate, and use of the most recent version of the IBC, which contains provisions to address life safety issues and incorporates data obtained from recent seismic events in the seismic design standards.

3.1.3 Ground Rupture

The eastern extent of the Frenchman Hills Thrust Fault is located approximately 16 miles south of the project area. Future ground rupture could potentially occur along the Frenchman Hills Fault; however, the actual risk at the Site posed by such ground rupture is considered to be very low given that the fault is located 16 miles away and the return period for large earthquakes on the Frenchman Hills Fault that may rupture the ground surface is on the order of thousands of years. Consequently, design against ground rupture would not likely be a significant part of the Site-specific seismic design for future Site improvements. Seismic design using the most recent design codes and generally accepted engineering standards and practices must be conducted during the design phase of the future Site improvements.

3.2 CONSTRUCTION IMPACTS AND MITIGATION

Construction impacts are short-term impacts that could occur during the construction phase of Site redevelopment. Implementation of effective design and construction techniques and selecting appropriate foundation and earth retention systems can mitigate the potential construction impacts related to the earth environment.

3.2.1 Erosion

The soils anticipated at the Site generally have slight to moderate erosion hazards; with the exception of a small area of soils in the western portion of the Site that has a severe erosion hazard. A combined cut/fill volume for each of Alternatives 1 and 2 is anticipated to be approximately 2.7 million cubic yards; no earthwork is expected for Alternative 3. Site grading and construction associated with the EIS development alternatives could cause erosion of exposed soil and soil stockpiles, which could potentially result in onsite and offsite transport of sediment. However, proper use of temporary erosion and sedimentation control (TESC) measures and best management practices (BMPs) would be implemented during construction of future Site improvements to reduce the potential for erosion-related impacts.

During construction, contractors would employ TESC measures and BMPs to control erosion. These measures would be consistent with County critical area and grading regulations, and could include the following:

- Limit areas of exposure
- Schedule earthwork during drier times of the year
- Retain vegetation where possible

- Seed or plant appropriate vegetation on exposed areas as soon as earthwork is completed
- Route surface water through temporary drainage channels around and away from disturbed soils or exposed slopes
- Intercept and drain water from any surface seeps, if encountered
- Use silt fences, temporary sedimentation ponds, or other suitable sedimentation control devices to collect and retain eroded material
- Cover exposed soil stockpiles and exposed slopes with plastic sheeting, as appropriate
- Use straw mulch and erosion control matting to stabilize graded areas and reduce erosion and runoff impacts to slopes, where appropriate
- Incorporate contract provisions allowing temporary cessation of work under certain, limited circumstances, if weather conditions warrant
- Construct stabilized construction entrances with rock pads or truck washing stations to limit excess soil materials from leaving the Site.

3.2.2 CONSTRUCTION EXCAVATIONS

Temporary excavations would be required for the installation of future structures and infrastructure, including new/upgraded underground utilities, roadways, earth retention structures, etc. Without mitigation, these excavations could have a potentially adverse effect on immediately adjacent existing and future structures (i.e., structures within a distance equal to about the depth of the excavation), utilities, and other improvements. However, standard construction measures, such as the use of properly designed and installed temporary excavation shoring systems, and properly constructed open excavations, would reduce the potential for such adverse impacts.

Impacts associated with temporary construction excavations would be mitigated using properly designed and constructed excavation shoring systems. The design and construction of excavation shoring systems would include an evaluation of nearby adjacent structures and utilities and incorporate measures to limit impacts to adjacent structures and utilities.

3.2.3 PLACEMENT OF STRUCTURAL FILL

The redevelopment alternatives would require various amounts of site grading and placement of structural fill (2.7 million cubic yards for Alternatives 1 and 2) associated with construction/modification of access roads, installation of utilities, construction of earth retention structures, local raising of site grades, etc. Structural fill and backfill material placed as part of future Site improvements should be densely compacted, which can cause ground vibrations in the immediate vicinity of the construction work. However, significant settlement/ ground subsidence due to placement of structural fill that could affect existing or future structures (onsite or offsite) in the immediate area of the fill is not expected.

Designing the fill to control adjacent settlements could mitigate any ground subsidence effects. In addition, adjacent structures/surfaces could be monitored during construction to verify that no adverse settlement occurs.

3.2.4 FOUNDATION CONSTRUCTION

Based on the presence of generally competent soil conditions over most of the Site, it is anticipated that foundation support for most structures would likely be able to be provided by conventional spread footings and mat foundations, although drilled shaft foundations may be selected during design for certain locations and/or building types. Foundation construction would typically require temporary excavation shoring, which could result in the potential impacts and use of mitigation measures discussed above for those construction activities.

Proper design and construction of temporary excavation shoring could mitigate foundation construction impacts. For further monitoring of foundation construction impacts, ground elevation surveys in conjunction with pre- and post-construction inspections and photographic surveys of structures or facilities located near foundation construction activities could be conducted.

3.2.4.1 Conventional Spread and Mat Foundations

Conventional spread footings and mat foundations would use standard construction methods and equipment; significant noise, vibration, or settlement impacts are not expected. Excavated soil would either be reused on site as structural fill (if determined to be suitable for that purpose), or transported off site to an appropriate disposal location. The size and depth of building foundations could vary across the Site and would be determined as part of the Site-specific design of individual structures. The size and depth of foundations would depend on various factors that include the building loads, elevation of the lowest parking level (if any), and Site-specific soil and groundwater conditions.

3.2.4.2 Drilled Shafts

Foundation support of certain buildings could potentially include drilled shafts. Caving soils, soil heave, and large obstructions can affect the construction of drilled shafts. The installation of drilled shafts generally does not produce significant vibrations; however, installation of temporary casing can produce ground vibrations and localized ground settlement around the shaft construction area. Drilled shafts create relatively large volumes of spoils and may require dewatering. Potential mitigation measures for drilled shafts include using casing to control caving soils and monitoring the adjacent ground surface during construction.

Installation of casing could mitigate caving soils during drilled shaft installation for deep foundation support of structures. Spoils generated during drilled shaft installation would be disposed of in accordance with applicable local, state, and federal requirements.

3.2.5 CONSTRUCTION DEWATERING

Due to the relatively deep depth to groundwater anticipated at the project Site, it is anticipated that construction dewatering will not be necessary, and so dewatering impacts to the subsurface environment are unlikely.

3.2.6 OPERATION IMPACTS

No potential geotechnical operational impacts of the EIS alternatives that are associated with the existing earth environment at the Site, other than the potential impact noted below, have been identified. Ongoing earth impacts related to infiltration of stormwater runoff could occur as a result of Site development. Siting design and operation of infiltration facilities should consider the potential for design-specific impact mitigation to existing soil and groundwater contaminants, plus impact mitigation to remediation efforts currently underway.

Soil and groundwater contaminants could create impacts to the built environment. For example, VOC vapors could migrate within the backfill envelope surrounding buried utilities, or accumulate beneath on-grade floor slabs and paved surfaces. Check dams, subgrade ventilation, vapor barriers, and other mitigation strategies could all be incorporated into design and construction. Concrete construction and installation of utilities in areas with soils with corrosive contaminants could be completed with separation gravel courses, special cements, cathodic protection, or other mitigation strategies, as appropriate.

3.2.7 INDIRECT IMPACTS

No potential indirect impacts of the EIS alternatives that are associated with the existing earth environment at the Site have been identified.

3.2.8 IMPACTS DUE TO EXCAVATION IN CONTAMINATED SOILS

Areas of soil contamination exist within the EIS project area, as discussed in Section 2.6. Excavations in these areas could generate contaminated excavation spoils. Depending upon the contaminant and its concentration, excavation spoils may require transport and disposal as solid hazardous waste. Other mitigation strategies may be practical, as determined during design. Impacts to worker health could occur as a result of earthwork, utility construction, and other activities in areas of contaminated soils.

These impacts may need to be observed during construction using airspace monitoring, special protective clothing, or other workplace safety strategies.

The designer should consider the concentration, depth, and types of soil contaminants likely to be encountered at a given location, as revealed by a thorough review of existing environmental documentation of the former Air Force Base and current Superfund site. Additional environmental characterization of existing conditions is likely necessary at some locations prior to final design.

4.0 SUMMARY OF MITIGATION MEASURES

Earth impact mitigation measures are primarily anticipated to be accommodated during design and construction using conventional methods:

- Seismic impacts to structures can be mitigated through code-based seismic design using the most recent version of the International Building Code (ICC 2011).
- Erosion impacts can be mitigated using conventional measures, including proper construction phasing, use of temporary and permanent vegetations, and other methods.
- Impacts to areas of contaminated soils can be mitigated by thorough characterization and delineation during grading design, followed by thorough monitoring and recording of contaminated soils excavated/disturbed during construction. Disposal protocols for contaminated soils would be developed during design and adhered to during construction.
- Impacts to structures due to contaminated soil must be assessed during design and construction. Mitigation of these impacts may include special design, special materials, and special installation methods.
- Impacts to areas of contaminated soils must be considered when siting and sizing stormwater infiltration facilities.
- Impacts to the local groundwater table—plus impacts to the ongoing groundwater treatment efforts—must be considered when siting and sizing stormwater infiltration facilities.

5.0 SIGNIFICANT UNAVOIDABLE IMPACTS

Significant unavoidable adverse earth impacts related to the Planned Action are not anticipated. Measures for the EIS alternatives are available to mitigate anticipated impacts.

6.0 USE OF THIS REPORT

Landau Associates prepared this report for the exclusive use of EA Engineering, Science and Technology, Inc. for specific application to preparation of the Earth section of the Draft Environmental Impact Statement for the proposed Grant County International Airport project near Moses Lake, Washington. Use of this report by others or for another project is at the user's sole risk. Within the limitations of scope, schedule, and budget, Landau Associates' services have been conducted in accordance with generally accepted practices of the geotechnical engineering profession; no other warranty, express or implied, is made as to the professional advice included in this report.

We appreciate the opportunity to provide our services on this project and look forward to assisting you throughout the project. If you have any questions or comments regarding the information contained in this report, or if we may be of further service, please call the undersigned at (425) 778-0907.

LANDAU ASSOCIATES, INC.

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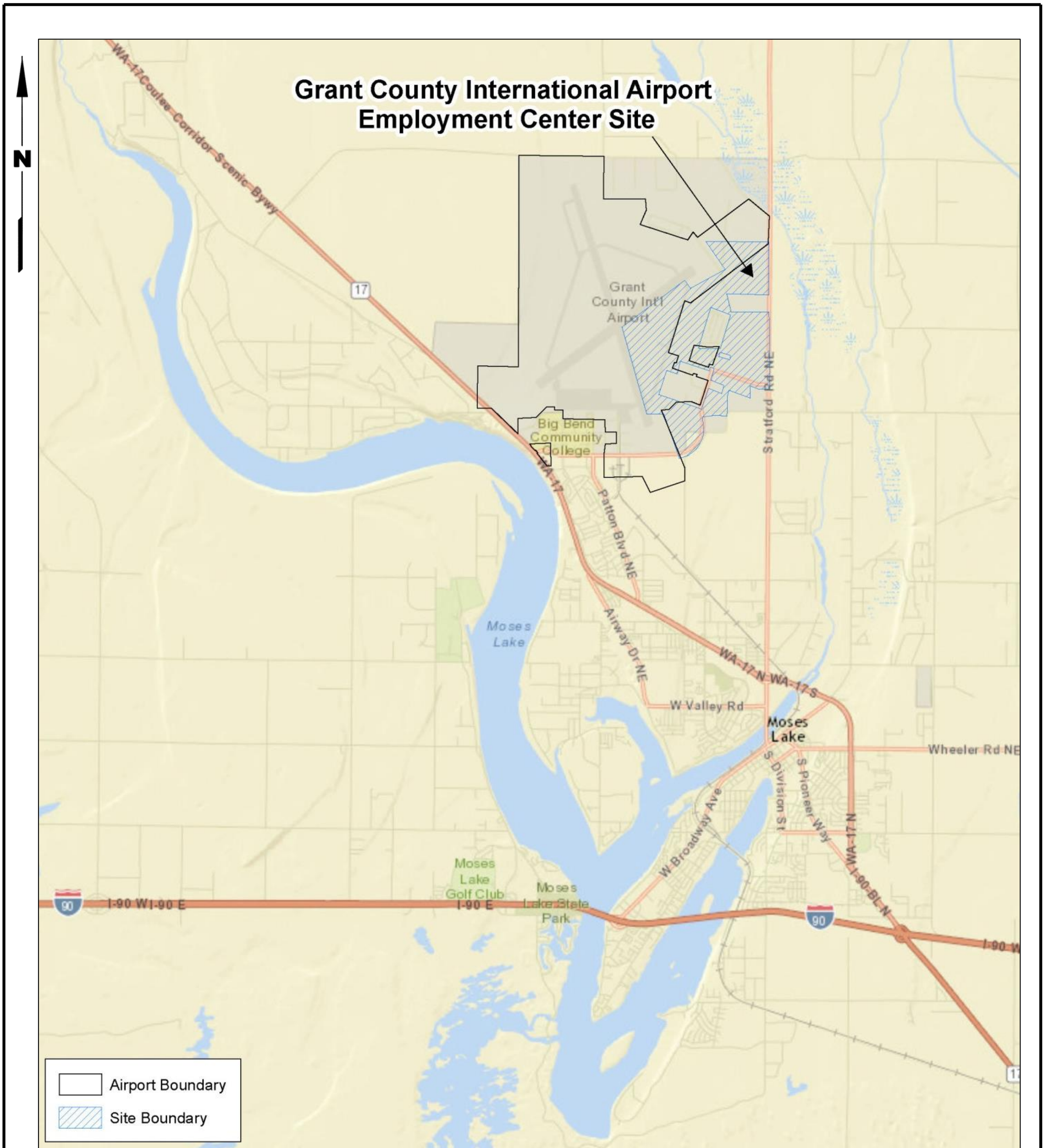

Source: EA, Esri, and OpenStreetMap 2015

Grant County International Airport Moses Lake, Washington	**Vicinity Map**	Figure 1

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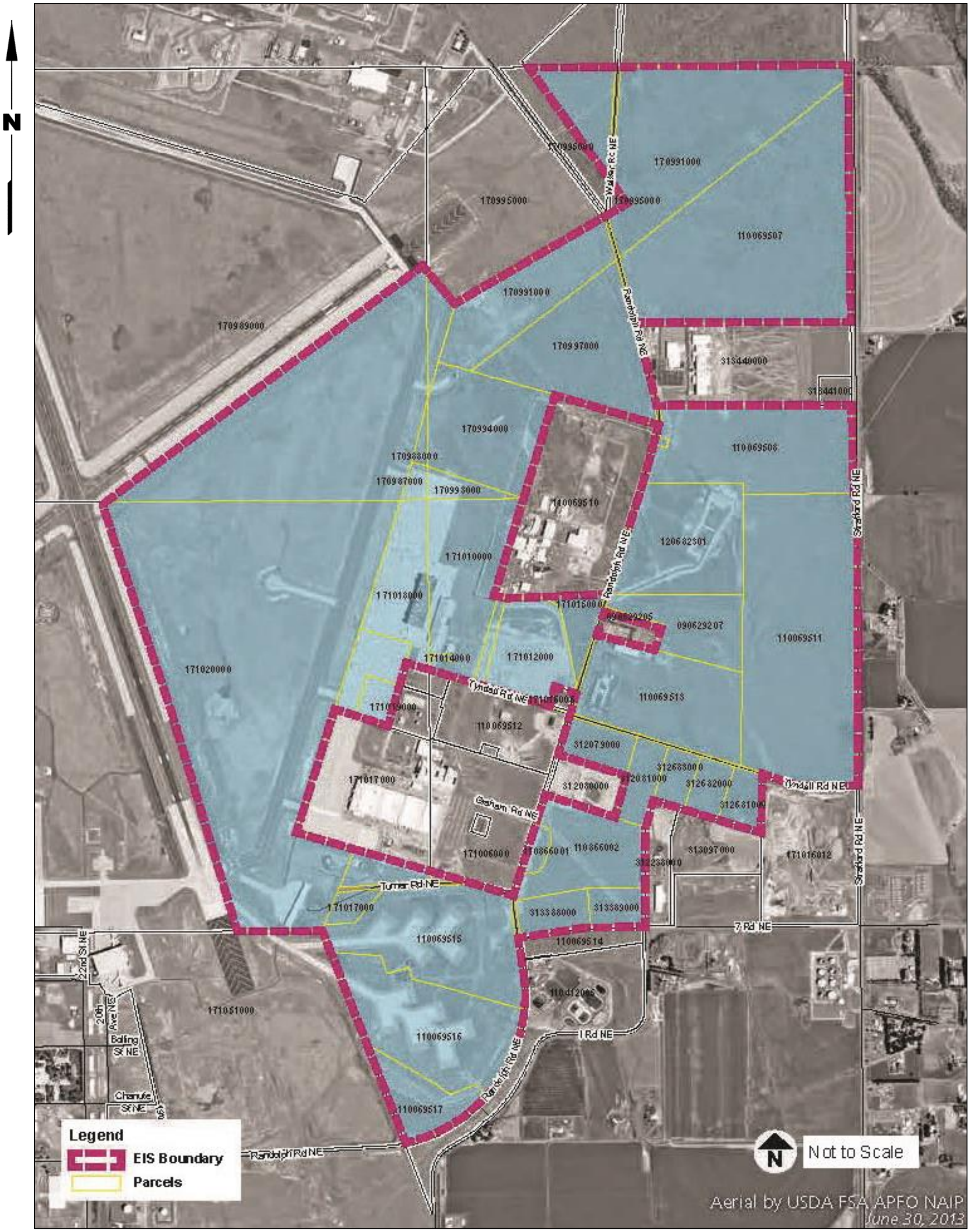

Source: Reid Middleton 2015

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Grant County International Airport Moses Lake, Washington	**Existing Site Parcel Map**	Figure 2

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TABLE 1
SUMMARY OF ALTERNATIVES
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

Features	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis[1]	Alternative 2 Light Manufacturing/ Technology Emphasis[2]	Alternative 3 No Action Alternative
Site Area (acres)			
Port-owned Properties	485	485	485
City-owned Properties	47	47	47
Privately-owned Properties	726	726	726
Total	1,258	1,258	1,258
New Building Area (sq. ft.)			
Aviation Development	2,245,460	2,245,460	
Revenue Support	274,494	548,897	
Heavy Industrial	6,289,693	7,290,967	
Total	8,809,647 [3]	10,085,324 [4]	0
New Employees (jobs)			
Aviation Development/ Revenue Support	2,994	2,994	
Heavy Industrial	10,585	16,016	
Total	13,519 [5]	19,010 [6]	0
Recommended Parking (stalls)	5,602 [7]	14,640 [8]	0

Source: *Reid Middleton, 2015.*

Assumptions:

1 *Approximately 70% heavy manufacturing and 30% warehouse uses.*

2 *Approximately 70% light manufacturing and 30% technology uses.*

3 *Heavy manufacturing uses would occupy 528 acres and develop at a floor area ratio (FAR) of 0.20; warehouse uses would occupy 239 acres and develop at a FAR of 0.25. All buildings would be one-story, with the FARs taking into account the road frontage landscaping required by City of Moses Lake and the 8% of gross area in landscaping required by Grant County.*

4 *Light manufacturing uses would occupy 528 acres and develop at a FAR of 0.25; technology/laboratory uses would occupy 239 acres and develop at a FAR of 0.30. All buildings would be one-story, with the FAR taking into account the road frontage landscaping required by City of Moses Lake and the 8% of gross area in landscaping required by Grant County.*

5 *Aviation development employees are based on 750 sq. ft. of building area per employee; heavy manufacturing/warehouse employees area based on 601 to 627 sq. ft. of building area per employee.*

6 *Aviation development employees are based on 750 sq. ft. of building area per employee; light manufacturing/technology employees are based on 466 to 509 sq. ft. of building area per employee.*

7 *Recommended parking is based on 0.5 parking stalls/1,000 sq. ft. of airport development building area and 0.75 stalls/1,000 sq. ft. of heavy manufacturing/warehouse building area, per guidance from the Institute of Transportation Engineers (ITE) Parking Generation, 4th Edition (2010).*

8 *Recommended parking is based on 0.6 stalls/1,000 sq. ft. of airport development building area, 0.75 stalls/1,000 sq. ft. of heavy manufacturing/warehouse building area and 2.84 stalls/1,000 sq. ft. of light manufacturing/technology building area, per guidance from the ITE Parking Generation, 4th Edition (2010).*

TABLE 2
POSSIBLE ACTIVITIES UNDER PROPOSED ALTERNATIVES
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

Land Use Designation/Zoning	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis	Alternative 2 Light Manufacturing/ Technology Emphasis	Alternative 3 No Action Alternative
Airport Operations	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions
Aviation Development	• Fixed base operators[1] • Specialized aviation service operations[3] • Aircraft maintenance • Retail fueling services • Warehouse (aircraft hangars)	• Fixed base operators[2] • Specialized aviation service operations[4] • Aircraft equipment sales/rentals • Vocational schools (flight training)	• Continuation of existing conditions
Revenue Support	• Facilities for manufacturing, processing &/or assembly of products • Warehouses	• Airport-related facilities[5] • Research facilities, testing laboratories • Vocational schools	• Continuation of existing conditions
Heavy Industrial	• Machine shop • Welding or metal fabrication • Heavy industrial; manufacturing, processing or packaging • Heavy construction equipment storage, sales & rental • Warehousing & distribution facilities • Bulk fuel storage • Transportation services (e.g., freight consolidation)	• Light industrial • Light manufacturing • Technological uses (e.g., laboratories)	• Continuation of existing conditions
Public Facilities	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions

Source: *Grant County Unified Development Code; City of Moses Lake Municipal Code; Port of Moses Lake Draft Final Airport Master Plan, June 2014.*

[1] *e.g., fueling, hangaring & aircraft maintenance.*

[2] *e.g., aircraft rental & flight instruction.*

[3] *e.g., airframe & power plant maintenance; avionics maintenance & sales; & aircraft restoration, painting, & refurbishing.*

[4] *e.g., flight training; air transportation to general public for hire; aircraft rental; aircraft sales; specialized flying services; & commercial skydiving.*

[5] *e.g., aviation-related or support businesses that do not require access to the airfield (e.g., rental car facilities; & aviation supply, equipment & pilot accessory sales)*

Appendix B

Critical Areas/Plants and Animals Report

Environmental Impact Statement Sections
Plant and Animal Habitat Analyses

Port of Moses Lake, Grant County Airport
Moses Lake, Washington

for
EA Engineering, Science and Technology, Inc.

June 4, 2015

GeoEngineers
Earth Science + Technology

Environmental Impact Statement Sections
Plant and Animal Habitat Analyses

Port of Moses Lake, Grant County Airport
Moses Lake, Washington

for
EA Engineering, Science and Technology, Inc.

June 4, 2015

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Environmental Impact Statement Sections
Plant and Animal Habitat Analyses

Port of Moses Lake, Grant County Airport
Moses Lake, Washington

File No. 03429-006-00

June 4, 2015

Prepared for:

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Table of Contents

1.0 INTRODUCTION

The following sections were developed for inclusion in the EA Engineering, Science and Technology (EA) Environmental Impact Statement (EIS) for the Grant County Airport. At the request of EA, this text has been formatted as a report to also be included as appendix to the EIS. For additional project information and descriptions of project alternatives please refer to the complete EA EIS for which these sections were prepared.

2.0 DEVELOPMENT CONSIDERATIONS

For aquatic critical areas, including wetlands and streams, permit requirements would include applicable federal, state and local jurisdictional authorities. Burrowing owls are not federally listed, but are a state candidate species, therefore, permit requirements would be regulated by Grant County and the City of Moses Lake and include management guidance from Washington Department of Fish and Wildlife (WDFW).

2.1 Federal Permits

Federal permits related to the Clean Water Act (CWA) and the Rivers and Harbors Act, in general, are administered by the U.S. Army Corps of Engineers (USACE) and are triggered by impacts to Waters of the United States (U.S.). There are other potential federal nexus (including federal funding or federal land) that would require consultation on NEPA and federally listed species.

2.1.1 Wetlands

If a federal permit is required, compliance with other federal regulations may also be required including, but not limited to, compliance with the Endangered Species Act (ESA) and National Historic Preservation Act (NHPA). Avoiding or minimizing placement of fill and/or structures within waters of the U.S. may reduce permit requirements or potentially the need for a federal permit. During our site assessment, no waters of the U.S. were identified on the project site and, therefore, a federal permit may not be triggered.

2.1.2 Fish and Wildlife Habitat

Since burrowing owls are not federally listed, there should be no federal permit requirements related to burrowing owl habitat within the project site.

2.2 State Permits

State permits are regulated through multiple agencies that include, Washington State Department of Natural Resources (DNR), Washington State Department of Ecology (Ecology) and WDFW. Depending on the location and type of project, it may only require following guidance from state agencies through local permit requirements.

2.2.1 Wetlands and Streams

State aquatic permits may be triggered by:

- Regulated activities within a wetland that is considered a Water of the State or hydrologically isolated.

- Regulated activities within fish-bearing waters that would be subject to the state hydraulic code (Washington Administrative Code [WAC] 220-110). The site does not contain fish habitat.

Since wetland and stream habitat was not identified within the project area, state permits for impacts to wetlands and streams likely would not be triggered.

However, there is a potential for the Ecology to require a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit and Coverage. It is required for construction activities on sites that total one acre or more of disturbance and that result in a discharge of stormwater or storm drains to surface water. This permit is issued by Ecology and requires a Stormwater Pollution Prevention Plan. This would likely be an individual permit requirement for each proposed future development project.

2.2.2 Fish and Wildlife Habitat

Though there may not be regulatory permits required at the state level for fish and wildlife habitat, state agencies such as WDFW and Ecology could provide input for the project during this EIS process. In addition, it is likely that the City of Moses Lake and Grant County would include input from state agencies in their review process for specific development projects.

2.3 Local Permits

The project site is within the local jurisdiction of Grant County and the City of Moses Lake. Both jurisdictions regulate not only activities within wetlands and streams, but also activities within critical area buffers and habitat conservation areas.

2.3.1 Wetlands and Streams

Development activities proposed within jurisdictional wetlands and/or wetland buffers are subject to critical areas review by Grant County and City of Moses Lake, as required under the Washington State Growth Management Act. Mitigation sequencing dictates that efforts be made to avoid, minimize and then compensate for adverse impacts to regulated critical areas and associated buffers (Grant County Code [GCC] Chapter 24.08 and Moses Lake Municipal Code [MLMC] 19.06.040). In general, the preferred sequence of mitigation, is to: 1) avoid the impact; 2) minimize the impacts; and 3) compensate for the impacts with mitigation.

No wetlands or streams were identified during the field investigation. Therefore, there should be no local permit requirements related to wetlands or streams.

2.3.2 Fish and Wildlife Habitat

The project vicinity is considered a habitat conservation area according to Grant County Code (24.08.300) and City of Moses Lake Municipal Code (19.03.170) because the project area contains suitable habitat for several state candidate species (e.g., burrowing owl, striped whipsnake, sagebrush lizard, ferruginous hawk, golden eagle, greater sage-grouse, loggerhead shrike, sagebrush sparrow, Merriam's shrew, Preble's shrew; see Table 1). According to both jurisdictions, habitat conservation areas must be protected and development permits would only be approved if impacts to the habitat conservation areas are mitigated. Projects are required to avoid, minimize and mitigate for potential impacts. In addition, protections such as buffer zones, preservation of critically important vegetation, and limiting access to the conservation area may be required.

3.0 METHODOLOGY

3.1 Data Review

Existing information was collected and reviewed for wetlands, streams, plants, fish and wildlife that may occur within the project vicinity. The search for pertinent and applicable data and maps consisted of a review of the United States Geological Survey (USGS) topographic map, the WDFW Priority Habitat and Species (PHS) maps and database, National Wetlands Inventory (NWI) Maps, and the United States Department of Agriculture – National Resource Conservation Service (USDA–NRCS) web soil survey. Additional information was obtained from DNR Forest Practices Application Review System (FPARS) and WDFW SalmonScape mapping application. In addition, aerial photographs from Google were reviewed of the project site to identify potential vegetation changes, existing areas of development and other potential habitat features.

3.2 Field Reconnaissance

GeoEngineers biologists conducted field reconnaissance on March 18, 2015, to identify potential wetland and stream conditions and characterize fish and wildlife habitat conservation area conditions within the project area. Special consideration was given to areas where project activities may occur within vegetated areas, fish and wildlife habitat conservation areas, wetlands, streams and/or buffers.

3.2.1 Wetland and Stream Evaluation

Wetland and stream site reconnaissance was conducted in accordance with guidelines presented in MLMC Title 19, Chapter 19.06 and GCC Title 24, Chapter 24.08. The Washington State Wetlands Identification and Delineation Manual (Ecology, 1997), the USACE Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE, 2008) were used to evaluate for the presence of wetlands. The evaluation for the presence of streams was conducted by looking for signs of Ordinary High Water (OHW) such as breaks in the topography, drift lines, shifts in vegetation and signs of water marks, according to USACE protocol as referenced from Regulatory Guidance Letter (No. 05-05), Ordinary High Water Mark (OHWM) Identification, December 7, 2005. The WAC was also referenced for the definition of OHWM (WAC 173-22-030 § 11).

3.2.2 Plants, Fish and Wildlife Evaluation

The presence of plants, fish and wildlife species or their suitable habitat was evaluated through review of available literature as well as general field observations. Sources of literature consulted prior to the field investigation included possible wildlife habitat relationships as documented by Johnson and O'Neil (2001), the U.S. Fish and Wildlife Service (USFWS) endangered and threatened species list for Grant County, Washington (USFWS, 2015) and the WDFW PHS map data. We focused primarily on the PHS data to make a determination if regulated wildlife species or habitat conservation areas exist on, or adjacent to, the property. The focus of this evaluation was to document potential wildlife habitat and to make direct observations of physical habitat features (snags, nests, burrows, trails, dens, etc.). Fish and wildlife habitat conservation areas were assessed according to the appropriate municipal code.

4.0 AFFECTED ENVIRONMENT

4.1 Surface Water

No wetlands or streams were identified within the project site during the March 2015 field investigation. WDFW maps an intermittent/ephemeral stream within the project site extending through the north end of the airport and flowing east towards Crab Creek. However, this stream was not identified during the field investigation. The closest surface water features to the site are Crab Creek and Moses Lake, which occur approximately 0.4 miles east and 1.5 miles west of the site, respectively. The NWI identifies two potential wetlands immediately east of the site across Road J NE in an active agricultural field. The presence or absence of these wetlands was not confirmed because these potential wetland features are located on private property outside the project area. However, aerial photograph interpretation indicates that this active farmland does not appear to contain the mapped potential wetland features. Numerous additional wetlands are mapped further east of the site associated with the Crab Creek floodplain (USFWS, 2015).

4.2 Wildlife and Plants

The project site includes portions of the Grant County International Airport and surrounding industrial development, as shown on Figure 2-5 (Conceptual Land Use Map – Alternatives 1 and 2) of the EIS. The remaining portions of the site are largely undeveloped and consist of shrub-steppe habitat with a mix of sagebrush vegetation communities and grasses. Remnants of the previous military and other industrial activities are present in portions of the site including piles of discarded concrete, rock and asphalt. Vegetation within the project area generally consists of shrub-steppe habitat dominated by common rubber brush (*Ericameria nauseosus*) and sagebrush species (*Artemisia* spp.) with sparse amounts of yarrow (*Achillea millefolium*) and various grasses.

The project site and vicinity likely provide habitat for wildlife including resident and migratory birds, reptiles, and small to medium-sized mammals such as rodents, shrews and coyotes. Evidence of wildlife at the project site included observations of various songbirds, coyote scat, a rodent skull and numerous mammal burrows found throughout the approximately 1,200-acre project site.

The potential for the presence of species listed under the federal Endangered Species Act and/or listed as Priority Species by the State of Washington is described below. No fish or amphibians are included below because the site does not contain aquatic features. Table 1 below summarizes federal and state listed species data for the project site. Critical habitat for listed species was not identified or mapped within the project site. For the purposes of this document, the following definitions have been used when discussing suitable habitat, critical habitat and priority habitat:

- **Suitable Habitat**: habitat that contains features or characteristics that are needed for plants and/or wildlife to exist in that area. Typically, suitable habitat would be capable of supporting viable plant and/or animal populations.
- **Critical Habitat**: a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection (USFWS, 2015b). Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery.

- **Priority Habitat**: habitat types or elements with unique or significant value to a diverse assemblage of species (WDFW, 2015d). A priority habitat may consist of a unique vegetation type, a dominant plant species, a described successional stage, or a specific habitat feature (WDFW, 2015b).

TABLE 1. GRANT COUNTY PRIORITY WILDLIFE SPECIES

	Common Name	Scientific Name	State Status	Federal Status	Potential to Occur on Site
Reptiles	Striped whipsnake	*Masticophis taeniatus*	C	N/A	Yes – suitable habitat.
	Sagebrush lizard	*Sceloporus graciosus*	C	N/A	Yes – suitable habitat.
Birds	American white pelican	*Pelecanus erythrorhynchos*	E	N/A	No
	Bald eagle	*Haliaeetus leucocephalus*	S	SoC	No
	Ferruginous hawk	*Buteo regalis*	T	SoC	Yes – suitable habitat.
	Golden eagle	*Aquila chrysaetos*	C	N/A	Yes – suitable foraging habitat. No suitable nesting habitat.
	Peregrine falcon	*Falco peregrinus*	S	SoC	No
	Greater sage-grouse	*Centrocercus urophasianus*	T	C	Yes – suitable habitat and mapped approx. 2.5 miles from site.
	Sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	T	SoC	No – suitable habitat present but only known to occur in Lincoln, Douglas and Okanogan Counties.
	Clark's grebe	*Aechmophorus clarkia*	C	N/A	Yes- suitable habitat approx. 1.5 miles from site along Moses Lake shoreline.
	Western grebe	*Aechmophorus occidentalis*	C	N/A	Yes- suitable habitat approx. 1.5 miles from site along Moses Lake shoreline.
	Sandhill crane	*Grus canadensis*	E	N/A	No
	Yellow-billed cuckoo	*Coccyzus americanus*	C	T	No
	Burrowing owl	*Athene cunicularia*	C	N/A	Yes – suitable habitat and mapped within 1.5 miles of site.
	Lewis' woodpecker	*Melanerpes lewis*	C	N/A	No
	Loggerhead shrike	*Lanius ludovicianus*	C	N/A	Yes – suitable habitat.
	Sagebrush (or sage) sparrow	*Amphispiza belli*	C	N/A	Yes – suitable habitat.
Mammals	Merriam's shrew	*Sorex merriami*	C	N/A	Yes – suitable habitat.
	Preble's shrew	*Sorex preblei*	C	N/A	Yes – suitable habitat.
	Townsend's big-eared bat	*Corynorhinus townsendii*	C	N/A	Yes – bats can roost in artificial structures such as buildings; doesn't appear to have natural roosting habitat.

	Common Name	Scientific Name	State Status	Federal Status	Potential to Occur on Site
	Black-tailed jackrabbit	*Lepus californicus*	C	N/A	Yes – suitable habitat.
	Pygmy rabbit	*Brachylagus idahoensis*	E	E	No – suitable habitat present but only known to occur in Douglas County.
	White-tailed jackrabbit	*Lepus townsendii*	C	N/A	Yes – suitable habitat.
	Washington ground squirrel	*Urocitellus washingtoni*	C	C	Yes – suitable habitat.
	Gray wolf	*Canis lupus*	E	E	No – suitable habitat present but no documented wolves in the area.
Invertebrates	Silver-bordered fritillary	*Boloria selene atrocostalis*	C	N/A	No
	Yuma skipper	*Ochlodes yuma*	C	N/A	No

Note:

- E = Endangered, T = Threatened, C = Candidate, SoC = Species of Concern, S = Sensitive, M = Monitored
- Fish and amphibian species are not listed in this table because no streams or other waterbodies (including wetlands) were identified during the field investigation.
- The above list of priority species is from WDFW 2012 distribution of priority species by County and the USFWS species list for the project site. There are no NMFS listed species within the project area due to lack of streams, wetlands and other waterbodies.
- Field survey conducted on March 18, 2015 to document habitat conditions.

4.2.1 Wildlife

Threatened, Endangered, and Sensitive animal species are identified by both federal and state agencies. At the federal level, the USFWS lists threatened and endangered species and designated critical habitats by County. State threatened, endangered and sensitive species lists are maintained by WDFW. Federal and state listed species are described below and included above in Table 1.

4.2.1.1 Federally Listed Species

Pygmy rabbit and gray wolf are listed as federally endangered and yellow-billed cuckoo is listed as threatened. Federal candidate species include Washington ground squirrel and greater sage-grouse, and species of concern include bald eagle, ferruginous hawk and peregrine falcon.

Gray wolf, pygmy rabbit and yellow-billed cuckoo are not expected to occur in the project vicinity. However, the site contains suitable habitat for Washington ground squirrel, greater sage-grouse, bald eagle, ferruginous hawk and peregrine falcon. The likelihood of occurrence of these species within the project area is discussed in Section 4.2.1.4 (Key Wildlife Species Potential to Occur at the Site).

4.2.1.2 Washington State Listed Species

Pygmy rabbit, gray wolf, American white pelican and sand hill crane are listed as state endangered, and greater sage-grouse, sharp-tailed grouse and ferruginous hawk are listed as state threatened. State candidate species include Washington ground squirrel, white-tailed jackrabbit, black-tailed jackrabbit, Townsend’s big-eared bat, Preble’s shrew, Merriam’s shrew, Clark’s grebe, western grebe, golden eagle, burrowing owl, Lewis’ woodpecker, loggerhead shrike, yellow-billed cuckoo, sagebrush (or sage) sparrow, silver-bordered fritillary, and Yuma skipper. Sensitive species include bald eagle, and peregrine falcon while black-crowned night-heron, great blue heron, and prairie falcon are listed as monitored. The likelihood of occurrence of these species within the project area is discussed in Section 4.2.1.4.

4.2.1.3 State Priority Habitat and Species Program

WDFW PHS data depict locations of priority habitats and species. According to the PHS maps, no federally listed terrestrial or aquatic threatened or endangered species are located on, or within, 1,000 feet of the project site.

PHS data map the project area as long-billed curlew (*Numenius americanus*) habitat. Other priority animal sightings within 3 miles of the project site include burrowing owl (*Athene cunicularia*), greater sage-grouse (*Centrocercus urophasianus*), and ring-necked pheasant (*Phasianus colchicus*). Waterbodies within 3 miles (Crab Creek and Moses Lake) of the site include documented occurrences of rainbow trout (*Oncorhynchus mykiss*), shorebird concentrations, and waterfowl concentrations.

As stated in Section 4.2.1.2 (Washington State Listed Species), burrowing owl is a state candidate species and greater sage-grouse is listed as threatened. Ring necked pheasants, rainbow trout, shorebird concentrations and waterfowl concentrations are not state threatened or endangered species.

The only priority habitat mapped on the project site is for long-billed curlew. Priority habitats mapped within 3 miles of the project site include wetland habitat to the east, south and west, and shorebird and waterfowl concentrations to the east.

4.2.1.4 Key Wildlife Species Potential to Occur at the Site

Burrowing Owl

Burrowing owls, a state candidate species, are widespread in the southern part of Washington State, but numbers fluctuate and breeders are limited to areas with suitable burrow sites (Klute et. al., 2003). In most areas numbers of burrowing owls are declining, and losses appear to be pronounced in the channeled scablands, Okanogan Valley and southeast Washington (Smith et al., 1997). According to breeding bird survey data for Washington, there was an estimated 1.5 percent annual decline from 1968 to 2005, which equated to an overall decline of 45 percent (Conway and Pardieck, 2006). Currently, Grant and Franklin Counties hold over half the nest sites in Washington State, occupied or historical (WDFW, 2013).

The western burrowing owl is a grassland specialist distributed throughout western North America, primarily in open areas with short vegetation and bare ground in desert, grassland, and shrub-steppe environments (Klute et. al., 2003; WDFW, 2004a). Burrowing owls are dependent on the presence of mammals (such as ground squirrels), whose burrows are used for nesting and roosting (Klute et. al., 2003; WDFW, 2004). Nests may also be located in natural cavities in small rock outcrops (WDFW, 2004a). Burrowing owl nesting habitat consists of open areas with mammal burrows and they use a wide variety of arid and semi-arid environments, with well drained soils, level areas characterized by sparse vegetation and bare ground (Klute et. al., 2003; WDFW, 2004a). Within Washington State, according to a 1987 survey, approximately 21 percent of identified nests were observed within artificial burrows such as culverts or irrigation pipes and about 75 percent of the nests were found within 50 feet of roadways; this seems to indicate that disturbed artificial situations are often used by burrowing owls within Washington (Klute et. al., 2003).

Much of the undeveloped areas of the project site currently contain shrub-steppe habitat and grassland habitat, which are the burrowing owl preferred habitat. In addition, according to a 2010 Burrowing Owl Site

Assessment Report prepared for an adjacent property, burrowing owl nests were identified within the project area (URS, 2010). Burrowing owls were not identified; however, during a site assessment conducted for the project on March 18, 2015, suitable habitat and potential nest sites (mammal burrows near rock and riprap piles) were discovered in various areas of the property. Therefore, there is potential for the burrowing owl to be found within the project site.

Other Shrub-Steppe Species

Based on preferred habitat characteristics from the above table (Table 1), the species listed below may be present within the project site. These animal species typically occur in shrub-steppe and open grassland habitat areas, both of which occur within the project site.

- **Greater Sage-Grouse**, a state threatened and federal candidate species, are closely tied to the distribution of big sagebrush within much of their range (WDFW, 2015a). Historically greater sage-grouse occurred throughout eastern Washington. However, currently, according to WDFW, Washington State has only two isolated breeding populations: one in Douglas and Grant Counties and one in Benton, Yakima, Kittitas, Grant, Lincoln and Okanogan Counties (WDFW, 2015a). Although greater sage-grouse were not identified during the site investigation, due to habitat characteristics of the project site (shrub-steppe habitat with big sagebrush), the greater sage-grouse could be found within the project site.
- **Washington ground squirrel**, a state and federal candidate species, is found in the Columbia Plateau, south of the Columbia River and east of the John Day River (USFWS, 2013). Historically the species was distributed over much of the shrub-steppe habitat of southeastern Washington but its range has been reduced due to habitat loss; primarily from agricultural development (USFWS, 2013). Currently the Washington population occurs in Adams, Douglas, Franklin, Grant, Lincoln and Walla Walla counties (USFWS, 2013). Typically the Washington ground squirrel is associated with sagebrush grasslands and occupies sites with sandy or silt-loam textured soils that can support its burrow structures (USFWS, 2013). Since Washington ground squirrels are known to be within Grant County, the site contains sagebrush grasslands, and numerous small mammal burrows were observed throughout the site, it is possible that the Washington ground squirrel is found within the project boundary.
- **Loggerhead shrike**, a state candidate species, are primarily a breeding resident of the shrub-steppe zone in eastern Washington (WDFW, 2013). According to the WDFW 2012 annual report, most loggerhead shrikes arrive in Washington mid to late March and migrate by September (WDFW, 2013). Loggerhead shrike use open habitat with scattered shrubs during both breeding and nonbreeding seasons (WDFW, 2013). Because these birds use shrub-steppe habitat and are known to be in eastern Washington, it is possible they may occur within the project site and potentially use the area for breeding.
- **Long-billed curlew**, a state priority habitat species, breed in eastern Washington in the central Columbia Basin and up through the Okanogan Valley (BirdWeb, 2015). Dry grasslands and shrub savannahs are traditional breeding habitats; however, they are also found in grain fields, pastures, coastal mudflats and marshes (BirdWeb, 2015). WDFW PHS data currently map long-billed curlew habitat within the project site (WDFW, 2015c). Therefore, it is possible long-billed curlew could be within the project area.
- **Merriam's shrew**, a state candidate species, is found east of the Cascades in Washington State and their range includes portions of central and southeastern Washington (WDFW, 2004b). Little research has been done, but the most common reported habitat for this species is sagebrush-steppe and

semiarid grasslands, and suitable habitat also appears to be associated with other small burrowing mammals (WDFW, 2013). Therefore, it is possible Merriam's shrew are within the project area.

- **Preble's shrew**, a state candidate species, is found in arid and semiarid shrub and grass associations in eastern Washington (NatureServe, 2015). Therefore, because there is suitable habitat within the project site, it is possible Preble's shrew are within the project area.
- **Black-tailed jackrabbit**, a state candidate species, occur primarily in sagebrush habitats with open grass (WDFW, 2013). It is the most common jackrabbit in the western United States (WDFW, 2013). Because there is suitable habitat within the project site, it is possible black-tailed jackrabbits are within the project area.
- **White-tailed jackrabbit**, a state candidate species, are most common in bunchgrass habitats with less shrub cover than the black-tailed jackrabbit (WDFW, 2013). In part of its historical range, where cultivation, drought or overgrazing has affected habitat, white-tailed jackrabbits have been replaced by black-tailed jackrabbits (WDFW, 2013). Because there is suitable habitat within the project site, it is possible white-tailed jackrabbits are within the project area.

4.2.2 Plants and Vegetation Communities

4.2.2.1 Federally Listed Species

The only federally listed plant species within Grant County is Ute ladies'-tresses (*Spiranthes diluvialis*). The federal candidate species within Grant County is Wormskiold's northern wormwood (*Artemisia campestris var. wormskiodii*), and species of concern include Wanapum crazyweed (*Oxytropis campestris var wanapum*) and persistent-sepal yellowcress (*Rorippa columbiae*).

The site does not contain suitable habitat for persistent-sepal yellowcress. However, the site contains suitable habitat for Wormskiold's northern wormwood and Wanapum crazyweed, which are found in shrub-steppe and grasslands. The likelihood of occurrence of these species within the project area is discussed in Section 4.2.2.4 (Key Plant Species Potential to Occur at the Site).

4.2.2.2 Washington State Listed Species

There are 15 state-listed threatened and endangered plant species found within Grant County. No candidate or species of concern species are expected to occur within the project area. State-listed plant species are identified below in Table 2. The likelihood of occurrence of these species within the project area is discussed in Section 4.2.2.4.

4.2.2.3 Washington Natural Heritage Program (WNHP)

The Washington State DNR lists 43 rare plant species that are known to occur in Grant County. A search of the DNR Natural Heritage Program (NHP) database revealed no records of any listed plants, high quality ecosystems, or other significant natural features on, or within, the vicinity of the project site. (DNR, 2014a). Although 43 rare plant species are known to occur in Grant County, the table below lists only the state and federally listed rare plant species (15 of the 43 rare species) that could potentially occur in the vicinity of the project.

TABLE 2. GRANT COUNTY FEDERAL AND STATE LISTED PLANTS

Common Name	Scientific Name	State Status	Federal Status	Habitat[1]	Potential to Occur on Site
Great Basin gilia	*Aliciella leptomeria*	T	–	Open semiarid habitat	Yes – suitable habitat
Grand redstem	*Ammannia robusta*	T	---	Shoreline and islands along Columbia River	No
Wormskiold's northern wormwood	*Artemisia campestris var. wormskioldii*	E	C	Shrub-steppe	Yes – suitable habitat
Palouse milk-vetch	*Astragalus arrectus*	T	---	Grassy hillsides, sagebrush flats, river bluffs	Yes – suitable habitat
Geyer's milk-vetch	*Astragalus geyeri var. geyeri*	T	---	Depressions in mobile or stabilized dunes, sandy flats and valley floors	No
White eatonella	*Eatonella nivea*	T	---	Shrub steppe	Yes – suitable habitat
Halfchaff awned sedge	*Lipocarpha aristulata*	T	---	Wet areas in bottomlands, sandbars, beaches, shorelines, stream banks, ponds and ditches	No
Red poverty-weed	*Micromonolepis pusilla*	T	---	Desert regions in saline or alkaline clay soils	No
Nuttall's sandwort	*Minuartia nuttallii var. fragilis*	T	---	Open gravelly benches, dry rocky areas or limestone talus from open sagebrush hills to alpine slopes	No
Wanapum crazyweed	*Oxytropis campestris var. wanapum*	E	SoC	Open grassland/ shrubland	Yes – suitable habitat
Fremont's combleaf	*Polyctenium fremontii*	T	---	Sagebrush deserts with gravelly clay, damp or wet meadows, shallow ponds, stony swales, dried vernal pools and banks of vernal streamlets	No
Austin's knotweed	*Polygonum austiniae*	T	---	Dry to moist flats or banks, from sagebrush plains to lower mountains, often with ponderosa pine.	Yes – suitable habitat
Persistent-sepal yellowcress	*Rorippa columbiae*	T	SoC	Riverbanks, permanent lakes, snow-fed lakes and streams, internally drained lakes with extended periods of dryness, wet meadows and ditches.	No

Common Name	Scientific Name	State Status	Federal Status	Habitat[1]	Potential to Occur on Site
Lowland toothcup	*Rotala ramosior*	T	---	Damp areas in fine sand and silt, wet swampy places, mudflats, lake and pond margins, and along free-flowing river reaches.	No
Ute ladies'-tresses*	*Spiranthes diluvialis*	E	T	Intermontane valley plains in moist meadows associated with perennial streams, floodplains and oxbows.	No

Note:

1. Plant habitat characteristics come from the Washington Natural Heritage Information System (2014b). Available online at: http://www1.dnr.wa.gov/nhp/refdesk/lists/plantsxco/grant.html

* Ute ladies'-tresses was not included in the Natural Heritage Program database, but is listed by USFWS to potentially occur in Grant County.

E = Endangered. In danger of becoming extinct or extirpated from Washington.

T = Threatened. Likely to become endangered in Washington.

C = Candidate Species. Sufficient information exists to support listing as Endangered or Threatened.

SoC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.

4.2.2.4 Key Plant Species Potential to Occur at the Site

Based on preferred habitat characteristics from the above table, the following species may be present within the project site: Great Basin gilia, Wormskiold's northern wormwood, Palouse milk-vetch, white eatonella, Nuttall's sandwort, and Wanapum crazyweed. These rare plant species typically occur in shrub-steppe and open grassland habitat areas (DNR, 2014b), both of which occur within the project site.

5.0 IMPACTS AND MITIGATION MEASURES FOR ALTERNATIVES

This section identifies and analyzes impacts to plants and animals on, and adjacent to, the project site. The project area and zoning would not change, regardless of the alternative. Impacts are expected to be similar for Alternatives 1 and 2. Where impacts would differ, they are noted in the descriptions below.

Alternative 1 is proposed to have heavy manufacturing (70 percent of development) with an emphasis on warehouses (30 percent development). Approximately 202 acres would be developed in new building area and there would be a total of approximately 1,084 acres of impervious surfaces as a result of this alternative.

Alternative 2 is proposed to have light manufacturing (70 percent of development) with an emphasis on technology (30 percent of development). Approximately 230 acres would be developed in new building area and there would be a total of approximately 1,007 acres of impervious surfaces as a result of this alternative. Alternative 2 would have less impervious surfaces, no heavy industrial businesses, less truck traffic, more building area, more employees, and more automobile traffic and associated noise than Alternative 1.

Both alternatives would increase noise levels; however, it is anticipated that noise associated with industrial, aircraft, and railroad operations would not result in impacts to noise-sensitive receivers in the site vicinity (Landau Associates, 2015). Noise associated with traffic would likely result in increased noise levels at the Columbia Basin Secondary School located on Randolph Road NE (Landau Associates, 2015). It is also expected that Alternative 1 would result in more habitat loss than Alternative 2 because there would be more impervious surfaces.

5.1 Alternatives 1 and 2

5.1.1 Surface Water

No surface water was identified within the project area that would be impacted by the proposed project. The closest surface water features to the site are Crab Creek and Moses Lake, which occur approximately 0.4 miles east and 1.5 miles west of the site, respectively. Stormwater runoff would likely be controlled with a stormwater pollution prevention plan (SWPPP) and through appropriate jurisdictional code (MLMC Title 13 and GCC Title 13 and Title 14). Therefore, no impacts to on- or off-site surface water features would occur for either Alternative 1 or Alternative 2.

5.1.1.1 Short-term Impacts

Since there are no surface waters within the project area, and the closest offsite feature is approximately 0.5 miles from the project site, there is likely no potential for discharge of construction stormwater during construction. Stormwater runoff would be controlled with a SWPPP and through appropriate jurisdictional code. Therefore, no short-term impacts to surface water would occur as a result of the project for either Alternative 1 or Alternative 2.

5.1.1.2 Long-term Impacts

Since there are no surface waters within the project area, there is likely no potential for discharge of stormwater off-site. Operational stormwater treatment would be required per Moses Lake and Grant County municipal code. There would be no long-term impacts to surface water as a result of the project for either Alternative 1 or Alternative 2.

5.1.1.3 Mitigation

Mitigation for surface water impacts is not proposed because no impacts have been identified. Stormwater runoff would likely be controlled with a SWPPP and through appropriate municipal code. In addition, operational requirements would likely include stormwater treatment.

5.1.2 Fish, Wildlife and Plants

Based on preferred and suitable habitat characteristics for the federal, state and locally-listed wildlife and plant species discussed above, the lists below include species that may be present within the project site. These animals and plants are typically associated with shrub-steppe and grassland habitats that are present within the approximately 1,200-acre project site.

Plant Species that Might be Present

- Great Basin gilia
- Wormskiold's northern wormwood
- Palouse milk-vetch, white eatonella
- Nuttall's sandwort
- Wanapum crazyweed

Wildlife Species that Might be Present

- Burrowing owls
- Greater sage-grouse
- Washington ground squirrel
- Loggerhead shrike
- Long-billed curlew
- Merriam's shrew
- Preble's shrew
- Black-tailed jackrabbit
- White-tailed jackrabbit

5.1.2.1 Short-term Impacts

Noise associated with construction activities may also result in short term avoidance of the project area by wildlife species. While small mammals would likely avoid construction areas, increased noise levels during construction are likely to temporarily disturb or alter migration patterns of larger mammals. Construction noise may temporarily disrupt feeding and migration and result in short-term avoidance by bird species. Increased noise levels during construction may temporarily disrupt foraging, nesting, calling and flight behavior of birds within the immediate vicinity of the project area. Urban-adapted birds are more tolerant of disturbance, but those that are habitat and territory specific may handle the displacement with difficulty when searching for suitable habitat in otherwise claimed territories. During breeding season, there is more of a potential for permanent loss of species. However, these potential construction impacts to wildlife would be temporary, highly localized and would cease once construction is complete.

5.1.2.2 Long-term Impacts

Long term impacts are, in general, going to result from loss of suitable habitat and operational activities within the project site including direct and indirect effects. Both alternatives would likely cause direct effects such as an increase in noise and human presence and a loss of shrub-steppe and grassland habitat. There might also be indirect effects, such as changing predator/prey relationships – for example if the project causes prey species (squirrels) to avoid the project site, then predator species (owls, hawks, etc.) might avoid the project site. These changes have the potential to impact plant and wildlife species that could be present within the project area.

Development would result in a loss of suitable habitat for numerous plant and wildlife species. The rare plants listed above are only found in habitats similar to the project area (shrub-steppe and grasslands). Reduction in suitable habitat may result in the loss of individual plants of these species. Wildlife that are territory-specific may handle the displacement with difficulty when searching for suitable habitat in otherwise claimed territories and potentially result in permanent loss of individuals of these species. In addition, development may result in a loss of breeding habitat within the project area. During breeding season, there is a higher potential for permanent loss of these species.

During operational phases of the project it is expected that both alternatives would have louder noise levels associated with them because additional automobiles and trucks will travel through the site on a daily basis. In addition to noise, development of new aviation and manufacturing uses within areas that are not currently developed would increase lights and human presence within the area. These operational effects would likely cause wildlife species to avoid the area. Avoidance has the potential for causing permanent loss of species, especially if the area is used for breeding and nesting.

Alternative 2 would have more building area but less impervious surface areas than Alternative 1. However, both alternatives would cause loss of suitable habitat for plants and wildlife and may impact the presence of these species in the area. Therefore, both alternatives have the potential to permanently impact plant and wildlife numbers within the project site. Before individual projects start, plant and wildlife surveys should be conducted as required by local and state authorities to determine if any of these rare plant species or listed wildlife species occur within the specific project site at the time of development applications.

5.1.2.3 Mitigation

In order to reduce impacts from the proposed project, mitigation actions may be required. Once project designs have been finalized, minimization measures and specific mitigation actions would be identified. However, some measures could include, but are not limited to:

- Permits for development would be subject to Grant County and City of Moses Lake regulations at the time of permit issuance. Additional site specific critical area studies may be required to evaluate potential impacts and identify required mitigation.
- Construction best management practices (BMPs) would be employed to avoid and minimize impacts from construction activities.
- Burrowing owl nesting surveys should be conducted to determine the presence of this species within the specific proposed project location at the time of development applications.
- Work would be restricted within 0.5 mile of active burrowing owl nests.
- Plant surveys should be conducted to determine the presence of the rare plant species within the specific project area at the time of development applications.
- Landscaping would be included in future projects and would meet or exceed Grant County and City of Moses Lake landscaping requirements. If native plant species are used, this would serve to replace a portion of the habitat for wildlife species within the project area.
- If impacts to priority plant and wildlife species are unavoidable, appropriate mitigation would be implemented as needed. Currently there is a burrowing owl mitigation site that was constructed for another project within the vicinity of the site (URS, 2010). Appropriate mitigation for burrowing owls could include expanding this mitigation area or identify another appropriate mitigation area.
- Specific project designs would be developed in accordance with species management recommendations from WDFW, Grant County, the City of Moses Lake, and the Port of Moses Lake for species that are determined to be at the project site.
- Native vegetation would be preserved where possible.

5.2 No Action Alternative

The No Action Alternative would result in no development of the project site at this time, and thus no new impacts to plants or animals. Potential impacts to plants and animals from an alternate future development of the project site under current zoning regulations is unknown.

5.3 Cumulative Impacts

Cumulative impacts are not expected because future projects would need to meet City of Moses Lake, Grant County and Port of Moses Lake permitting requirements, similar to the proposed project.

5.4 Significant Unavoidable Adverse Impacts

Project development under both Alternatives 1 and 2 would result in the permanent loss of suitable habitat for sagebrush steppe dependent species and, potentially, the loss of occupied habitat and individuals within the population, if present during construction. However, with implementation of pre-construction species surveys and avoidance and mitigation measures as required by local, state and federal resource agencies, no significant impacts are expected.

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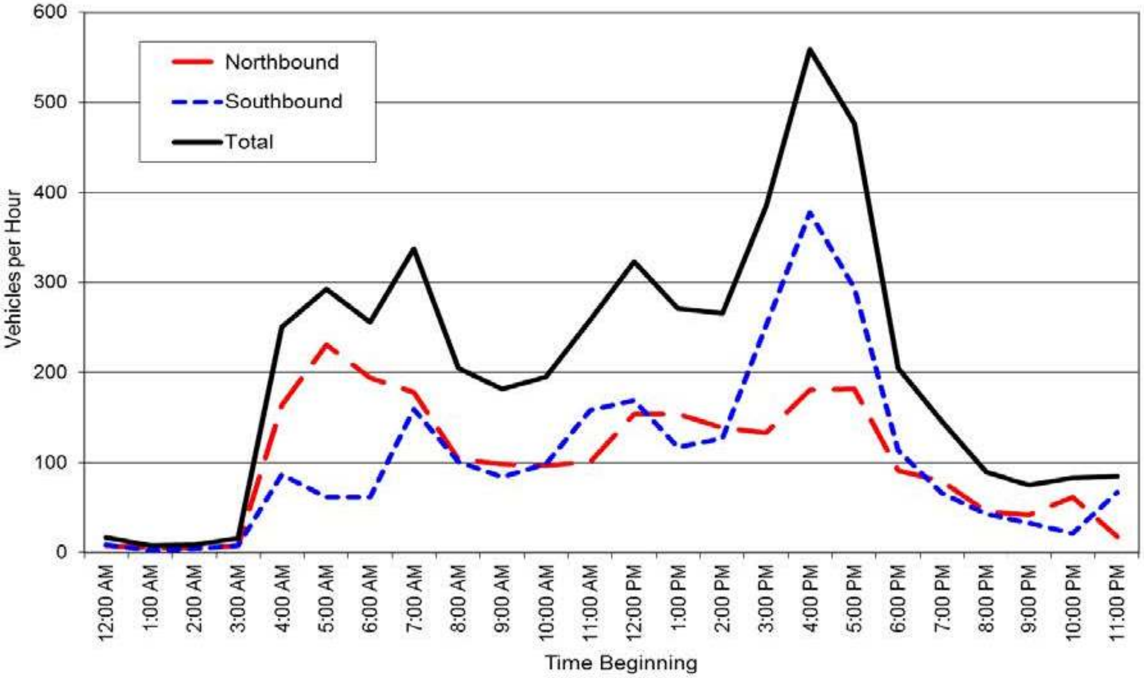
Appendix C

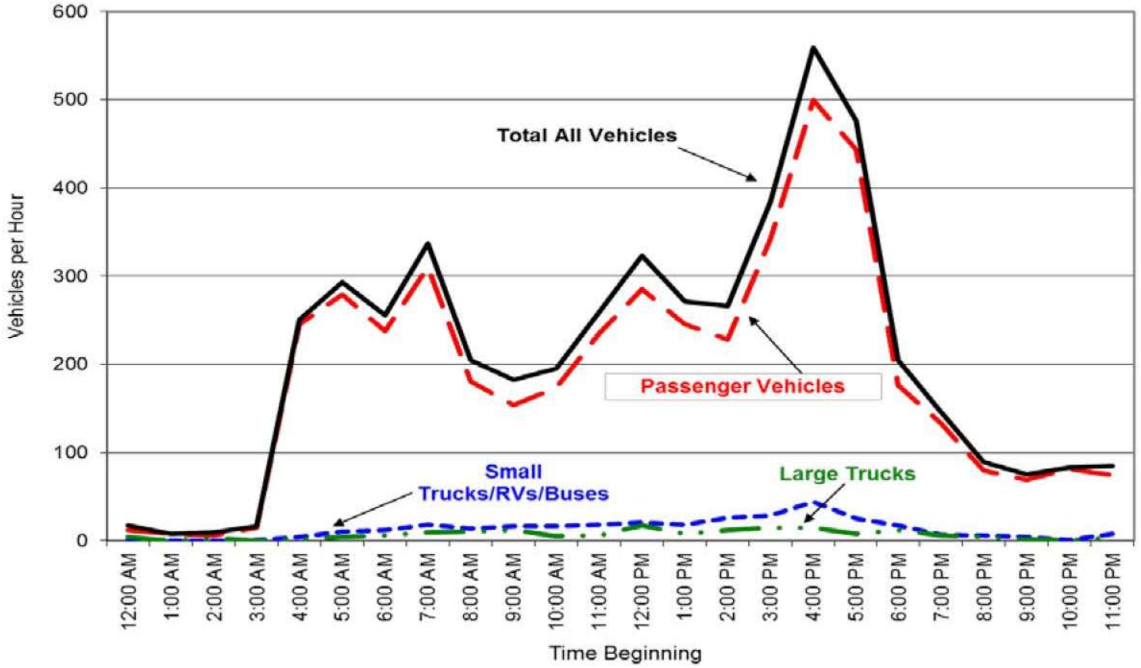
Transportation Tables and Figures

Figure 1 - Stratford Road NE - Weekday Traffic Volumes by Time of Day



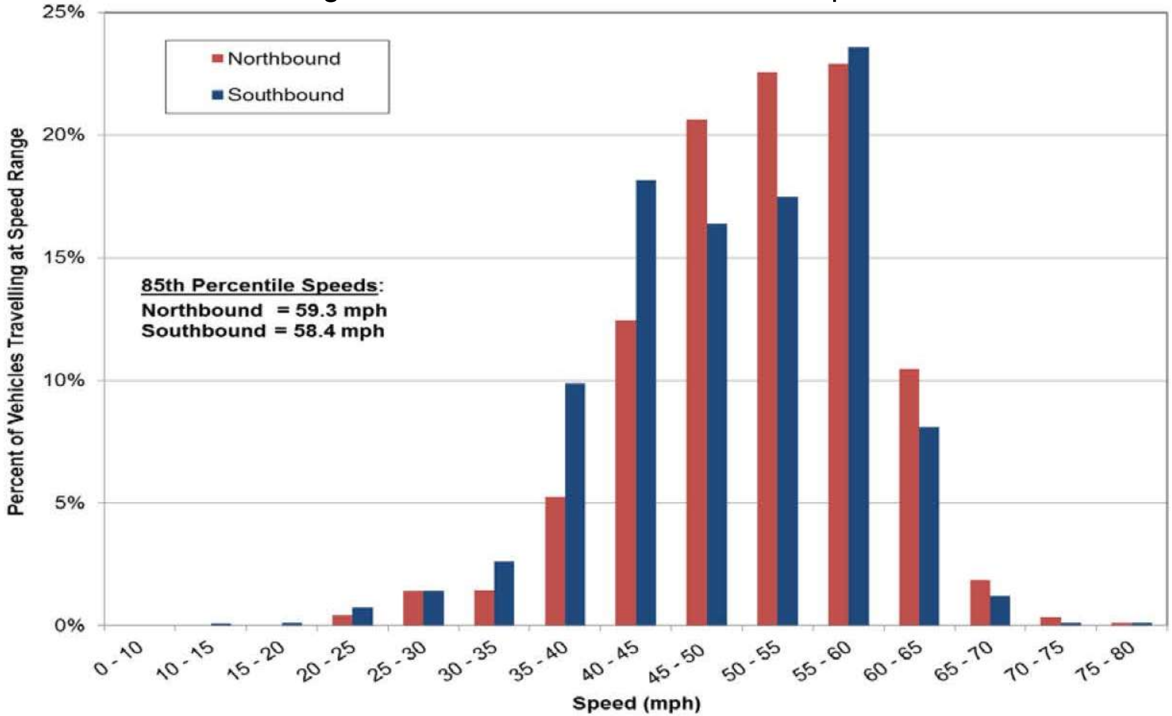
Source: Machine count by IDAX Data Solutions, Tuesday, March 10, 2015. Counts were performed on Stratford Road NE just south of Road 7 NE.

Figure 2 - Stratford Road NE - Hourly Traffic Volumes by Type of Vehicle



Source: Machine count by IDAX Data Solutions, Tuesday, March 10, 2015. Counts were performed on Stratford Road NE just south of Road 7 NE.

Figure 3 - Stratford Road NE Travel Speeds



Source: Machine speed survey by IDAX Data Solutions, Tuesday, March 10, 2015. Data collected on Stratford Road NE just south of Road 7 NE.

Table 1 - Collision Summary

Intersection	Collision Type: Head-On	Rear-End	Side-Swipe	Right Turn	Left Turn	Right Angle	Ped/ Cycle	Other [1]	Total for 4 Years	Avg/ Year	Rate per MEV [2]
Randolph Rd NE/ SR 17	0	1	0	0	0	3	0	1	5	1.3	0.31
Randolph Rd NE/ Patton Blvd NE	0	0	0	0	0	10	0	0	10	2.5	1.37
Rd 7 NE/ Stratford Rd NE – Rd J NE	0	2	0	4	1	6	0	1	14	3.5	1.31
Tyndall Rd NE/ Stratford Rd NE – Rd J NE	0	0	0	0	0	0	0	0	0	0.0	0.0
Roadway Segment	**Collision Type: Head-On**	**Rear-End**	**Side-Swipe**	**Right Turn**	**Left Turn**	**Right Angle**	**Ped/ Cycle**	**Other [1]**	**Total for 4 Years**	**Avg/ Year**	**Rate per MVM [3]**
SR 17, Randolph Rd NE - Airway Dr NE	1	2	1	0	0	0	0	7	11	2.8	0.5
SR 17, Airway Dr NE - Patton Blvd NE	0	0	1	0	0	0	0	0	2	0.5	0.2
Stratford Rd NE, ¼ mile north of Tyndall Rd NE	0	0	0	0	0	0	0	1	1	0.3	1.7
Stratford Rd NE, Tyndall Rd NE – Rd 7 NE	0	0	0	0	0	0	0	3	3	0.8	1.9
Stratford Rd NE, ¼ mile south of Rd 7 NE	0	0	0	0	0	0	0	0	0	0.0	0.0

Source: Washington State Department of Transportation, March 2015; compiled by Heffron Transportation, March 2015.

1 *Other includes improper movement, hitting object, or veering into the roadway ditch.*

2. *MEV = million entering vehicles, calculated at study area intersections where collisions have been reported.*

3. *MVM = million vehicle miles traveled.*

Vehicle Classification Report Summary

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE

Count Direction: Northbound / Southbound

Date Range: 3/10/2015 to 3/11/2015

Site Code: 01

	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Study Total														
Northbound	21	1,350	1,016	38	44	27	3	7	35	0	0	0	27	2,568
Percent	0.8%	52.6%	39.6%	1.5%	1.7%	1.1%	0.1%	0.3%	1.4%	0.0%	0.0%	0.0%	1.1%	100%
Southbound	23	1,606	713	15	16	175	14	46	23	4	4	0	32	2,671
Percent	0.9%	60.1%	26.7%	0.6%	0.6%	6.6%	0.5%	1.7%	0.9%	0.1%	0.1%	0.0%	1.2%	100%
Total	44	2,956	1,729	53	60	202	17	53	58	4	4	0	59	5,239
Percent	0.8%	56.4%	33.0%	1.0%	1.1%	3.9%	0.3%	1.0%	1.1%	0.1%	0.1%	0.0%	1.1%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

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Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

DATA SOLUTIONS

Tuesday, March 10, 2015
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 AM	1	48	42	1	3	4	1	0	1	0	0	0	0	**101**
12:00 PM	1	60	73	2	5	4	0	1	3	0	0	0	5	**154**
1:00 PM	1	76	68	1	2	4	0	0	1	0	0	0	1	**154**
2:00 PM	5	68	54	4	4	3	0	0	0	0	0	0	1	**139**
3:00 PM	1	63	60	2	3	1	0	1	0	0	0	0	2	**133**
4:00 PM	1	111	57	2	2	2	0	2	2	0	0	0	2	**181**
5:00 PM	2	111	65	1	0	1	0	0	1	0	0	0	1	**182**
6:00 PM	3	49	35	2	1	0	0	0	0	0	0	0	1	**91**
7:00 PM	1	43	33	0	0	0	0	0	1	0	0	0	2	**80**
8:00 PM	0	22	20	0	1	0	1	0	1	0	0	0	1	**46**
9:00 PM	1	20	18	0	2	0	0	0	0	0	0	0	1	**42**
10:00 PM	0	44	17	0	0	0	0	0	1	0	0	0	0	**62**
11:00 PM	0	12	5	0	0	0	0	0	0	0	0	0	1	**18**
Total	**17**	**727**	**547**	**15**	**23**	**19**	**2**	**4**	**11**	**0**	**0**	**0**	**18**	**1,383**
Percent	**1.2%**	**52.6%**	**39.6%**	**1.1%**	**1.7%**	**1.4%**	**0.1%**	**0.3%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	

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Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

Tuesday, March 10, 2015
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 AM	0	90	54	0	1	8	0	1	1	0	1	0	2	**158**
12:00 PM	1	93	57	0	1	9	0	2	4	1	0	0	1	**169**
1:00 PM	0	54	46	0	0	10	1	1	1	0	1	0	3	**117**
2:00 PM	0	65	36	2	3	9	1	5	2	0	0	0	4	**127**
3:00 PM	4	166	48	1	0	20	1	8	0	1	1	0	2	**252**
4:00 PM	2	230	99	1	3	34	0	5	0	1	0	0	3	**378**
5:00 PM	5	199	61	0	0	22	1	3	1	0	0	0	2	**294**
6:00 PM	3	66	20	0	0	13	1	9	0	0	1	0	1	**114**
7:00 PM	1	48	7	0	0	6	1	2	0	0	0	0	1	**66**
8:00 PM	1	27	9	0	0	2	2	0	0	0	0	0	2	**43**
9:00 PM	0	21	9	0	0	2	0	0	1	0	0	0	0	**33**
10:00 PM	0	19	1	0	0	1	0	0	0	0	0	0	0	**21**
11:00 PM	1	49	7	0	0	6	2	2	0	0	0	0	0	**67**
Total	**18**	**1,127**	**454**	**4**	**8**	**142**	**10**	**38**	**10**	**3**	**4**	**0**	**21**	**1,839**
Percent	**1.0%**	**61.3%**	**24.7%**	**0.2%**	**0.4%**	**7.7%**	**0.5%**	**2.1%**	**0.5%**	**0.2%**	**0.2%**	**0.0%**	**1.1%**	

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

Wednesday, March 11, 2015
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	4	0	0	0	0	0	0	2	0	0	0	2	**8**
1:00 AM	0	4	1	0	0	0	0	0	0	0	0	0	0	**5**
2:00 AM	0	1	2	0	0	0	0	0	1	0	0	0	1	**5**
3:00 AM	0	5	3	0	0	0	0	0	0	0	0	0	0	**8**
4:00 AM	1	100	61	0	1	0	0	0	1	0	0	0	0	**164**
5:00 AM	2	134	90	1	1	1	0	0	2	0	0	0	0	**231**
6:00 AM	0	110	74	5	2	0	0	0	3	0	0	0	0	**194**
7:00 AM	1	98	66	3	2	2	1	0	3	0	0	0	2	**178**
8:00 AM	0	63	34	2	0	2	0	1	2	0	0	0	0	**104**
9:00 AM	0	36	44	4	5	1	0	1	6	0	0	0	1	**98**
10:00 AM	0	32	51	6	3	1	0	0	2	0	0	0	2	**97**
11:00 AM	0	33	42	2	7	1	0	1	2	0	0	0	1	**89**
12:00 PM	0	3	1	0	0	0	0	0	0	0	0	0	0	**4**
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**4**	**623**	**469**	**23**	**21**	**8**	**1**	**3**	**24**	**0**	**0**	**0**	**9**	**1,185**
Percent	**0.3%**	**52.6%**	**39.6%**	**1.9%**	**1.8%**	**0.7%**	**0.1%**	**0.3%**	**2.0%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

Wednesday, March 11, 2015
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	4	4	0	0	1	0	0	0	0	0	0	0	**9**
1:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	**3**
2:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	1	**4**
3:00 AM	0	3	4	0	0	1	0	0	0	0	0	0	0	**8**
4:00 AM	0	66	17	0	0	3	0	0	0	0	0	0	1	**87**
5:00 AM	1	33	19	0	0	7	0	0	1	0	0	0	1	**62**
6:00 AM	0	41	13	1	1	1	2	0	1	0	0	0	2	**62**
7:00 AM	1	97	47	2	3	5	0	2	1	0	0	0	1	**159**
8:00 AM	0	54	30	3	1	5	1	1	4	0	0	0	2	**101**
9:00 AM	0	39	35	3	1	2	0	1	1	1	0	0	1	**84**
10:00 AM	3	47	41	1	0	5	0	0	1	0	0	0	0	**98**
11:00 AM	0	86	49	1	2	3	1	4	4	0	0	0	2	**152**
12:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	**3**
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**5**	**479**	**259**	**11**	**8**	**33**	**4**	**8**	**13**	**1**	**0**	**0**	**11**	**832**
Percent	**0.6%**	**57.6%**	**31.1%**	**1.3%**	**1.0%**	**4.0%**	**0.5%**	**1.0%**	**1.6%**	**0.1%**	**0.0%**	**0.0%**	**1.3%**	

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

idax DATA SOLUTIONS

Total Study Average
Northbound

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	0	2	0	0	0	0	0	0	1	0	0	0	1	**4**
1:00 AM	0	2	1	0	0	0	0	0	0	0	0	0	0	**3**
2:00 AM	0	1	1	0	0	0	0	0	1	0	0	0	1	**4**
3:00 AM	0	3	2	0	0	0	0	0	0	0	0	0	0	**5**
4:00 AM	1	50	31	0	1	0	0	0	1	0	0	0	0	**84**
5:00 AM	1	67	45	1	1	1	0	0	1	0	0	0	0	**117**
6:00 AM	0	55	37	3	1	0	0	0	2	0	0	0	0	**98**
7:00 AM	1	49	33	2	1	1	1	0	2	0	0	0	1	**91**
8:00 AM	0	32	17	1	0	1	0	1	1	0	0	0	0	**53**
9:00 AM	0	18	22	2	3	1	0	1	3	0	0	0	1	**51**
10:00 AM	0	16	26	3	2	1	0	0	1	0	0	0	1	**50**
11:00 AM	1	41	42	2	5	3	1	1	2	0	0	0	1	**99**
12:00 PM	1	32	37	1	3	2	0	1	2	0	0	0	3	**82**
1:00 PM	1	38	34	1	1	2	0	0	1	0	0	0	1	**79**
2:00 PM	3	34	27	2	2	2	0	0	0	0	0	0	1	**71**
3:00 PM	1	32	30	1	2	1	0	1	0	0	0	0	1	**69**
4:00 PM	1	56	29	1	1	1	0	1	1	0	0	0	1	**92**
5:00 PM	1	56	33	1	0	1	0	0	1	0	0	0	1	**94**
6:00 PM	2	25	18	1	1	0	0	0	0	0	0	0	1	**48**
7:00 PM	1	22	17	0	0	0	0	0	1	0	0	0	1	**42**
8:00 PM	0	11	10	0	1	0	1	0	1	0	0	0	1	**25**
9:00 PM	1	10	9	0	1	0	0	0	0	0	0	0	1	**22**
10:00 PM	0	22	9	0	0	0	0	0	1	0	0	0	0	**32**
11:00 PM	0	6	3	0	0	0	0	0	0	0	0	0	1	**10**
Total	**16**	**680**	**513**	**22**	**26**	**17**	**3**	**6**	**23**	**0**	**0**	**0**	**19**	**1,325**
Percent	**1.2%**	**51.3%**	**38.7%**	**1.7%**	**2.0%**	**1.3%**	**0.2%**	**0.5%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	

Note: Average only condsidered on days with 24-hours of data.

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Location: **STRATFORD RD (ROAD J NE) S/O ROAD 7 NE**
Date Range: **3/10/2015 to 3/11/2015**
Site Code: **01**

Total Study Average
Southbound

Time	FHWA Vehicle Classification 1	2	3	4	5	6	7	8	9	10	11	12	13	Total Volume
12:00 AM	0	2	2	0	0	1	0	0	0	0	0	0	0	**5**
1:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	**2**
2:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	1	**3**
3:00 AM	0	2	2	0	0	1	0	0	0	0	0	0	0	**5**
4:00 AM	0	33	9	0	0	2	0	0	0	0	0	0	1	**45**
5:00 AM	1	17	10	0	0	4	0	0	1	0	0	0	1	**34**
6:00 AM	0	21	7	1	1	1	1	0	1	0	0	0	1	**34**
7:00 AM	1	49	24	1	2	3	0	1	1	0	0	0	1	**83**
8:00 AM	0	27	15	2	1	3	1	1	2	0	0	0	1	**53**
9:00 AM	0	20	18	2	1	1	0	1	1	1	0	0	1	**46**
10:00 AM	2	24	21	1	0	3	0	0	1	0	0	0	0	**52**
11:00 AM	0	88	52	1	2	6	1	3	3	0	1	0	2	**159**
12:00 PM	1	48	29	0	1	5	0	1	2	1	0	0	1	**89**
1:00 PM	0	27	23	0	0	5	1	1	1	0	1	0	2	**61**
2:00 PM	0	33	18	1	2	5	1	3	1	0	0	0	2	**66**
3:00 PM	2	83	24	1	0	10	1	4	0	1	1	0	1	**128**
4:00 PM	1	115	50	1	2	17	0	3	0	1	0	0	2	**192**
5:00 PM	3	100	31	0	0	11	1	2	1	0	0	0	1	**150**
6:00 PM	2	33	10	0	0	7	1	5	0	0	1	0	1	**60**
7:00 PM	1	24	4	0	0	3	1	1	0	0	0	0	1	**35**
8:00 PM	1	14	5	0	0	1	1	0	0	0	0	0	1	**23**
9:00 PM	0	11	5	0	0	1	0	0	1	0	0	0	0	**18**
10:00 PM	0	10	1	0	0	1	0	0	0	0	0	0	0	**12**
11:00 PM	1	25	4	0	0	3	1	1	0	0	0	0	0	**35**
Total	**16**	**810**	**364**	**11**	**12**	**94**	**11**	**27**	**16**	**4**	**4**	**0**	**21**	**1,390**
Percent	**1.2%**	**58.3%**	**26.2%**	**0.8%**	**0.9%**	**6.8%**	**0.8%**	**1.9%**	**1.2%**	**0.3%**	**0.3%**	**0.0%**	**1.5%**	

Note: Average only condsidered on days with 24-hours of data.

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

3-Day (Tuesday - Thursday) Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 AM	1	48	42	1	3	4	1	0	1	0	0	0	0	**101**
12:00 PM	1	60	73	2	5	4	0	1	3	0	0	0	5	**154**
1:00 PM	1	76	68	1	2	4	0	0	1	0	0	0	1	**154**
2:00 PM	5	68	54	4	4	3	0	0	0	0	0	0	1	**139**
3:00 PM	1	63	60	2	3	1	0	1	0	0	0	0	2	**133**
4:00 PM	1	111	57	2	2	2	0	2	2	0	0	0	2	**181**
5:00 PM	2	111	65	1	0	1	0	0	1	0	0	0	1	**182**
6:00 PM	3	49	35	2	1	0	0	0	0	0	0	0	1	**91**
7:00 PM	1	43	33	0	0	0	0	0	1	0	0	0	2	**80**
8:00 PM	0	22	20	0	1	0	1	0	1	0	0	0	1	**46**
9:00 PM	1	20	18	0	2	0	0	0	0	0	0	0	1	**42**
10:00 PM	0	44	17	0	0	0	0	0	1	0	0	0	0	**62**
11:00 PM	0	12	5	0	0	0	0	0	0	0	0	0	1	**18**
Total	**17**	**727**	**547**	**15**	**23**	**19**	**2**	**4**	**11**	**0**	**0**	**0**	**18**	**1,383**
Percent	**1.2%**	**52.6%**	**39.6%**	**1.1%**	**1.7%**	**1.4%**	**0.1%**	**0.3%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

IDAX DATA SOLUTIONS

3-Day (Tuesday - Thursday) Average
Southbound

	FHWA Vehicle Classification													Total
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 AM	0	90	54	0	1	8	0	1	1	0	1	0	2	**158**
12:00 PM	1	93	57	0	1	9	0	2	4	1	0	0	1	**169**
1:00 PM	0	54	46	0	0	10	1	1	1	0	1	0	3	**117**
2:00 PM	0	65	36	2	3	9	1	5	2	0	0	0	4	**127**
3:00 PM	4	166	48	1	0	20	1	8	0	1	1	0	2	**252**
4:00 PM	2	230	99	1	3	34	0	5	0	1	0	0	3	**378**
5:00 PM	5	199	61	0	0	22	1	3	1	0	0	0	2	**294**
6:00 PM	3	66	20	0	0	13	1	9	0	0	1	0	1	**114**
7:00 PM	1	48	7	0	0	6	1	2	0	0	0	0	1	**66**
8:00 PM	1	27	9	0	0	2	2	0	0	0	0	0	2	**43**
9:00 PM	0	21	9	0	0	2	0	0	1	0	0	0	0	**33**
10:00 PM	0	19	1	0	0	1	0	0	0	0	0	0	0	**21**
11:00 PM	1	49	7	0	0	6	2	2	0	0	0	0	0	**67**
Total	**18**	**1,127**	**454**	**4**	**8**	**142**	**10**	**38**	**10**	**3**	**4**	**0**	**21**	**1,839**
Percent	**1.0%**	**61.3%**	**24.7%**	**0.2%**	**0.4%**	**7.7%**	**0.5%**	**2.1%**	**0.5%**	**0.2%**	**0.2%**	**0.0%**	**1.1%**	

Vehicle Speed Report Summary

DATA SOLUTIONS

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE

Count Direction: Northbound / Southbound

Date Range: 3/10/2015 to 3/11/2015

Site Code: 01

	Speed Range (mph)																	Total
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
Study Total																		
Northbound	0	1	1	11	36	37	135	320	530	580	588	269	48	9	3	0	0	2,568
Percent	0.0%	0.0%	0.0%	0.4%	1.4%	1.4%	5.3%	12.5%	20.6%	22.6%	22.9%	10.5%	1.9%	0.4%	0.1%	0.0%	0.0%	100%
Southbound	0	2	3	20	38	70	264	485	438	467	630	216	32	3	3	0	0	2,671
Percent	0.0%	0.1%	0.1%	0.7%	1.4%	2.6%	9.9%	18.2%	16.4%	17.5%	23.6%	8.1%	1.2%	0.1%	0.1%	0.0%	0.0%	100%
Total	0	3	4	31	74	107	399	805	968	1,047	1,218	485	80	12	6	0	0	5,239
Percent	0.0%	0.1%	0.1%	0.6%	1.4%	2.0%	7.6%	15.4%	18.5%	20.0%	23.2%	9.3%	1.5%	0.2%	0.1%	0.0%	0.0%	100%

Total Study Percentile Speed Summary			Total Study Speed Statistics		
Northbound			**Northbound**		
50th Percentile (Median)	51.9	mph	Mean (Average) Speed	51.2	mph
85th Percentile	59.3	mph	10 mph Pace	48.1 - 58.1	mph
95th Percentile	62.9	mph	Percent in Pace	46.8	%
Southbound			**Southbound**		
50th Percentile (Median)	50.1	mph	Mean (Average) Speed	49.4	mph
85th Percentile	58.4	mph	10 mph Pace	50.6 - 60.6	mph
95th Percentile	61.7	mph	Percent in Pace	41.5	%

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Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

IDAX DATA SOLUTIONS

Tuesday, March 10, 2015
Northbound

Time	Speed Range (mph)																	Total
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 AM	0	1	1	1	6	2	6	11	27	20	20	4	2	0	0	0	0	**101**
12:00 PM	0	0	0	2	5	1	3	18	23	34	39	23	5	1	0	0	0	**154**
1:00 PM	0	0	0	1	0	3	5	14	34	22	49	26	0	0	0	0	0	**154**
2:00 PM	0	0	0	0	2	1	6	13	22	29	32	21	9	3	1	0	0	**139**
3:00 PM	0	0	0	0	2	5	10	9	25	34	34	14	0	0	0	0	0	**133**
4:00 PM	0	0	0	0	2	2	8	16	47	50	34	21	1	0	0	0	0	**181**
5:00 PM	0	0	0	0	4	2	10	34	38	38	38	16	2	0	0	0	0	**182**
6:00 PM	0	0	0	1	2	0	1	9	11	22	20	21	4	0	0	0	0	**91**
7:00 PM	0	0	0	0	2	0	6	11	16	18	16	9	1	1	0	0	0	**80**
8:00 PM	0	0	0	0	1	1	2	5	7	14	9	5	2	0	0	0	0	**46**
9:00 PM	0	0	0	0	2	0	1	4	4	9	10	6	5	1	0	0	0	**42**
10:00 PM	0	0	0	0	0	1	1	1	3	9	30	16	1	0	0	0	0	**62**
11:00 PM	0	0	0	1	0	0	2	4	2	5	2	2	0	0	0	0	0	**18**
Total	**0**	**1**	**1**	**6**	**28**	**18**	**61**	**149**	**259**	**304**	**333**	**184**	**32**	**6**	**1**	**0**	**0**	**1,383**
Percent	**0.0%**	**0.1%**	**0.1%**	**0.4%**	**2.0%**	**1.3%**	**4.4%**	**10.8%**	**18.7%**	**22.0%**	**24.1%**	**13.3%**	**2.3%**	**0.4%**	**0.1%**	**0.0%**	**0.0%**	

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	52.8	mph	Mean (Average) Speed	51.8	mph
85th Percentile	60.2	mph	10 mph Pace	51.0 - 61.0	mph
95th Percentile	63.3	mph	Percent in Pace	46.9	%

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

IDAX DATA SOLUTIONS

Tuesday, March 10, 2015
Southbound

Time	Speed Range (mph)																	Total
Time	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 AM	0	1	3	10	4	9	9	21	19	26	37	17	0	1	1	0	0	**158**
12:00 PM	0	0	0	0	3	6	13	16	25	28	50	25	2	1	0	0	0	**169**
1:00 PM	0	0	0	1	5	6	5	21	18	21	28	9	3	0	0	0	0	**117**
2:00 PM	0	0	0	3	4	8	12	17	7	20	30	19	7	0	0	0	0	**127**
3:00 PM	0	0	0	1	1	1	15	48	48	32	80	22	4	0	0	0	0	**252**
4:00 PM	0	0	0	0	0	3	53	98	87	51	64	17	4	0	1	0	0	**378**
5:00 PM	0	0	0	1	0	4	30	54	47	68	68	20	2	0	0	0	0	**294**
6:00 PM	0	0	0	0	0	1	11	22	12	26	30	11	1	0	0	0	0	**114**
7:00 PM	0	0	0	0	2	3	6	8	10	12	18	6	1	0	0	0	0	**66**
8:00 PM	0	1	0	0	0	3	6	9	6	5	7	5	0	1	0	0	0	**43**
9:00 PM	0	0	0	1	3	1	5	1	12	5	3	2	0	0	0	0	0	**33**
10:00 PM	0	0	0	0	0	0	0	1	5	11	3	1	0	0	0	0	0	**21**
11:00 PM	0	0	0	0	0	0	4	12	5	10	26	8	2	0	0	0	0	**67**
Total	**0**	**2**	**3**	**17**	**22**	**45**	**169**	**328**	**301**	**315**	**444**	**162**	**26**	**3**	**2**	**0**	**0**	**1,839**
Percent	**0.0%**	**0.1%**	**0.2%**	**0.9%**	**1.2%**	**2.4%**	**9.2%**	**17.8%**	**16.4%**	**17.1%**	**24.1%**	**8.8%**	**1.4%**	**0.2%**	**0.1%**	**0.0%**	**0.0%**	

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	50.3	mph	Mean (Average) Speed	49.7	mph
85th Percentile	58.8	mph	10 mph Pace	50.6 - 60.6	mph
95th Percentile	62.2	mph	Percent in Pace	41.9	%

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

idax DATA SOLUTIONS

Wednesday, March 11, 2015
Northbound

Time	Speed Range (mph) 0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Total Volume
12:00 AM	0	0	0	1	1	1	0	1	1	1	2	0	0	0	0	0	0	**8**
1:00 AM	0	0	0	0	0	0	0	1	0	1	2	1	0	0	0	0	0	**5**
2:00 AM	0	0	0	0	0	0	1	0	1	2	0	0	1	0	0	0	0	**5**
3:00 AM	0	0	0	0	0	0	0	1	3	1	2	1	0	0	0	0	0	**8**
4:00 AM	0	0	0	0	0	0	9	23	68	43	15	5	0	1	0	0	0	**164**
5:00 AM	0	0	0	0	0	4	21	52	53	53	40	7	1	0	0	0	0	**231**
6:00 AM	0	0	0	0	0	1	1	15	28	57	64	26	1	0	1	0	0	**194**
7:00 AM	0	0	0	0	3	5	9	22	35	37	53	12	2	0	0	0	0	**178**
8:00 AM	0	0	0	1	0	2	7	13	22	21	30	7	1	0	0	0	0	**104**
9:00 AM	0	0	0	3	1	2	12	19	20	19	14	6	2	0	0	0	0	**98**
10:00 AM	0	0	0	0	2	4	9	12	18	19	17	13	2	0	1	0	0	**97**
11:00 AM	0	0	0	0	1	0	5	12	21	21	16	6	5	2	0	0	0	**89**
12:00 PM	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	**4**
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**5**	**8**	**19**	**74**	**171**	**271**	**276**	**255**	**85**	**16**	**3**	**2**	**0**	**0**	**1,185**
Percent	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.7%**	**1.6%**	**6.2%**	**14.4%**	**22.9%**	**23.3%**	**21.5%**	**7.2%**	**1.4%**	**0.3%**	**0.2%**	**0.0%**	**0.0%**	

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	50.8	mph	Mean (Average) Speed	50.4	mph
85th Percentile	58.2	mph	10 mph Pace	47.2 - 57.2	mph
95th Percentile	62.0	mph	Percent in Pace	49.1	%

Mark Skaggs:425-250-0777
mark.skaggs@idaxdata.com

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

DATA SOLUTIONS

Wednesday, March 11, 2015
Southbound

Time	Speed Range (mph) 0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Total Volume
12:00 AM	0	0	0	0	0	0	0	2	0	5	2	0	0	0	0	0	0	**9**
1:00 AM	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	**3**
2:00 AM	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	**4**
3:00 AM	0	0	0	0	0	1	3	1	2	0	1	0	0	0	0	0	0	**8**
4:00 AM	0	0	0	0	0	2	19	41	18	4	2	1	0	0	0	0	0	**87**
5:00 AM	0	0	0	1	2	3	22	13	8	6	6	1	0	0	0	0	0	**62**
6:00 AM	0	0	0	0	2	1	2	6	6	10	31	4	0	0	0	0	0	**62**
7:00 AM	0	0	0	0	1	3	10	23	42	36	35	8	1	0	0	0	0	**159**
8:00 AM	0	0	0	1	1	2	8	23	15	19	29	3	0	0	0	0	0	**101**
9:00 AM	0	0	0	0	4	5	6	18	10	14	14	10	2	0	1	0	0	**84**
10:00 AM	0	0	0	1	3	3	12	15	14	23	20	7	0	0	0	0	0	**98**
11:00 AM	0	0	0	0	3	5	10	15	22	31	46	18	2	0	0	0	0	**152**
12:00 PM	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	**3**
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**3**	**16**	**25**	**95**	**157**	**137**	**152**	**186**	**54**	**6**	**0**	**1**	**0**	**0**	**832**
Percent	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**1.9%**	**3.0%**	**11.4%**	**18.9%**	**16.5%**	**18.3%**	**22.4%**	**6.5%**	**0.7%**	**0.0%**	**0.1%**	**0.0%**	**0.0%**	

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	49.2	mph	Mean (Average) Speed	48.7	mph
85th Percentile	57.5	mph	10 mph Pace	48.5 - 58.5	mph
95th Percentile	60.6	mph	Percent in Pace	41.8	%

Mark Skaggs:425-250-0777
mark.skaggs@idaxdata.com

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

Total Study Average
Northbound

Time	Speed Range (mph)																	Total
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
12:00 AM	0	0	0	1	1	1	0	1	1	1	1	0	0	0	0	0	0	**7**
1:00 AM	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	**4**
2:00 AM	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	**4**
3:00 AM	0	0	0	0	0	0	0	1	2	1	1	1	0	0	0	0	0	**6**
4:00 AM	0	0	0	0	0	0	5	12	34	22	8	3	0	1	0	0	0	**85**
5:00 AM	0	0	0	0	0	2	11	26	27	27	20	4	1	0	0	0	0	**118**
6:00 AM	0	0	0	0	0	1	1	8	14	29	32	13	1	0	1	0	0	**100**
7:00 AM	0	0	0	0	2	3	5	11	18	19	27	6	1	0	0	0	0	**92**
8:00 AM	0	0	0	1	0	1	4	7	11	11	15	4	1	0	0	0	0	**55**
9:00 AM	0	0	0	2	1	1	6	10	10	10	7	3	1	0	0	0	0	**51**
10:00 AM	0	0	0	0	1	2	5	6	9	10	9	7	1	0	1	0	0	**51**
11:00 AM	0	1	1	1	4	1	6	12	24	21	18	5	4	1	0	0	0	**99**
12:00 PM	0	0	0	1	3	1	2	9	12	18	20	12	3	1	0	0	0	**82**
1:00 PM	0	0	0	1	0	2	3	7	17	11	25	13	0	0	0	0	0	**79**
2:00 PM	0	0	0	0	1	1	3	7	11	15	16	11	5	2	1	0	0	**73**
3:00 PM	0	0	0	0	1	3	5	5	13	17	17	7	0	0	0	0	0	**68**
4:00 PM	0	0	0	0	1	1	4	8	24	25	17	11	1	0	0	0	0	**92**
5:00 PM	0	0	0	0	2	1	5	17	19	19	19	8	1	0	0	0	0	**91**
6:00 PM	0	0	0	1	1	0	1	5	6	11	10	11	2	0	0	0	0	**48**
7:00 PM	0	0	0	0	1	0	3	6	8	9	8	5	1	1	0	0	0	**42**
8:00 PM	0	0	0	0	1	1	1	3	4	7	5	3	1	0	0	0	0	**26**
9:00 PM	0	0	0	0	1	0	1	2	2	5	5	3	3	1	0	0	0	**23**
10:00 PM	0	0	0	0	0	1	1	1	2	5	15	8	1	0	0	0	0	**34**
11:00 PM	0	0	0	1	0	0	1	2	1	3	1	1	0	0	0	0	0	**10**
Total	**0**	**1**	**1**	**9**	**21**	**23**	**74**	**167**	**270**	**298**	**297**	**140**	**29**	**7**	**3**	**0**	**0**	**1,340**
Percent	**0.0%**	**0.1%**	**0.1%**	**0.7%**	**1.6%**	**1.7%**	**5.5%**	**12.5%**	**20.1%**	**22.2%**	**22.2%**	**10.4%**	**2.2%**	**0.5%**	**0.2%**	**0.0%**	**0.0%**	

Note: Average only condsidered on days with 24-hours of data.

Total Study Percentile Speed Summary			Total Study Speed Statistics		
50th Percentile (Median)	51.9	mph	Mean (Average) Speed	51.2	mph
85th Percentile	59.3	mph	10 mph Pace	48.1 - 58.1	mph
95th Percentile	62.9	mph	Percent in Pace	46.8	%

Location: STRATFORD RD (ROAD J NE) S/O ROAD 7 NE
Date Range: 3/10/2015 to 3/11/2015
Site Code: 01

DATA SOLUTIONS

Total Study Average
Southbound

Time	Speed Range (mph)																	Total
Time	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
12:00 AM	0	0	0	0	0	0	0	1	0	3	1	0	0	0	0	0	0	**5**
1:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	**2**
2:00 AM	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	**4**
3:00 AM	0	0	0	0	0	1	2	1	1	0	1	0	0	0	0	0	0	**6**
4:00 AM	0	0	0	0	0	1	10	21	9	2	1	1	0	0	0	0	0	**45**
5:00 AM	0	0	0	1	1	2	11	7	4	3	3	1	0	0	0	0	0	**33**
6:00 AM	0	0	0	0	1	1	1	3	3	5	16	2	0	0	0	0	0	**32**
7:00 AM	0	0	0	0	1	2	5	12	21	18	18	4	1	0	0	0	0	**82**
8:00 AM	0	0	0	1	1	1	4	12	8	10	15	2	0	0	0	0	0	**54**
9:00 AM	0	0	0	0	2	3	3	9	5	7	7	5	1	0	1	0	0	**43**
10:00 AM	0	0	0	1	2	2	6	8	7	12	10	4	0	0	0	0	0	**52**
11:00 AM	0	1	2	5	4	7	10	18	21	29	42	18	1	1	1	0	0	**160**
12:00 PM	0	0	0	0	2	3	7	8	13	15	25	13	1	1	0	0	0	**88**
1:00 PM	0	0	0	1	3	3	3	11	9	11	14	5	2	0	0	0	0	**62**
2:00 PM	0	0	0	2	2	4	6	9	4	10	15	10	4	0	0	0	0	**66**
3:00 PM	0	0	0	1	1	1	8	24	24	16	40	11	2	0	0	0	0	**128**
4:00 PM	0	0	0	0	0	2	27	49	44	26	32	9	2	0	1	0	0	**192**
5:00 PM	0	0	0	1	0	2	15	27	24	34	34	10	1	0	0	0	0	**148**
6:00 PM	0	0	0	0	0	1	6	11	6	13	15	6	1	0	0	0	0	**59**
7:00 PM	0	0	0	0	1	2	3	4	5	6	9	3	1	0	0	0	0	**34**
8:00 PM	0	1	0	0	0	2	3	5	3	3	4	3	0	1	0	0	0	**25**
9:00 PM	0	0	0	1	2	1	3	1	6	3	2	1	0	0	0	0	0	**20**
10:00 PM	0	0	0	0	0	0	0	1	3	6	2	1	0	0	0	0	0	**13**
11:00 PM	0	0	0	0	0	0	2	6	3	5	13	4	1	0	0	0	0	**34**
Total	**0**	**2**	**2**	**14**	**23**	**41**	**137**	**248**	**223**	**239**	**319**	**114**	**19**	**3**	**3**	**0**	**0**	**1,387**
Percent	**0.0%**	**0.1%**	**0.1%**	**1.0%**	**1.7%**	**3.0%**	**9.9%**	**17.9%**	**16.1%**	**17.2%**	**23.0%**	**8.2%**	**1.4%**	**0.2%**	**0.2%**	**0.0%**	**0.0%**	

Note: Average only condsidered on days with 24-hours of data.

Total Study Percentile Speed Summary			Total Study Speed Statistics		
50th Percentile (Median)	50.1	mph	Mean (Average) Speed	49.4	mph
85th Percentile	58.4	mph	10 mph Pace	50.6 - 60.6	mph
95th Percentile	61.7	mph	Percent in Pace	41.5	%

Mark Skaggs:425-250-0777
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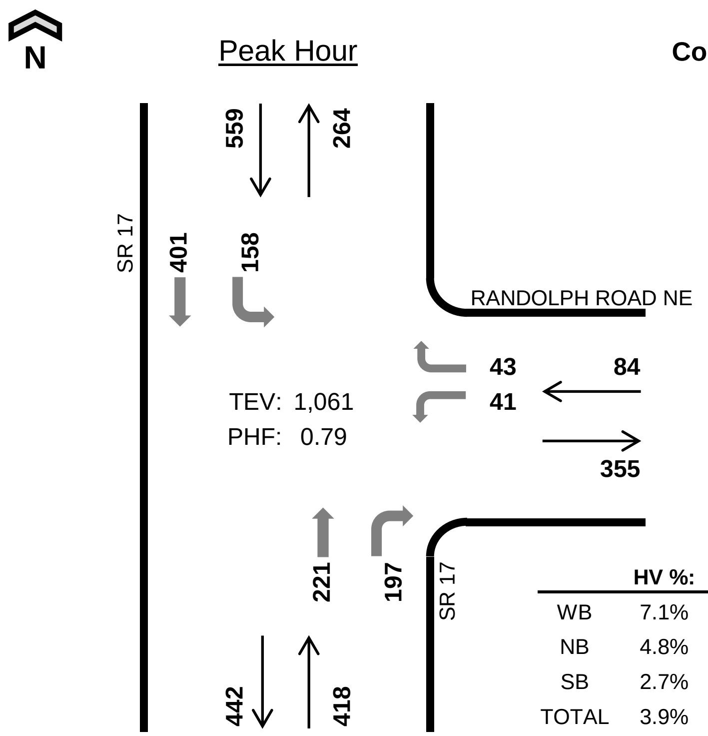
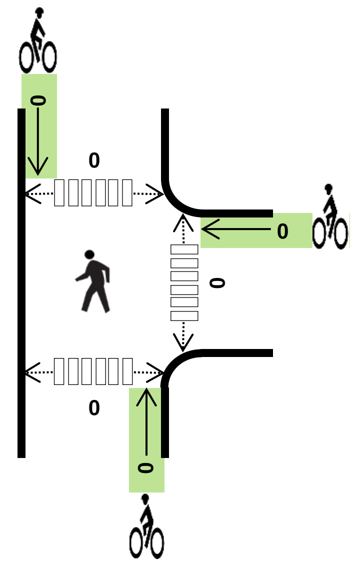
SR 17
RANDOLPH ROAD NE

idax

Date: Wed, Mar 11, 2015
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
WB	7.1%	0.81
NB	4.8%	0.79
SB	2.7%	0.76
TOTAL	3.9%	0.79



Two-Hour Count Summaries

Interval Start	RANDOLPH ROAD NE			RANDOLPH ROAD NE			SR 17			SR 17			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	2	0	7	0	39	17	19	60	0	144	
7:15 AM	**0**	**0**	**0**	**11**	**0**	**15**	**0**	**45**	**34**	**23**	**90**	**0**	**218**	
7:30 AM	**0**	**0**	**0**	**7**	**0**	**13**	**0**	**69**	**38**	**34**	**135**	**0**	**296**	
7:45 AM	**0**	**0**	**0**	**11**	**0**	**9**	**0**	**58**	**74**	**76**	**108**	**0**	**336**	994
8:00 AM	**0**	**0**	**0**	**12**	**0**	**6**	**0**	**49**	**51**	**25**	**68**	**0**	**211**	**1,061**
8:15 AM	0	0	0	5	0	5	0	51	19	18	62	0	160	1,003
8:30 AM	0	0	0	9	0	12	0	51	21	17	70	0	180	887
8:45 AM	0	0	0	12	0	9	0	36	39	29	57	0	182	733
Count Total	0	0	0	69	0	76	0	398	293	241	650	0	1,727	
Peak Hr	**0**	**0**	**0**	**41**	**0**	**43**	**0**	**221**	**197**	**158**	**401**	**0**	**1,061**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	1	2	4	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**0**	**3**	**4**	**6**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:30 AM	**0**	**0**	**2**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**0**	**1**	**5**	**1**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**0**	**2**	**9**	**5**	***16***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	0	2	4	6	*12*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	7	2	4	*13*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	1	4	5	*10*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	17	32	34	*83*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**6**	**20**	**15**	***41***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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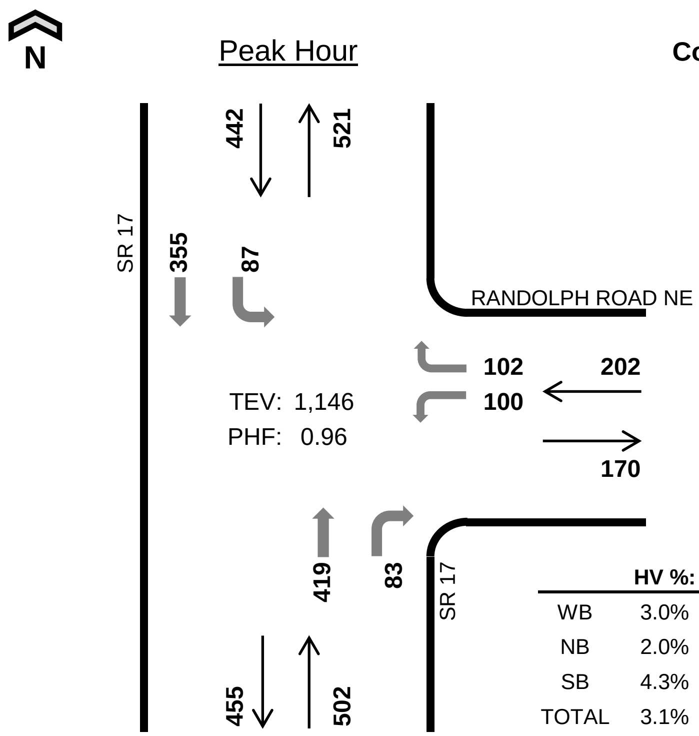
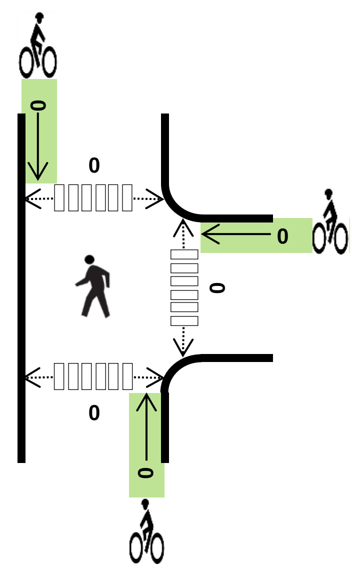
SR 17
RANDOLPH ROAD NE

Date: Tue, Mar 10, 2015
Count Period: 3:30 PM to 5:30 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
WB	3.0%	0.83
NB	2.0%	0.93
SB	4.3%	0.98
TOTAL	3.1%	0.96



Two-Hour Count Summaries

Interval Start	RANDOLPH ROAD NE Eastbound			RANDOLPH ROAD NE Westbound			SR 17 Northbound			SR 17 Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
3:30 PM	0	0	0	39	0	26	0	79	9	16	68	0	237	
3:45 PM	0	0	0	23	0	35	0	92	16	19	57	0	242	
4:00 PM	0	0	0	56	0	47	0	91	13	11	74	0	292	
4:15 PM	0	0	0	33	0	36	0	72	15	27	87	0	270	1,041
4:30 PM	**0**	**0**	**0**	**30**	**0**	**31**	**0**	**104**	**22**	**19**	**89**	**0**	**295**	1,099
4:45 PM	**0**	**0**	**0**	**20**	**0**	**27**	**0**	**99**	**19**	**19**	**93**	**0**	**277**	1,134
5:00 PM	**0**	**0**	**0**	**30**	**0**	**21**	**0**	**116**	**19**	**33**	**80**	**0**	**299**	1,141
5:15 PM	**0**	**0**	**0**	**20**	**0**	**23**	**0**	**100**	**23**	**16**	**93**	**0**	**275**	**1,146**
Count Total	0	0	0	251	0	246	0	753	136	160	641	0	2,187	
Peak Hr	**0**	**0**	**0**	**100**	**0**	**102**	**0**	**419**	**83**	**87**	**355**	**0**	**1,146**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
3:30 PM	0	4	4	4	*12*	0	0	0	0	*0*	0	0	0	0	*0*
3:45 PM	0	0	6	2	*8*	0	0	0	0	*0*	0	0	0	0	*0*
4:00 PM	0	2	4	6	*12*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	1	0	10	*11*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**0**	**3**	**4**	**10**	***17***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**0**	**1**	**1**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**0**	**1**	**2**	**5**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**1**	**3**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	0	13	24	41	*78*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**6**	**10**	**19**	***35***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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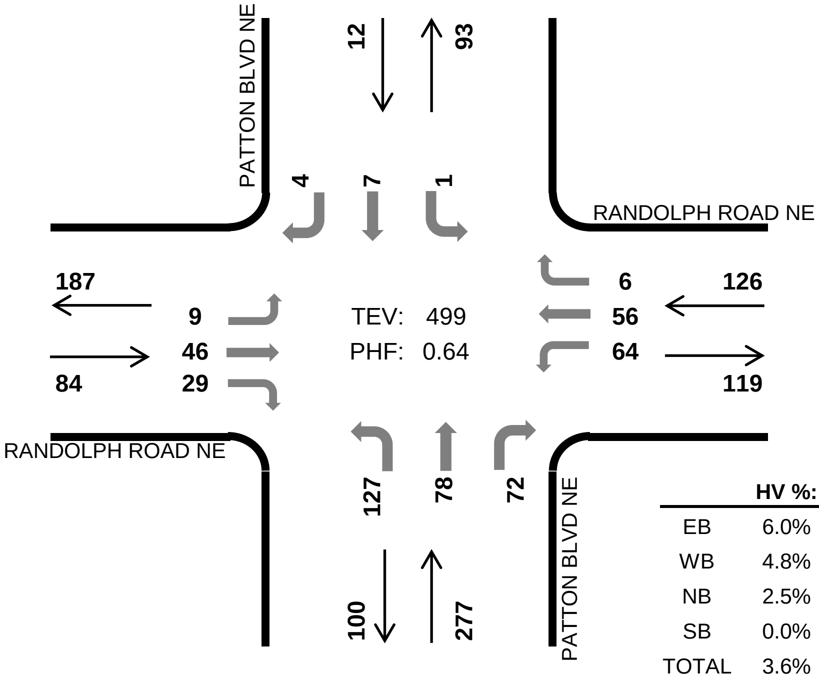
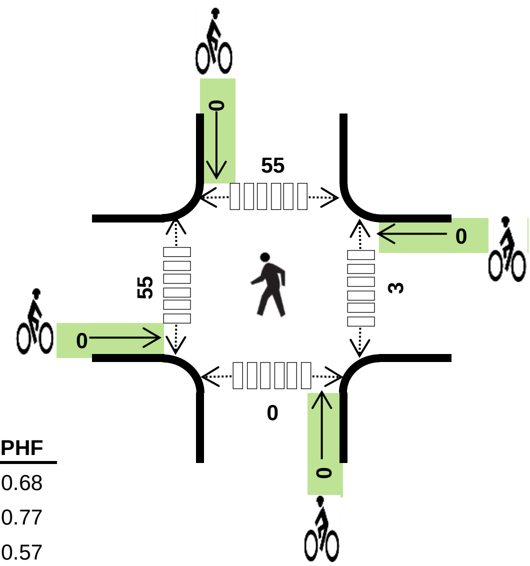
PATTON BLVD NE
RANDOLPH ROAD NE

idax

Date: Wed, Mar 11, 2015
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM

Peak Hour





	HV %:	PHF
EB	6.0%	0.68
WB	4.8%	0.77
NB	2.5%	0.57
SB	0.0%	0.43
TOTAL	3.6%	0.64

Two-Hour Count Summaries

Interval Start	RANDOLPH ROAD NE			RANDOLPH ROAD NE			PATTON BLVD NE			PATTON BLVD NE			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	3	11	2	3	6	1	4	11	6	0	1	0	48	
7:15 AM	**3**	**9**	**7**	**7**	**14**	**2**	**8**	**15**	**14**	**0**	**1**	**2**	**82**	
7:30 AM	**3**	**8**	**4**	**27**	**13**	**1**	**20**	**16**	**32**	**0**	**0**	**0**	**124**	
7:45 AM	**2**	**23**	**6**	**25**	**14**	**1**	**70**	**30**	**22**	**0**	**1**	**1**	**195**	449
8:00 AM	**1**	**6**	**12**	**5**	**15**	**2**	**29**	**17**	**4**	**1**	**5**	**1**	**98**	**499**
8:15 AM	0	8	6	4	5	1	13	13	5	0	8	0	63	480
8:30 AM	0	6	13	7	6	4	16	16	5	0	8	1	82	438
8:45 AM	1	6	4	1	11	2	38	26	2	0	4	1	96	339
Count Total	13	77	54	79	84	14	198	144	90	1	28	6	788	
Peak Hr	**9**	**46**	**29**	**64**	**56**	**6**	**127**	**78**	**72**	**1**	**7**	**4**	**499**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**2**	**1**	**2**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**3**	**19**	**19**	**0**	***41***
7:30 AM	**2**	**1**	**3**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**14**	**14**	**0**	***28***
7:45 AM	**0**	**2**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**17**	**17**	**0**	***34***
8:00 AM	**1**	**2**	**2**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**5**	**5**	**0**	***10***
8:15 AM	3	2	1	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	3	7	0	2	*12*	0	0	0	0	*0*	0	2	1	0	*3*
8:45 AM	3	1	1	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	15	17	9	3	*44*	0	0	0	0	*0*	3	57	56	0	*116*
Peak Hr	**5**	**6**	**7**	**0**	***18***	**0**	**0**	**0**	**0**	***0***	**3**	**55**	**55**	**0**	***113***

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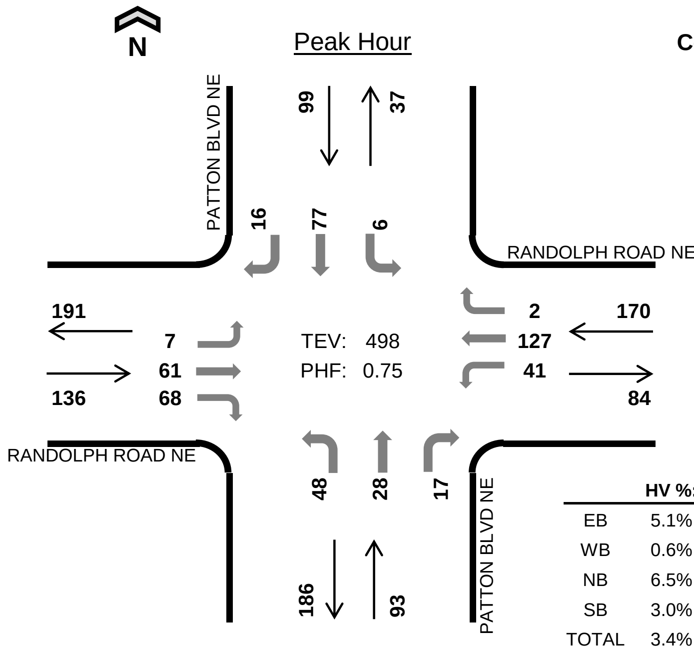
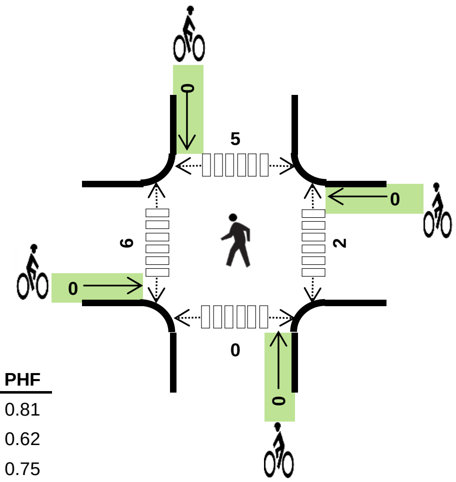
PATTON BLVD NE
RANDOLPH ROAD NE

Date: Tue, Mar 10, 2015
Count Period: 2:00 PM to 5:30 PM
Peak Hour: 4:00 PM to 5:00 PM





	HV %:	PHF
EB	5.1%	0.81
WB	0.6%	0.62
NB	6.5%	0.75
SB	3.0%	0.56
TOTAL	3.4%	0.75

Peak-Hour Count Summaries

Interval Start	RANDOLPH ROAD NE Eastbound			RANDOLPH ROAD NE Westbound			PATTON BLVD NE Northbound			PATTON BLVD NE Southbound			15-min Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
4:00 PM	2	11	17	17	52	0	14	2	6	3	34	7	165
4:15 PM	2	9	16	12	35	0	13	4	3	1	13	3	111
4:30 PM	1	23	18	9	21	1	13	5	2	1	18	4	116
4:45 PM	2	18	17	3	19	1	8	17	6	1	12	2	106
Peak Hr	**7**	**61**	**68**	**41**	**127**	**2**	**48**	**28**	**17**	**6**	**77**	**16**	**498**

Note: For all six-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	1	2	0	5	0	0	0	0	0	1	3	3	0	7
4:15 PM	1	0	3	1	5	0	0	0	0	0	1	1	1	0	3
4:30 PM	3	0	1	1	5	0	0	0	0	0	0	2	1	0	3
4:45 PM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0
Peak Hr	**7**	**1**	**6**	**3**	**17**	**0**	**0**	**0**	**0**	**0**	**2**	**6**	**5**	**0**	**13**

Six-Hour Count Summaries

Interval Start	RANDOLPH ROAD NE Eastbound LT	TH	RT	RANDOLPH ROAD NE Westbound LT	TH	RT	PATTON BLVD NE Northbound LT	TH	RT	PATTON BLVD NE Southbound LT	TH	RT	15-min Total	Rolling One Hour
2:00 PM	3	19	47	8	13	2	9	16	2	1	16	1	137	
2:15 PM	2	10	27	4	6	2	17	9	3	0	12	2	94	
2:30 PM	2	9	14	5	9	2	8	15	4	2	14	2	86	
2:45 PM	1	4	25	9	10	1	7	13	15	2	14	2	103	420
3:00 PM	0	6	15	20	19	0	8	10	7	2	13	0	100	383
3:15 PM	2	8	29	12	20	0	11	5	2	0	19	4	112	401
3:30 PM	0	9	16	8	28	0	4	10	0	1	24	7	107	422
3:45 PM	1	7	20	7	18	0	11	9	6	0	20	5	104	423
4:00 PM	**2**	**11**	**17**	**17**	**52**	**0**	**14**	**2**	**6**	**3**	**34**	**7**	**165**	488
4:15 PM	**2**	**9**	**16**	**12**	**35**	**0**	**13**	**4**	**3**	**1**	**13**	**3**	**111**	487
4:30 PM	**1**	**23**	**18**	**9**	**21**	**1**	**13**	**5**	**2**	**1**	**18**	**4**	**116**	496
4:45 PM	**2**	**18**	**17**	**3**	**19**	**1**	**8**	**17**	**6**	**1**	**12**	**2**	**106**	**498**
5:00 PM	0	27	25	10	28	1	9	9	8	4	24	3	148	481
5:15 PM	1	10	17	6	20	2	9	10	4	0	9	2	90	460
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	344
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	238
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	90
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	19	170	303	130	298	12	141	134	68	18	242	44	1,579	
Peak Hr	**7**	**61**	**68**	**41**	**127**	**2**	**48**	**28**	**17**	**6**	**77**	**16**	**498**	

Note: Six-hour count summary volumes include heavy vehicles but excludes bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
2:00 PM	5	6	2	0	*13*	0	0	0	0	*0*	0	0	0	0	*0*
2:15 PM	4	3	5	2	*14*	0	0	0	0	*0*	0	0	0	0	*0*
2:30 PM	3	2	1	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
2:45 PM	0	0	2	2	*4*	0	0	0	0	*0*	0	29	33	0	*62*
3:00 PM	2	2	1	0	*5*	0	0	0	0	*0*	4	65	66	0	*135*
3:15 PM	1	3	3	3	*10*	0	0	0	0	*0*	0	0	0	0	*0*
3:30 PM	2	1	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
3:45 PM	2	1	2	0	*5*	0	0	0	0	*0*	0	1	1	0	*2*
4:00 PM	**2**	**1**	**2**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**3**	**0**	***7***
4:15 PM	**1**	**0**	**3**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**1**	**0**	***3***
4:30 PM	**3**	**0**	**1**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**1**	**0**	***3***
4:45 PM	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	3	1	1	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	1	2	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	29	21	25	10	*85*	0	0	0	0	*0*	6	101	105	0	*212*
Peak Hr	**7**	**1**	**6**	**3**	***17***	**0**	**0**	**0**	**0**	***0***	**2**	**6**	**5**	**0**	***13***

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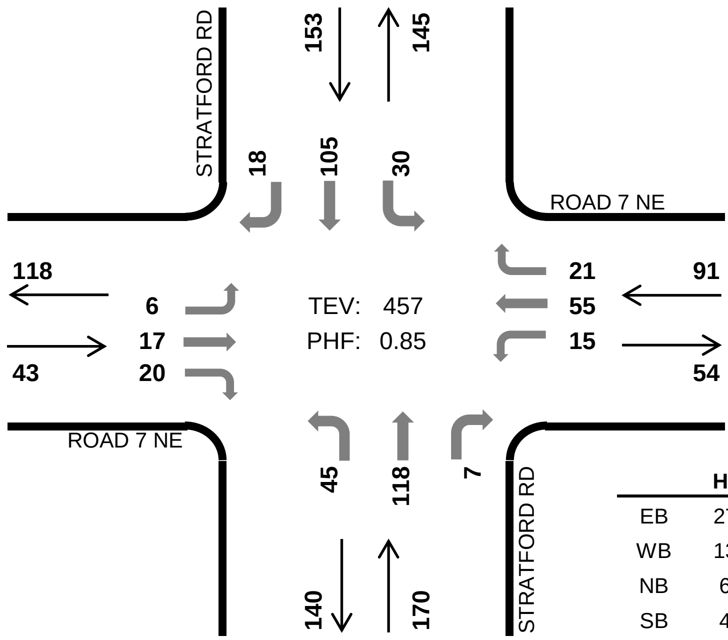
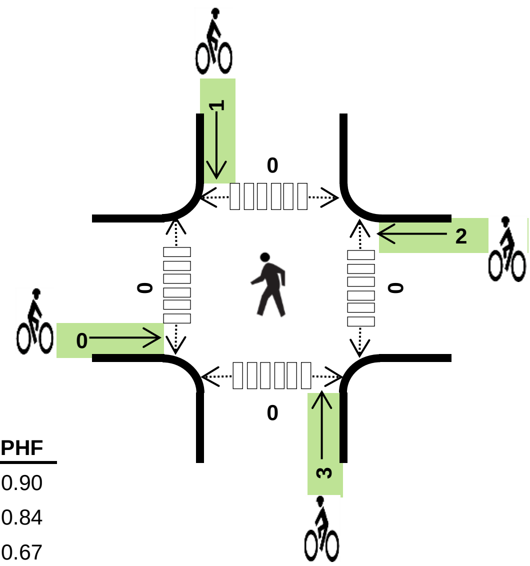
STRATFORD RD
ROAD 7 NE

Date: Wed, Mar 11, 2015
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM

Peak Hour





	HV %:	PHF
EB	27.9%	0.90
WB	13.2%	0.84
NB	6.5%	0.67
SB	4.6%	0.58
TOTAL	9.2%	0.85

Two-Hour Count Summaries

Interval Start	ROAD 7 NE Eastbound LT	TH	RT	ROAD 7 NE Westbound LT	TH	RT	STRATFORD RD Northbound LT	TH	RT	STRATFORD RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	3	2	6	3	5	3	6	17	0	8	29	2	84	
7:15 AM	**0**	**5**	**6**	**4**	**11**	**7**	**8**	**25**	**2**	**13**	**48**	**5**	**134**	
7:30 AM	**0**	**5**	**4**	**8**	**14**	**5**	**14**	**26**	**2**	**7**	**24**	**6**	**115**	
7:45 AM	**2**	**4**	**6**	**1**	**12**	**7**	**15**	**45**	**3**	**5**	**18**	**4**	**122**	455
8:00 AM	**4**	**3**	**4**	**2**	**18**	**2**	**8**	**22**	**0**	**5**	**15**	**3**	**86**	**457**
8:15 AM	1	6	6	5	7	7	4	12	2	6	12	2	70	393
8:30 AM	4	12	1	5	3	7	4	14	2	5	25	2	84	362
8:45 AM	1	3	3	5	6	5	13	10	4	2	13	3	68	308
Count Total	15	40	36	33	76	43	72	171	15	51	184	27	763	
Peak Hr	**6**	**17**	**20**	**15**	**55**	**21**	**45**	**118**	**7**	**30**	**105**	**18**	**457**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	2	0	4	*6*	0	0	3	0	*3*	0	0	0	0	*0*
7:15 AM	**2**	**4**	**2**	**2**	***10***	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**0**	***0***
7:30 AM	**3**	**2**	**6**	**3**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**2**	**1**	**1**	**1**	***5***	**0**	**2**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**5**	**5**	**2**	**1**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	7	3	2	5	*17*	0	0	1	0	*1*	0	0	0	0	*0*
8:30 AM	7	2	3	6	*18*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	3	1	2	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	29	20	18	23	*90*	0	2	7	1	*10*	0	0	0	0	*0*
Peak Hr	**12**	**12**	**11**	**7**	***42***	**0**	**2**	**3**	**1**	**6**	**0**	**0**	**0**	**0**	***0***

Mark Skaggs: 425 - 250 - 0777
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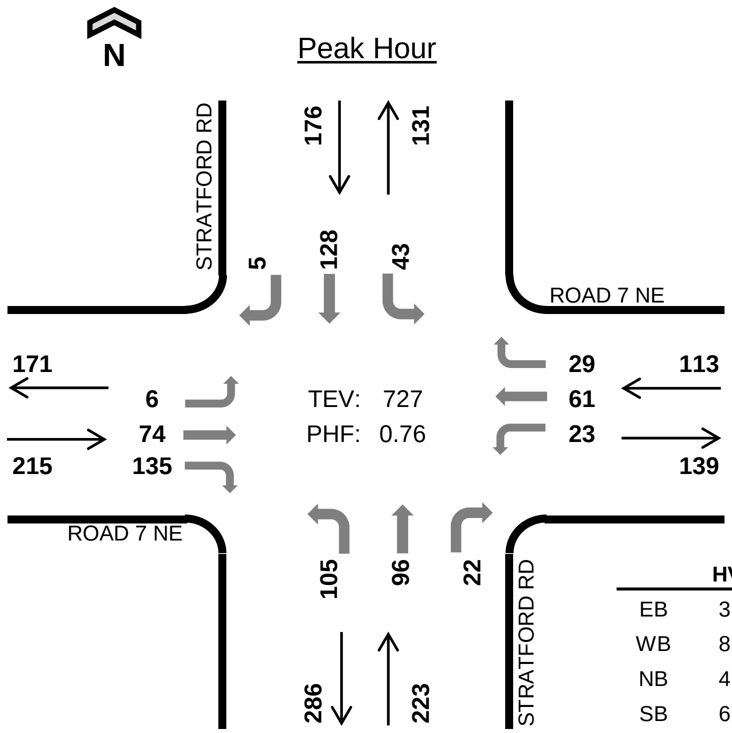
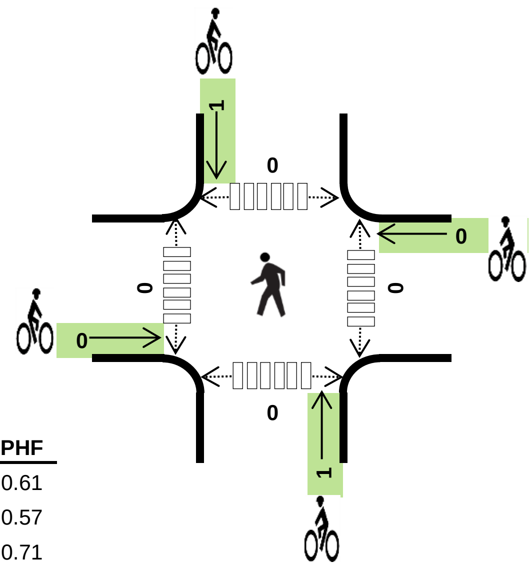
STRATFORD RD
ROAD 7 NE

Date: Tue, Mar 10, 2015
Count Period: 3:30 PM to 5:30 PM
Peak Hour: 4:15 PM to 5:15 PM

Peak Hour





	HV %:	PHF
EB	3.7%	0.61
WB	8.8%	0.57
NB	4.0%	0.71
SB	6.8%	0.66
TOTAL	5.4%	0.76

Two-Hour Count Summaries

Interval Start	ROAD 7 NE Eastbound			ROAD 7 NE Westbound			STRATFORD RD Northbound			STRATFORD RD Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
3:30 PM	0	23	15	4	6	4	4	20	7	17	73	2	175	
3:45 PM	3	25	24	6	5	6	5	23	11	4	22	0	134	
4:00 PM	0	25	102	4	3	7	4	19	6	16	50	0	236	
4:15 PM	**2**	**25**	**61**	**0**	**5**	**7**	**10**	**23**	**4**	**11**	**29**	**0**	**177**	722
4:30 PM	**0**	**19**	**28**	**3**	**13**	**7**	**16**	**33**	**6**	**11**	**24**	**2**	**162**	709
4:45 PM	**2**	**12**	**21**	**5**	**18**	**5**	**35**	**12**	**6**	**9**	**22**	**1**	**148**	723
5:00 PM	**2**	**18**	**25**	**15**	**25**	**10**	**44**	**28**	**6**	**12**	**53**	**2**	**240**	**727**
5:15 PM	0	9	21	8	17	13	20	29	4	3	27	0	151	701
Count Total	9	156	297	45	92	59	138	187	50	83	300	7	1,423	
Peak Hr	**6**	**74**	**135**	**23**	**61**	**29**	**105**	**96**	**22**	**43**	**128**	**5**	**727**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
3:30 PM	0	2	5	2	*9*	0	0	0	0	*0*	0	0	0	0	*0*
3:45 PM	2	4	2	2	*10*	0	0	0	0	*0*	0	0	0	0	*0*
4:00 PM	0	5	6	2	*13*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	**3**	**0**	**3**	**5**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:30 PM	**3**	**3**	**4**	**4**	***14***	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**1**	**4**	**1**	**2**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**1**	**3**	**1**	**1**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	1	3	1	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	11	24	23	18	*76*	0	0	1	1	*2*	0	0	0	0	*0*
Peak Hr	**8**	**10**	**9**	**12**	***39***	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	***0***

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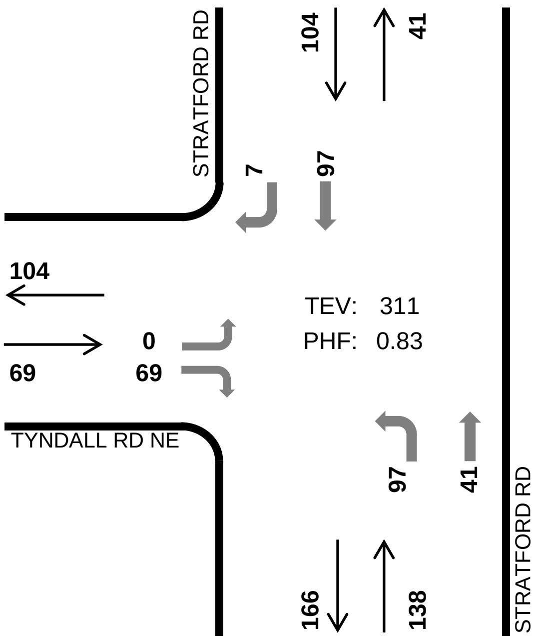
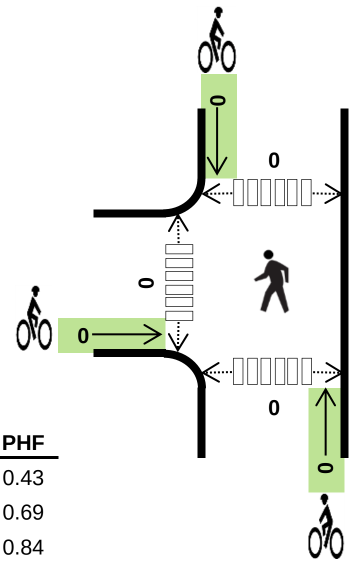
STRATFORD RD
TYNDALL RD NE

Date: Wed, Mar 11, 2015
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:00 AM to 8:00 AM

Peak Hour



TEV: 311
PHF: 0.83



	HV %:	PHF
EB	2.9%	0.43
NB	8.7%	0.69
SB	5.8%	0.84
TOTAL	6.4%	0.83

Two-Hour Count Summaries

Interval Start	TYNDALL RD NE Eastbound LT	TH	RT	TYNDALL RD NE Westbound LT	TH	RT	STRATFORD RD Northbound LT	TH	RT	STRATFORD RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	**0**	**0**	**15**	**0**	**0**	**0**	**19**	**6**	**0**	**0**	**24**	**3**	**67**	
7:15 AM	**0**	**0**	**40**	**0**	**0**	**0**	**18**	**12**	**0**	**0**	**24**	**0**	**94**	
7:30 AM	**0**	**0**	**7**	**0**	**0**	**0**	**18**	**15**	**0**	**0**	**29**	**2**	**71**	
7:45 AM	**0**	**0**	**7**	**0**	**0**	**0**	**42**	**8**	**0**	**0**	**20**	**2**	**79**	**311**
8:00 AM	0	0	4	0	0	0	20	9	0	0	18	0	51	295
8:15 AM	0	0	5	0	0	0	9	12	0	0	15	2	43	244
8:30 AM	1	0	6	0	0	0	8	14	0	0	24	1	54	227
8:45 AM	1	0	0	0	0	0	5	9	0	0	15	1	31	179
Count Total	2	0	84	0	0	0	139	85	0	0	169	11	490	
Peak Hr	**0**	**0**	**69**	**0**	**0**	**0**	**97**	**41**	**0**	**0**	**97**	**7**	**311**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	**0**	**0**	**2**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:15 AM	**1**	**0**	**6**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:30 AM	**0**	**0**	**4**	**2**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	2	0	3	2	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	3	0	1	1	*5*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	8	0	17	9	*34*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**2**	**0**	**12**	**6**	***20***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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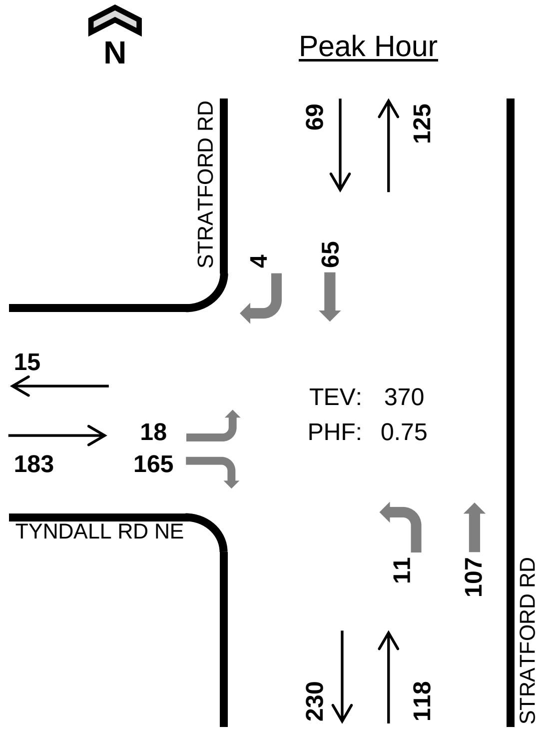
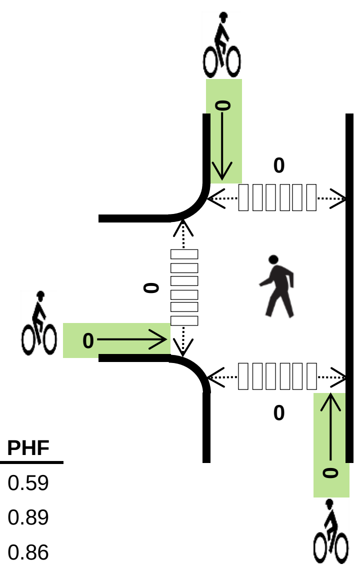
STRATFORD RD
TYNDALL RD NE

Date: Tue, Mar 10, 2015
Count Period: 3:30 PM to 5:30 PM
Peak Hour: 3:30 PM to 4:30 PM

Peak Hour





	HV %:	PHF
EB	2.2%	0.59
NB	11.0%	0.89
SB	10.1%	0.86
TOTAL	6.5%	0.75

Two-Hour Count Summaries

Interval Start	TYNDALL RD NE Eastbound LT	TH	RT	TYNDALL RD NE Westbound LT	TH	RT	STRATFORD RD Northbound LT	TH	RT	STRATFORD RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
3:30 PM	**3**	**0**	**75**	**0**	**0**	**0**	**3**	**24**	**0**	**0**	**18**	**1**	**124**	
3:45 PM	**0**	**0**	**13**	**0**	**0**	**0**	**2**	**31**	**0**	**0**	**12**	**0**	**58**	
4:00 PM	**6**	**0**	**53**	**0**	**0**	**0**	**5**	**22**	**0**	**0**	**17**	**1**	**104**	
4:15 PM	**9**	**0**	**24**	**0**	**0**	**0**	**1**	**30**	**0**	**0**	**18**	**2**	**84**	**370**
4:30 PM	7	0	17	0	0	0	9	32	0	0	20	1	86	332
4:45 PM	3	0	6	0	0	0	2	18	0	0	26	1	56	330
5:00 PM	10	0	51	0	0	0	2	36	0	0	18	6	123	349
5:15 PM	2	0	16	0	0	0	0	41	0	0	13	1	73	338
Count Total	40	0	255	0	0	0	24	234	0	0	142	13	708	
Peak Hr	**18**	**0**	**165**	**0**	**0**	**0**	**11**	**107**	**0**	**0**	**65**	**4**	**370**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
3:30 PM	**0**	**0**	**3**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
3:45 PM	**1**	**0**	**2**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:00 PM	**0**	**0**	**7**	**2**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:15 PM	**3**	**0**	**1**	**3**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:30 PM	1	0	2	4	*7*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	0	2	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	6	0	17	13	*36*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**4**	**0**	**13**	**7**	***24***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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References for Grant County Transportation Analysis

Grant County, 2014 Safe Routes to School Grant Application Form, September 29, 2014.

Grant County, *2015-2020 Transportation Improvement Program*, July 22, 2014.

Grant County, *All-Season Map*, 2011.

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Washington State Department of Transportation, *Level of Service Standards for Washington State Highways*, January 1, 2010.

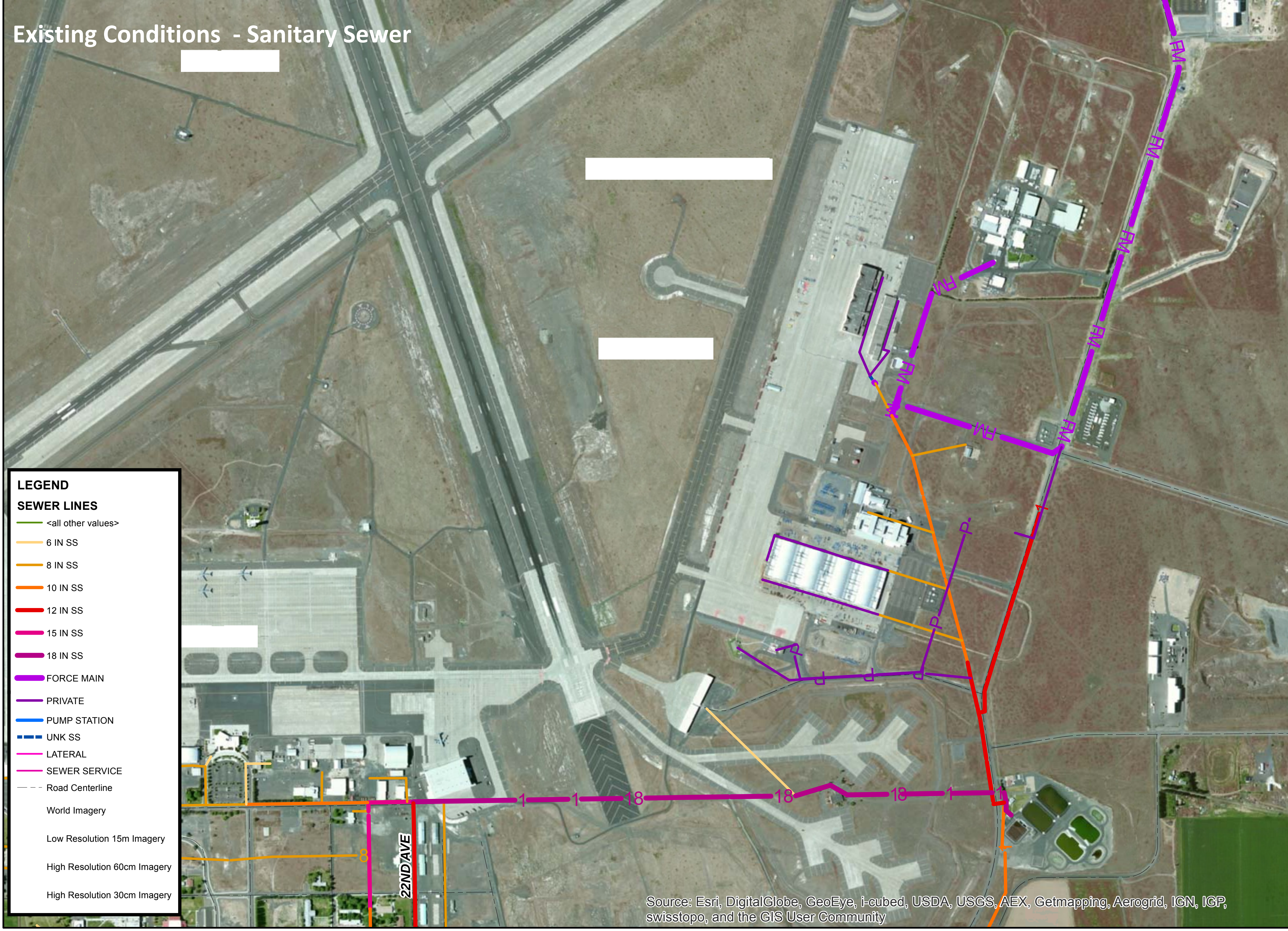
Appendix D

Utilities Maps

CITY OF MOSES LAKE

Document Path:

Existing Conditions - Sanitary Sewer



CITY OF MOSES LAKE

Document Path:

Existing Conditions - Electrical

None

Existing Conditions - Natural Gas

None

Moses Lake 4-E

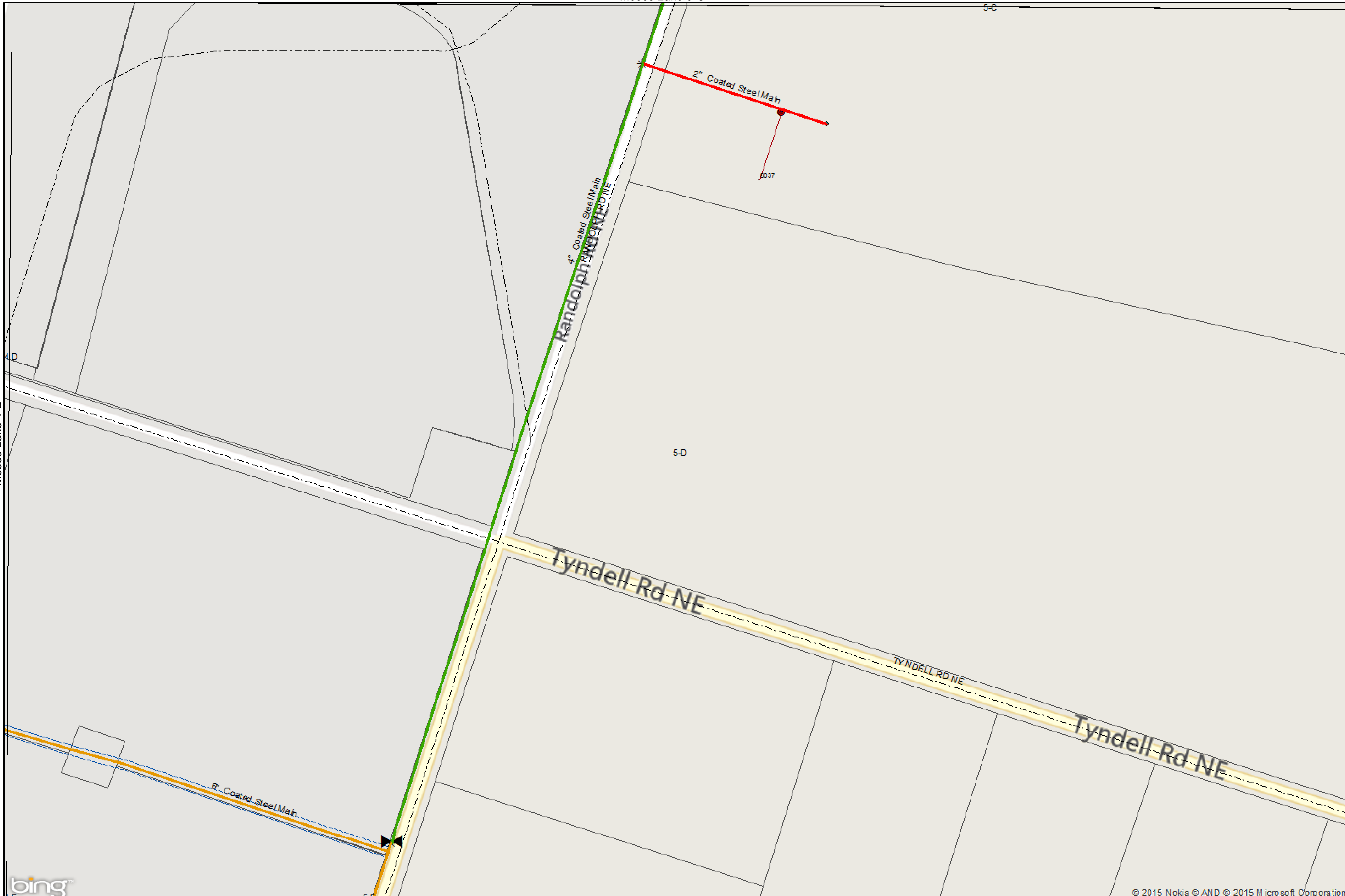
Cascade Natural Gas Corp.
Created by: Mark Bitton
Date: 3/18/2015

Moses Lake 5-D

500 Feet
0
250
500

Moses Lake 4-D
031558179

Moses Lake 5-C



Moses Lake 4-D

Moses Lake 5-E

Cascade Natural Gas Corp.
Created by: Mark Bitton
Date: 3/18/2015

Moses Lake 5-D
031558179

Moses Lake 4-D

None

None

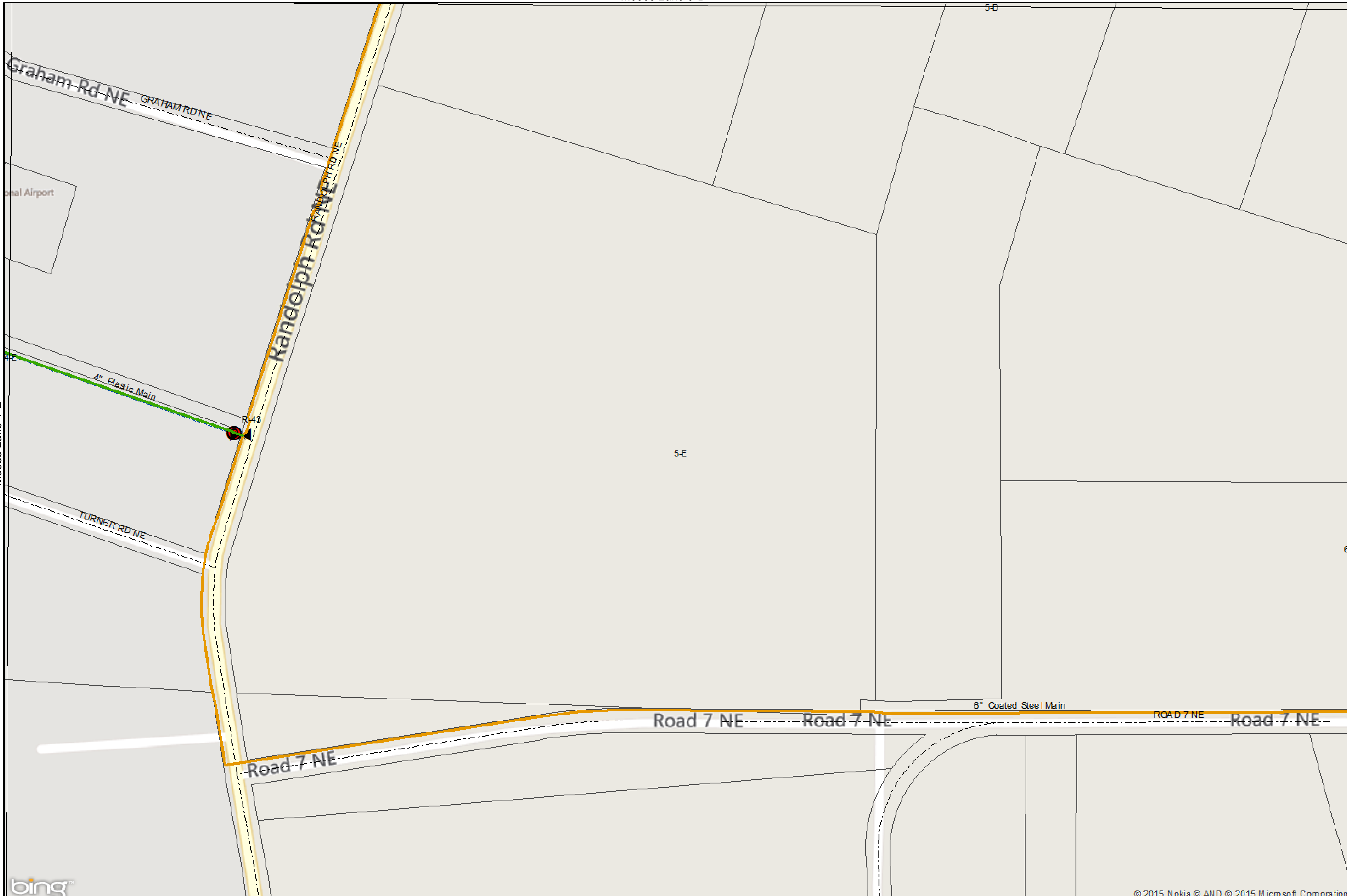
Moses Lake 5-E

500 Feet
0
250
500

Cascade Natural Gas Corp.
Created by: Mark Bitton
Date: 3/18/2015

Moses Lake 4-E
031558179

Moses Lake 5-D



Moses Lake 4-E

Cascade Natural Gas Corp.
Created by: Mark Bitton
Date: 3/18/2015

500 Feet
500 250 0 500

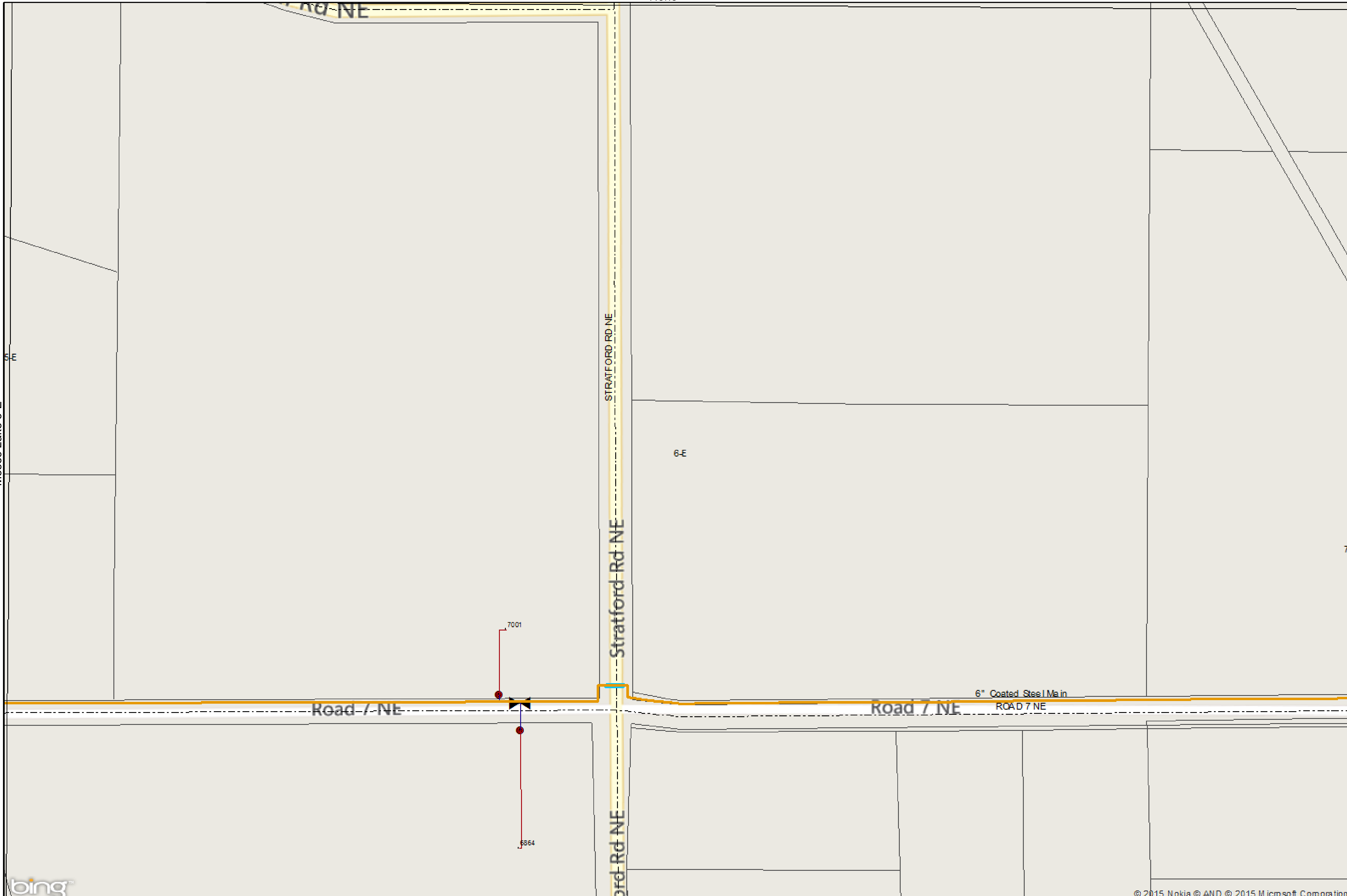
Moses Lake 6-E

Moses Lake 5-E
031558179

None

None

Moses Lake 5-E



None

Moses Lake 7-E

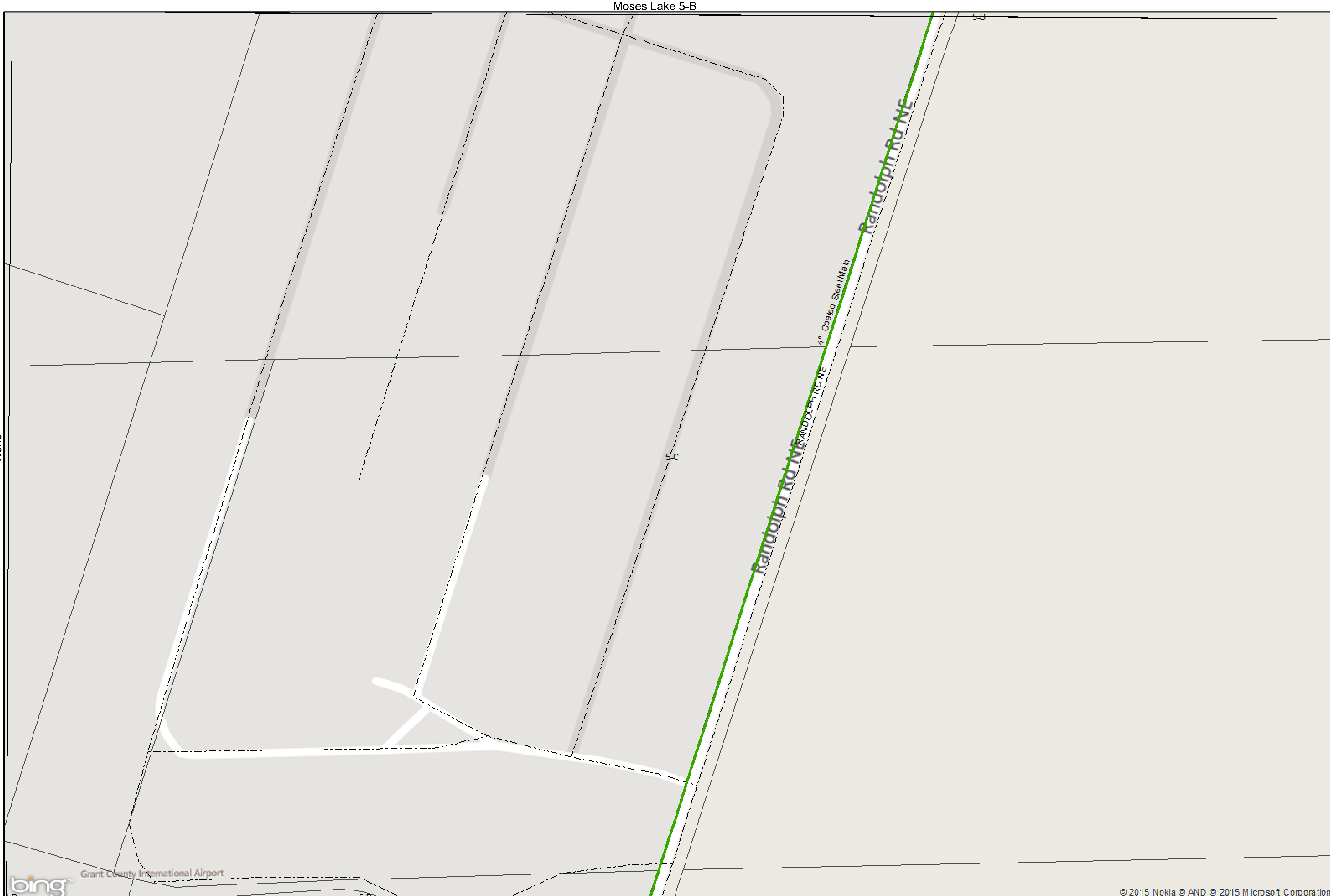
Cascade Natural Gas Corp.
Created by: Mark Bitton
Date: 3/18/2015

500 250 0 500 Feet

Moses Lake 6-E
031558179

Moses Lake 5-B

None

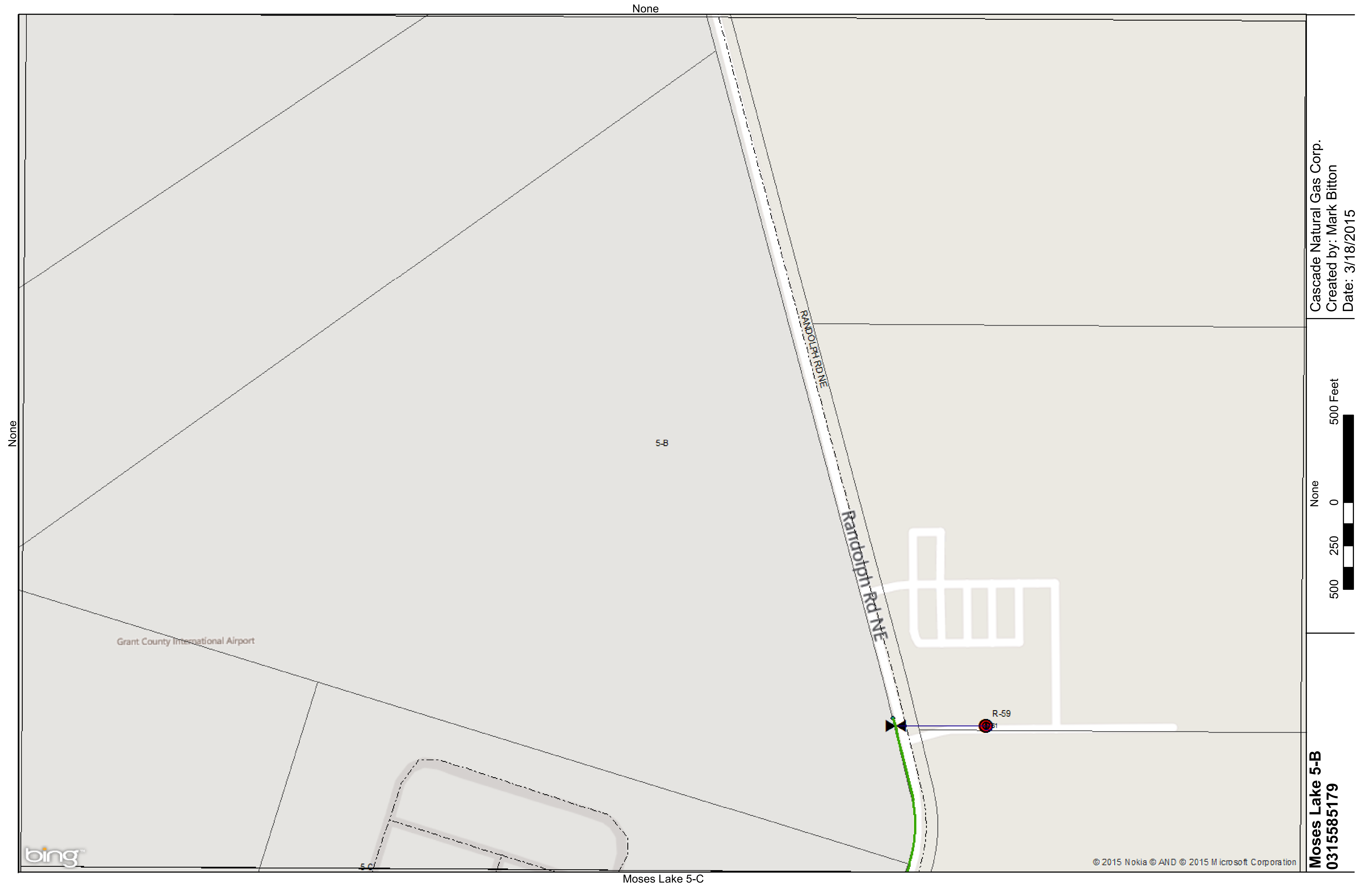


Moses Lake 5-D

Cascade Natural Gas Corp.
Created by: Mark Bitton
Date: 3/18/2015

500 Feet
None
0
250
500

Moses Lake 5-C
031558179



None
None
5-B
RANDOLPH RD NE
Randolph Rd NE
Grant County International Airport
R-59
5-C
© 2015 Nokia © AND © 2015 Microsoft Corporation
Moses Lake 5-C
Cascade Natural Gas Corp.
Created by: Mark Bitton
Date: 3/18/2015
500 Feet
None
0
250
500
Moses Lake 5-B
031558179

References

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Appendix E

Development Assumptions Worksheets

GRANT COUNTY AIRPORT EIS
Building Square Footage
Alternative 1

Parcel No.	Gross Square Feet	Gross Acres	Assumed Land Use	Floor Area Ratio	Bldg. Square Feet	Bldg. Acres	Desgnation	Jurisdiction
110069507*	4,296,322.80	98.6	Heavy industrial	0.25	1,074,081	24.7	Heavy Industrial	Moses Lake
170989000*^	3,121,488.00	71.7	FBO(fueling, hangaring, maint.) Special aviation services	0.20	624,298	14.3	Aviation Development	Grant County
170989000*^	2,292,689.00	52.6	Aiport Operations				Aiport Operations	Grant County
171020000*	6,243,912.00	143.3	FBO(fueling, hangaring, maint.) Special aviation services	0.20	1,248,782	28.7	Aviation Development	Grant County
171020000*	4,600,699.00	105.6	Airport Operations				Airport Operations	Grant County
170991000*	1,861,902.00	42.7	FBO(fueling, hangaring, maint.) Special aviation services	0.20	372,380	8.5	Aviation Development	Grant County
171017000*	1,184,526.00	27.2	Airport Operations		-	0.0	Aviation Development	Grant County
170997000	2,265,120.00	52.0	Heavy industrial/warehousing	0.15	339,768	7.8	Heavy Industrial	Grant County
170994000	1,477,555.20	33.9	Heavy industrial/warehousing	0.15	221,633	5.1	Heavy Industrial	Grant County
170988000	161,172.00	3.7	Heavy industrial/warehousing	0.15	24,176	0.6	Heavy Industrial	Grant County
170987000	174,240.00	4.0	Heavy industrial/warehousing	0.00	-	0.0	Heavy Industrial	Grant County
170993000	235,224.00	5.4	Heavy industrial/warehousing	0.10	23,522	0.5	Heavy Industrial	Grant County
171010000	1,328,580.00	30.5	Heavy industrial/warehousing	0.10	132,858	3.1	Heavy Industrial	Grant County
171018000	1,454,904.00	33.4	Heavy industrial/warehousing	0.00	-	0.0	Heavy Industrial	Grant County
171014000	26,136.00	0.6	Heavy industrial/warehousing	0.00	-	0.0	Heavy Industrial	Grant County
171015000	598,078.80	13.7	Heavy industrial/warehousing	0.15	89,712	2.1	Revenue Support	Grant County
171012000	1,231,876.80	28.3	Heavy industrial/warehousing	0.15	184,782	4.2	Revenue Support	Grant County
110069515	2,761,268.40	63.4	Heavy industrial/warehousing	0.20	552,254	12.7	Heavy Industrial	Moses Lake
110069516	2,446,765.20	56.2	Heavy industrial/warehousing	0.20	489,353	11.2	Heavy Industrial	Moses Lake
110069517	736,164.00	16.9	Heavy industrial/warehousing	0.20	147,233	3.4	Heavy Industrial	Moses Lake
313388000	378,972.00	8.7	Heavy industrial/warehousing	0.20	75,794	1.7	Heavy Industrial	Moses Lake
313389000	324,522.00	7.5	Heavy industrial/warehousing	0.20	64,904	1.5	Heavy Industrial	Moses Lake
110866001	123,274.80	2.8	Heavy industrial/warehousing	0.20	24,655	0.6	Heavy Industrial	Moses Lake
110866002	1,149,548.40	26.4	Heavy industrial/warehousing	0.20	229,910	5.3	Heavy Industrial	Moses Lake
312079000	427,323.60	9.8	Heavy industrial/warehousing	0.20	85,465	2.0	Heavy Industrial	Moses Lake
312081000	427,759.20	9.8	Heavy industrial/warehousing	0.20	85,552	2.0	Heavy Industrial	Moses Lake
312683000	304,484.40	7.0	Heavy industrial/warehousing	0.20	60,897	1.4	Heavy Industrial	Moses Lake
312682000	304,484.40	7.0	Heavy industrial/warehousing	0.20	60,897	1.4	Heavy Industrial	Moses Lake
312681000	307,098.00	7.1	Heavy industrial/warehousing	0.20	61,420	1.4	Heavy Industrial	Moses Lake
110069513	1,735,430.40	39.8	Heavy industrial/warehousing	0.20	347,086	8.0	Heavy Industrial	Moses Lake
090629207	916,938.00	21.1	Heavy industrial/warehousing	0.25	229,235	5.3	Heavy Industrial	Moses Lake
110069511	5,221,537.20	119.9	Heavy industrial/warehousing	0.25	1,305,384	30.0	Heavy Industrial	Moses Lake
120682301	2,047,320.00	47.0			-	0.0	Public	Moses Lake
110069508	2,614,471.20	60.0	Heavy industrial/warehousing	0.25	653,618	15.0	Heavy Industrial	Moses Lake
	54,781,333.20	1257.6			8,809,647	202.2		

*Estimated size of parcel portion within study boundary
^Acreage for area west of Taxiway "G" taken from Draft Airport Master Plan (includes 171020000)

Warehousing	10,434,798.00	239.55	2,608,700	59.89
Heavy Industry	22,994,452.80	527.88	3,955,488	90.81

GRANT COUNTY AIRPORT EIS
Building Square Footage
Alternative 2

Parcel No.	Gross Square Feet	Gross Acres	Assumed Land Use	Floor Area Ratio	Bldg. Square Feet	Bldg. Acres	Desgnation	Jurisdiction
110069507*	4,296,323	98.6	Light Industrial/Technology	0.25	1,074,081	24.7	Heavy Industrial	Moses Lake
170989000*^	3,121,488	71.7	FBO(fueling, hangaring, maint.) Special aviation services	0.20	624,298	14.3	Aviation Development	Grant County
170989000*^	2,292,689	52.6	Aiport Operations				Airport Operations	Grant County
171020000*	6,243,912	143.3	FBO(fueling, hangaring, maint.) Special aviation services	0.20	1,248,782	28.7	Aviation Development	Grant County
171020000*	4,600,699	105.6	Airport Operations				Airport Operations	Grant County
170991000*	1,861,902	42.7	FBO (non-maintenance/mechanical aviation services)	0.20	372,380	8.5	Aviation Development	Grant County
171017000*	1,184,526	27.2	Airport Operations		-		Airport Operations	Grant County
170997000	2,265,120	52.0	Light Industrial/Technology	0.15	339,768	7.8	Heavy Industrial	Grant County
170994000	1,477,555	33.9	Light Industrial/Technology	0.15	221,633	5.1	Heavy Industrial	Grant County
170988000	161,172	3.7	Light Industrial/Technology	0.15	24,176	0.6	Heavy Industrial	Grant County
170987000	174,240	4.0	Light Industrial/Technology	0.00	-	0.0	Heavy Industrial	Grant County
170993000	235,224	5.4	Light Industrial/Technology	0.10	23,522	0.5	Heavy Industrial	Grant County
171010000	1,328,580	30.5	Light Industrial/Technology	0.10	132,858	3.1	Heavy Industrial	Grant County
171018000	1,454,904	33.4	Light Industrial/Technology	0.00	-	0.0	Heavy Industrial	Grant County
171014000	26,136	0.6	Light Industrial/Technology	0.00	-	0.0	Heavy Industrial	Grant County
171015000	598,079	13.7	Light Industrial/Technology	0.30	179,424	4.1	Revenue Support	Grant County
171012000	1,231,877	28.3	Light Industrial/Technology	0.30	369,563	8.5	Revenue Support	Grant County
110069515	2,761,268	63.4	Light Industrial/Technology	0.30	828,381	19.0	Heavy Industrial	Moses Lake
110069516	2,446,765	56.2	Light Industrial/Technology	0.30	734,030	16.9	Heavy Industrial	Moses Lake
110069517	736,164	16.9	Light Industrial/Technology	0.30	220,849	5.1	Heavy Industrial	Moses Lake
313388000	378,972	8.7	Light Industrial/Technology	0.25	94,743	2.2	Heavy Industrial	Moses Lake
313389000	324,522	7.5	Light Industrial/Technology	0.25	81,131	1.9	Heavy Industrial	Moses Lake
110866001	123,275	2.8	Light Industrial/Technology	0.25	30,819	0.7	Heavy Industrial	Moses Lake
110866002	1,149,548	26.4	Light Industrial/Technology	0.25	287,387	6.6	Heavy Industrial	Moses Lake
312079000	427,324	9.8	Light Industrial/Technology	0.25	106,831	2.5	Heavy Industrial	Moses Lake
312081000	427,759	9.8	Light Industrial/Technology	0.25	106,940	2.5	Heavy Industrial	Moses Lake
312683000	304,484	7.0	Light Industrial/Technology	0.25	76,121	1.7	Heavy Industrial	Moses Lake
312682000	304,484	7.0	Light Industrial/Technology	0.25	76,121	1.7	Heavy Industrial	Moses Lake
312681000	307,098	7.1	Light Industrial/Technology	0.25	76,775	1.8	Heavy Industrial	Moses Lake
110069513	1,735,430	39.8	Light Industrial/Technology	0.30	520,629	12.0	Heavy Industrial	Moses Lake
090629207	916,938	21.1	Light Industrial/Technology	0.30	275,081	6.3	Heavy Industrial	Moses Lake
110069511	5,221,537	119.9	Light Industrial/Technology	0.25	1,305,384	30.0	Heavy Industrial	Moses Lake
120682301	2,047,320	47.0			-	0.0	Public	Moses Lake
110069508	2,614,471	60.0	Light Industrial/Technology	0.25	653,618	15.0	Heavy Industrial	Moses Lake
	54,781,333	1257.6			10,085,324	231.5		

*Estimated size of parcel portion within study boundary
^Acreage for area west of Taxiway "G" taken from Draft Airport Master Plan (includes 171020000)

Technology	10,426,522	239.36	3,127,956	71.81
Light Industrial	23,002,729	528.07	4,711,907	108.17

GRANT COUNTY AIRPORT EIS
Building Square Footage
Alternate 1

Parcel No.	Gross Square Feet	Gross Acres	Assumed Land Use	Percent Impervious	Impervious Area	Pervious Area	Jurisdiction
110069507*	4,296,322.80	98.6	Heavy industrial	0.91	3,909,654	386,669	Moses Lake
170989000*	3,123,252.00	71.7	FBO(fueling, hangaring, maint.) Special aviation services	0.95	2,967,089	156,163	Grant County
170989000*			Aiport Operations		-	-	Grant County
171020000*	6,243,890.40	143.3	FBO(fueling, hangaring, maint.) Special aviation services	0.95	5,931,696	312,195	Grant County
171020000*			Airport Operations		-	-	Grant County
170991000*	1,860,012.00	42.7	FBO(fueling, hangaring, maint.) Special aviation services	0.95	1,767,011	93,001	Grant County
171017000*			Airport Operations		-	-	Grant County
170997000	2,265,120.00	52.0	Heavy industrial/warehousing	0.91	2,061,259	203,861	Grant County
170994000	1,477,555.20	33.9	Heavy industrial/warehousing	0.91	1,344,575	132,980	Grant County
170988000	161,172.00	3.7	Heavy industrial/warehousing	0.91	146,667	14,505	Grant County
170987000	174,240.00	4.0	Heavy industrial/warehousing	0.91	158,558	15,682	Grant County
170993000	235,224.00	5.4	Heavy industrial/warehousing	0.91	214,054	21,170	Grant County
171010000	1,328,580.00	30.5	Heavy industrial/warehousing	0.91	1,209,008	119,572	Grant County
171018000	1,454,904.00	33.4	Heavy industrial/warehousing	0.91	1,323,963	130,941	Grant County
171014000	26,136.00	0.6	Heavy industrial/warehousing	0.91	23,784	2,352	Grant County
171015000	598,078.80	13.7	Heavy industrial/warehousing	0.91	544,252	53,827	Grant County
171012000	1,231,876.80	28.3	Heavy industrial/warehousing	0.91	1,121,008	110,869	Grant County
110069515	2,761,268.40	63.4	Heavy industrial/warehousing	0.91	2,512,754	248,514	Moses Lake
110069516	2,446,765.20	56.2	Heavy industrial/warehousing	0.91	2,226,556	220,209	Moses Lake
110069517	736,164.00	16.9	Heavy industrial/warehousing	0.91	669,909	66,255	Moses Lake
313388000	378,972.00	8.7	Heavy industrial/warehousing	0.91	344,865	34,107	Moses Lake
313389000	324,522.00	7.5	Heavy industrial/warehousing	0.91	295,315	29,207	Moses Lake
110866001	123,274.80	2.8	Heavy industrial/warehousing	0.91	112,180	11,095	Moses Lake
110866002	1,149,548.40	26.4	Heavy industrial/warehousing	0.91	1,046,089	103,459	Moses Lake
312079000	427,323.60	9.8	Heavy industrial/warehousing	0.91	388,864	38,459	Moses Lake
312081000	427,759.20	9.8	Heavy industrial/warehousing	0.91	389,261	38,498	Moses Lake
312683000	304,484.40	7.0	Heavy industrial/warehousing	0.91	277,081	27,404	Moses Lake
312682000	304,484.40	7.0	Heavy industrial/warehousing	0.91	277,081	27,404	Moses Lake
312681000	307,098.00	7.1	Heavy industrial/warehousing	0.91	279,459	27,639	Moses Lake
110069513	1,735,430.40	39.8	Heavy industrial/warehousing	0.91	1,579,242	156,189	Moses Lake
090629207	916,938.00	21.1	Heavy industrial/warehousing	0.91	834,414	82,524	Moses Lake
110069511	5,221,537.20	119.9	Heavy industrial/warehousing	0.91	4,751,599	469,938	Moses Lake
120682301					-		Moses Lake
110069508	2,614,471.20	60.0	Heavy industrial/warehousing	0.91	2,379,169	235,302	Moses Lake
	44,656,405.20	1025.2			41,086,415	3,569,990	
	-						

*Estimated size of parcel portion within study boundary

0.9201

Use	Total Area Sq. Ft.	Total Area Acres	Square feet	Acres
Warehousing	10,434,798	239.55	9,495,666	217.99
Heavy Industry	22,994,453	527.88	20,924,952	480.37
Aviation	11,227,154	257.74	10,665,797	244.85

GRANT COUNTY AIRPORT EIS
Building Square Footage
Alternative 2

Parcel No.	Gross Square Feet	Gross Acres	Assumed Land Use	Percent Impervious	Impervious Area	Pervious Area	Jurisdiction
110069507*	4,296,323	98.6	Light Industrial/Technology	0.81	3,480,021	816,301	Moses Lake
170989000*	3,123,252	71.7	FBO(fueling, hangaring, maint.) Special aviation services	0.95	2,967,089	156,163	Grant County
170989000*			Aiport Operations				Grant County
171020000*	6,243,890	143.3	FBO(fueling, hangaring, maint.) Special aviation services	0.95	5,931,696	312,195	Grant County
171020000*			Airport Operations				Grant County
170991000*	1,860,012	42.7	FBO (non-maintenance/mechanical aviation services)	0.95	1,767,011	93,001	Grant County
171017000*			Airport Operations				Grant County
170997000	2,265,120	52.0	Light Industrial/Technology	0.81	1,834,747	430,373	Grant County
170994000	1,477,555	33.9	Light Industrial/Technology	0.81	1,196,820	280,735	Grant County
170988000	161,172	3.7	Light Industrial/Technology	0.81	130,549	30,623	Grant County
170987000	174,240	4.0	Light Industrial/Technology	0.81	141,134	33,106	Grant County
170993000	235,224	5.4	Light Industrial/Technology	0.81	190,531	44,693	Grant County
171010000	1,328,580	30.5	Light Industrial/Technology	0.81	1,076,150	252,430	Grant County
171018000	1,454,904	33.4	Light Industrial/Technology	0.81	1,178,472	276,432	Grant County
171014000	26,136	0.6	Light Industrial/Technology	0.81	21,170	4,966	Grant County
171015000	598,079	13.7	Light Industrial/Technology	0.81	484,444	113,635	Grant County
171012000	1,231,877	28.3	Light Industrial/Technology	0.81	997,820	234,057	Grant County
110069515	2,761,268	63.4	Light Industrial/Technology	0.81	2,236,627	524,641	Moses Lake
110069516	2,446,765	56.2	Light Industrial/Technology	0.81	1,981,880	464,885	Moses Lake
110069517	736,164	16.9	Light Industrial/Technology	0.81	596,293	139,871	Moses Lake
313388000	378,972	8.7	Light Industrial/Technology	0.81	306,967	72,005	Moses Lake
313389000	324,522	7.5	Light Industrial/Technology	0.81	262,863	61,659	Moses Lake
110866001	123,275	2.8	Light Industrial/Technology	0.81	99,853	23,422	Moses Lake
110866002	1,149,548	26.4	Light Industrial/Technology	0.81	931,134	218,414	Moses Lake
312079000	427,324	9.8	Light Industrial/Technology	0.81	346,132	81,191	Moses Lake
312081000	427,759	9.8	Light Industrial/Technology	0.81	346,485	81,274	Moses Lake
312683000	304,484	7.0	Light Industrial/Technology	0.81	246,632	57,852	Moses Lake
312682000	304,484	7.0	Light Industrial/Technology	0.81	246,632	57,852	Moses Lake
312681000	307,098	7.1	Light Industrial/Technology	0.81	248,749	58,349	Moses Lake
110069513	1,735,430	39.8	Light Industrial/Technology	0.81	1,405,699	329,732	Moses Lake
090629207	916,938	21.1	Light Industrial/Technology	0.81	742,720	174,218	Moses Lake
110069511	5,221,537	119.9	Light Industrial/Technology	0.81	4,229,445	992,092	Moses Lake
120682301							Moses Lake
110069508	2,614,471	60.0	Light Industrial/Technology	0.81	2,117,722	496,750	Moses Lake
	44,656,405	1025.2			37,743,490	6,912,915	

*Estimated size of parcel portion within study boundary

Use	Total Area Sq. Ft.	Total Area Acres	84.52%	Sq. Ft. Imp.	Acres Imp.
Technology	10,426,522	239.36		8,445,482	193.88
Light Industrial	23,002,729	528.07		18,632,211	427.74
Aviation	11,227,154	257.74		10,665,797	244.853

GRANT COUNTY AIRPORT EIS
Employee Projections
Alternative 1

Parcel No.	Gross Square Feet	Gross Acres	Floor Area Ratio	Bldg. Square Feet	Designation	Alternative 1 Assumed Land Use	Mean Sq. Ft. Per Employee	Projected Employees
110069507*	4,296,322.80	98.6	0.25	1,074,081	Heavy Industrial	Heavy industrial	627	1713
170989000*^	3,121,488.00	71.7	0.20	624,298	Aviation Development	FBO(fueling, hangaring, maint.) Special aviation services	750	832
170989000*^	2,292,689.00	52.6			Airport Operations			
171020000*	6,243,912.00	143.3	0.20	1,248,782	Aviation Development	FBO(fueling, hangaring, maint.) Special aviation services	750	1665
171020000*	4,600,699.00	105.6			Airport Operations			
170991000*	1,861,902.00	42.7	0.20	372,380	Aviation Development	FBO(fueling, hangaring, maint.) Special aviation services	750	497
171017000*	1,184,526.00	27.2		-	Airport Operations			
170997000	2,265,120.00	52.0	0.15	339,768	Heavy Industrial	Heavy industrial/warehousing	601	565
170994000	1,477,555.20	33.9	0.15	221,633	Heavy Industrial	Heavy industrial/warehousing	601	369
170988000	161,172.00	3.7	0.15	24,176	Heavy Industrial	Heavy industrial/warehousing	601	40
170987000	174,240.00	4.0	0.00	-	Heavy Industrial	Heavy industrial/warehousing		
170993000	235,224.00	5.4	0.10	23,522	Heavy Industrial	Heavy industrial/warehousing	601	39
171010000	1,328,580.00	30.5	0.10	132,858	Heavy Industrial	Heavy industrial/warehousing	601	221
171018000	1,454,904.00	33.4	0.00	-	Heavy Industrial	Heavy industrial/warehousing		
171014000	26,136.00	0.6	0.00	-	Heavy Industrial	Heavy industrial/warehousing		
171015000	598,078.80	13.7	0.15	89,712	Revenue Support	Heavy industrial/warehousing	601	149
171012000	1,231,876.80	28.3	0.15	184,782	Revenue Support	Heavy industrial/warehousing	601	307
110069515	2,761,268.40	63.4	0.20	552,254	Heavy Industrial	Heavy industrial/warehousing	601	919
110069516	2,446,765.20	56.2	0.20	489,353	Heavy Industrial	Heavy industrial/warehousing	601	814
110069517	736,164.00	16.9	0.20	147,233	Heavy Industrial	Heavy industrial/warehousing	601	245
313388000	378,972.00	8.7	0.20	75,794	Heavy Industrial	Heavy industrial/warehousing	601	126
313389000	324,522.00	7.5	0.20	64,904	Heavy Industrial	Heavy industrial/warehousing	601	108
110866001	123,274.80	2.8	0.20	24,655	Heavy Industrial	Heavy industrial/warehousing	601	41
110866002	1,149,548.40	26.4	0.20	229,910	Heavy Industrial	Heavy industrial/warehousing	601	383
312079000	427,323.60	9.8	0.20	85,465	Heavy Industrial	Heavy industrial/warehousing	601	142
312081000	427,759.20	9.8	0.20	85,552	Heavy Industrial	Heavy industrial/warehousing	601	142
312683000	304,484.40	7.0	0.20	60,897	Heavy Industrial	Heavy industrial/warehousing	601	101
312682000	304,484.40	7.0	0.20	60,897	Heavy Industrial	Heavy industrial/warehousing	601	101
312681000	307,098.00	7.1	0.20	61,420	Heavy Industrial	Heavy industrial/warehousing	601	102
110069513	1,735,430.40	39.8	0.20	347,086	Heavy Industrial	Heavy industrial/warehousing	601	578
090629207	916,938.00	21.1	0.25	229,235	Heavy Industrial	Heavy industrial/warehousing	627	366
110069511	5,221,537.20	119.9	0.25	1,305,384	Heavy Industrial	Heavy industrial/warehousing	627	2,082
120682301	2,047,320.00	47.0	0.20	409,464	Public			
110069508	2,614,471.20	60.0	0.20	522,894	Heavy Industrial	Heavy industrial/warehousing	601	870
	54,781,333.20	1257.6		9,088,388				13519

*Estimated size of parcel portion within study boundary
^Acreage for area west of Taxiway "G" taken from Draft Airport Master Plan (includes 171020000)

Warehousing (30%)	4161
Heavy Industrial (70%)	6364
Aviation Development	2994
	13519

GRANT COUNTY AIRPORT EIS
Employee Projections
Alternative 2

Parcel No.	Gross Square Feet	Gross Acres	Designation	Alternative 2 Assumed Land Use	Floor Area Ratio	Bldg. Square Feet	Mean Sq. Ft. Per Employee	Projected Employees
110069507*	4,296,322.80	98.6	Heavy Industrial	Light Industrial/Technology	0.25	1,074,081	509	2,110
170989000*^	3,121,488.00	71.7	Aviation Development	FBO (non-maintenance/mechanical aviation services)	0.20	624,298	750	832
170989000*^	2,292,689.00	52.6	Airport Operations					
171020000*	6,243,912.00	143.3	Aviation Development	FBO (non-maintenance/mechanical aviation services)	0.20	1,248,782	750	1,665
171020000*	4,600,699.00	105.6	Airport Operations					
170991000*	1,861,902.00	42.7	Aviation Development	FBO (non-maintenance/mechanical aviation services)	0.20	372,380	750	497
171017000*	1,184,526.00	27.2	Airport Operations					
170997000	2,265,120.00	52.0	Heavy Industrial	Light Industrial/Technology	0.15	339,768	509	668
170994000	1,477,555.20	33.9	Heavy Industrial	Light Industrial/Technology	0.15	221,633	509	435
170988000	161,172.00	3.7	Heavy Industrial	Light Industrial/Technology	0.15	24,176	509	47
170987000	174,240.00	4.0	Heavy Industrial	Light Industrial/Technology				
170993000	235,224.00	5.4	Heavy Industrial	Light Industrial/Technology	0.10	23,522	509	46
171010000	1,328,580.00	30.5	Heavy Industrial	Light Industrial/Technology	0.10	132,858	509	261
171018000	1,454,904.00	33.4	Heavy Industrial	Light Industrial/Technology				
171014000	26,136.00	0.6	Heavy Industrial	Light Industrial/Technology				
171015000	598,078.80	13.7	Revenue Support	Light Industrial/Technology	0.30	179,424	466	385
171012000	1,231,876.80	28.3	Revenue Support	Light Industrial/Technology	0.30	369,563	466	793
110069515	2,761,268.40	63.4	Heavy Industrial	Light Industrial/Technology	0.30	828,381	466	1,778
110069516	2,446,765.20	56.2	Heavy Industrial	Light Industrial/Technology	0.30	734,030	466	1,575
110069517	736,164.00	16.9	Heavy Industrial	Light Industrial/Technology	0.30	220,849	466	474
313388000	378,972.00	8.7	Heavy Industrial	Light Industrial/Technology	0.25	94,743	509	186
313389000	324,522.00	7.5	Heavy Industrial	Light Industrial/Technology	0.25	81,131	509	159
110866001	123,274.80	2.8	Heavy Industrial	Light Industrial/Technology	0.25	30,819	509	61
110866002	1,149,548.40	26.4	Heavy Industrial	Light Industrial/Technology	0.25	287,387	509	565
312079000	427,323.60	9.8	Heavy Industrial	Light Industrial/Technology	0.25	106,831	509	210
312081000	427,759.20	9.8	Heavy Industrial	Light Industrial/Technology	0.25	106,940	509	210
312683000	304,484.40	7.0	Heavy Industrial	Light Industrial/Technology	0.25	76,121	509	150
312682000	304,484.40	7.0	Heavy Industrial	Light Industrial/Technology	0.25	76,121	509	150
312681000	307,098.00	7.1	Heavy Industrial	Light Industrial/Technology	0.25	76,775	509	151
110069513	1,735,430.40	39.8	Heavy Industrial	Light Industrial/Technology	0.30	520,629	466	1,117
090629207	916,938.00	21.1	Heavy Industrial	Light Industrial/Technology	0.30	275,081	466	590
110069511	5,221,537.20	119.9	Heavy Industrial	Light Industrial/Technology	0.25	1,305,384	500	2,611
120682301	2,047,320.00	47.0	Public					
110069508	2,614,471.20	60.0	Heavy Industrial	Light Industrial/Technology	0.25	653,618	509	1,284
	54,781,333.20	1257.6				10,085,324		19,010

*Estimated size of parcel portion within study boundary
^Acreage for area west of Taxiway "G" taken from Draft Airport Master Plan (includes 171020000)

Technology	6,712
Light Industrial	9,303
Aviation Development	2,994
	19,010

GRANT COUNTY AIRPORT EIS
Parking Demand
Alternative 1

Parcel No.	Gross Square Feet	Gross Acres	Zoning	Alternative 1 Assumed Land Use	Floor Area Ratio	Bldg. Square Feet	ITE Code	Stalls per 1000 sq.ft.	Estimated Peak Parking Demand	Jurisdiction
110069507*	4,296,323	98.6	Heavy Industrial	Heavy industrial/warehousing	0.25	1,074,081	150	0.51	548	Moses Lake
170989000*^	3,121,488	71.7	Aviation Development	FBO(fueling, hangaring, maint.) Special aviation services	0.33	1,030,091	Estimated	0.5	515	Grant County
170989000*^	2,292,689	52.6	Airport Operations							Grant County
171020000*	6,243,912	143.3	Aviation Development	FBO(fueling, hangaring, maint.) Special aviation services	0.33	2,060,491	Estimated	0.5	1030	Grant County
171020000*	4,600,699	105.6	Airport Operations							Grant County
170991000*	1,861,902	42.7	Aviation Development	FBO(fueling, hangaring, maint.) Special aviation services	0.33	614,428	Estimated	0.5	307	Grant County
171017000*	1,184,526	27.2	Airport Operations							Grant County
170997000	2,265,120	52.0	Heavy Industrial	Heavy industrial/warehousing	0.15	339,768	110	0.75	255	Grant County
170994000	1,477,555	33.9	Heavy Industrial	Heavy industrial/warehousing	0.15	221,633	110	0.75	166	Grant County
170988000	161,172	3.7	Heavy Industrial	Heavy industrial/warehousing	0.15	24,176	110	0.75	18	Grant County
170987000	174,240	4.0	Heavy Industrial	Heavy industrial/warehousing	0.00	-				Grant County
170993000	235,224	5.4	Heavy Industrial	Heavy industrial/warehousing	0.10	23,522	110	0.75	18	Grant County
171010000	1,328,580	30.5	Heavy Industrial	Heavy industrial/warehousing	0.10	132,858	110	0.75	100	Grant County
171018000	1,454,904	33.4	Heavy Industrial	Heavy industrial/warehousing	0.00	-				Grant County
171014000	26,136	0.6	Heavy Industrial	Heavy industrial/warehousing	0.00	-				Grant County
171015000	598,079	13.7	Revenue Support	Heavy industrial/warehousing	0.15	89,712	110	0.75	67	Grant County
171012000	1,231,877	28.3	Revenue Support	Heavy industrial/warehousing	0.15	184,782	110	0.75	139	Grant County
110069515	2,761,268	63.4	Heavy Industrial	Heavy industrial/warehousing	0.20	552,254	110	0.75	414	Moses Lake
110069516	2,446,765	56.2	Heavy Industrial	Heavy industrial/warehousing	0.20	489,353	110	0.75	367	Moses Lake
110069517	736,164	16.9	Heavy Industrial	Heavy industrial/warehousing	0.20	147,233	110	0.75	110	Moses Lake
313388000	378,972	8.7	Heavy Industrial	Heavy industrial/warehousing	0.20	75,794	110	0.75	57	Moses Lake
313389000	324,522	7.5	Heavy Industrial	Heavy industrial/warehousing	0.20	64,904	110	0.75	49	Moses Lake
110866001	123,275	2.8	Heavy Industrial	Heavy industrial/warehousing	0.20	24,655	110	0.75	18	Moses Lake
110866002	1,149,548	26.4	Heavy Industrial	Heavy industrial/warehousing	0.20	229,910	110	0.75	172	Moses Lake
312079000	427,324	9.8	Heavy Industrial	Heavy industrial/warehousing	0.20	85,465	110	0.75	64	Moses Lake
312081000	427,759	9.8	Heavy Industrial	Heavy industrial/warehousing	0.20	85,552	110	0.75	64	Moses Lake
312683000	304,484	7.0	Heavy Industrial	Heavy industrial/warehousing	0.20	60,897	110	0.75	46	Moses Lake
312682000	304,484	7.0	Heavy Industrial	Heavy industrial/warehousing	0.20	60,897	110	0.75	46	Moses Lake
312681000	307,098	7.1	Heavy Industrial	Heavy industrial/warehousing	0.20	61,420	110	0.75	46	Moses Lake
110069513	1,735,430	39.8	Heavy Industrial	Heavy industrial/warehousing	0.20	347,086	110	0.75	260	Moses Lake
090629207	916,938	21.1	Heavy Industrial	Heavy industrial/warehousing	0.25	229,235	150	0.51	117	Moses Lake
110069511	5,221,537	119.9	Heavy Industrial	Heavy industrial/warehousing	0.25	1,305,384	150	0.51	666	Moses Lake
120682301	2,047,320	47.0	Public			-				Moses Lake
110069508	2,614,471	60.0	Heavy Industrial	Heavy industrial/warehousing	0.25	653,618	110	0.75	490	Moses Lake
	54,781,333	1257.6				10,269,197			5602	

*Estimated size of parcel portion within study boundary

GRANT COUNTY AIRPORT EIS
Parking Demand
Alternative 2

Parcel No.	Gross Square Feet	Gross Acres	Zoning	Alternative 2 Assumed Land Use	Floor Area Ratio	Bldg. Square Feet	ITE Code/	Stalls per 1000 sq.ft.	Parking Stalls Required	Jurisdiction
110069507*	4,296,323	98.6	Heavy Industrial	Light Industrial/Light manufacturing	0.25	1,074,081	110	0.75	806	Moses Lake
170989000*^	3,121,488	71.7	Aviation Development	FBO (non-maintenance/mechanical aviation services)	0.33	1,030,091	Estimated	0.6	618	Grant County
170989000*^	2,292,689	52.6	Airport Operations							Grant County
171020000*	6,243,912	143.3	Aviation Development	FBO (non-maintenance/mechanical aviation services)	0.33	2,060,491	Estimated	0.6	1236	Grant County
171020000*	4,600,699	105.6	Airport Operations							Grant County
170991000*	1,861,902	42.7	Aviation Development	FBO (non-maintenance/mechanical aviation services)	0.33	614,428	Estimated	0.6	369	Grant County
171017000*	1,184,526	27.2	Aviation Development	Airport Operations		0			0	Grant County
170997000	2,265,120	52.0	Heavy Industrial	Light Industrial/Technology	0.15	339,768	110	0.75	255	Grant County
170994000	1,477,555	33.9	Heavy Industrial	Light Industrial/Technology	0.15	221,633	110	0.75	166	Grant County
170988000	161,172	3.7	Heavy Industrial	Light Industrial/Technology	0.15	24,176	110	0.75	18	Grant County
170987000	174,240	4.0	Heavy Industrial	Light Industrial/Technology	0.00	0				Grant County
170993000	235,224	5.4	Heavy Industrial	Light Industrial/Technology	0.10	23,522	110	0.75	18	Grant County
171010000	1,328,580	30.5	Heavy Industrial	Light Industrial/Technology	0.10	132,858	110	0.75	100	Grant County
171018000	1,454,904	33.4	Heavy Industrial	Light Industrial/Technology	0.00	0				Grant County
171014000	26,136	0.6	Heavy Industrial	Light Industrial/Technology	0.00	0				Grant County
171015000	598,079	13.7	Revenue Support	Light Industrial/Technology	0.30	179,424	701	2.84	510	Grant County
171012000	1,231,877	28.3	Revenue Support	Light Industrial/Technology	0.30	369,563	701	2.84	1050	Grant County
110069515	2,761,268	63.4	Heavy Industrial	Light Industrial/Technology	0.30	828,381	701	2.84	2353	Moses Lake
110069516	2,446,765	56.2	Heavy Industrial	Light Industrial/Technology	0.30	734,030	701	2.84	2085	Moses Lake
110069517	736,164	16.9	Heavy Industrial	Light Industrial/Technology	0.30	220,849	701	2.84	627	Moses Lake
313388000	378,972	8.7	Heavy Industrial	Light Industrial/Technology	0.25	94,743	110	0.75	71	Moses Lake
313389000	324,522	7.5	Heavy Industrial	Light Industrial/Technology	0.25	81,131	110	0.75	61	Moses Lake
110866001	123,275	2.8	Heavy Industrial	Light Industrial/Technology	0.25	30,819	110	0.75	23	Moses Lake
110866002	1,149,548	26.4	Heavy Industrial	Light Industrial/Technology	0.25	287,387	110	0.75	216	Moses Lake
312079000	427,324	9.8	Heavy Industrial	Light Industrial/Technology	0.25	106,831	110	0.75	80	Moses Lake
312081000	427,759	9.8	Heavy Industrial	Light Industrial/Technology	0.25	106,940	110	0.75	80	Moses Lake
312683000	304,484	7.0	Heavy Industrial	Light Industrial/Technology	0.25	76,121	110	0.75	57	Moses Lake
312682000	304,484	7.0	Heavy Industrial	Light Industrial/Technology	0.25	76,121	110	0.75	57	Moses Lake
312681000	307,098	7.1	Heavy Industrial	Light Industrial/Technology	0.25	76,775	110	0.75	58	Moses Lake
110069513	1,735,430	39.8	Heavy Industrial	Light Industrial/Technology	0.30	520,629	701	2.84	1479	Moses Lake
090629207	916,938	21.1	Heavy Industrial	Light Industrial/Technology	0.30	275,081	701	2.84	781	Moses Lake
110069511	5,221,537	119.9	Heavy Industrial	Light Industrial/Technology	0.25	1,305,384	110	0.75	979	Moses Lake
120682301	2,047,320	47.0	Public			0				Moses Lake
110069508	2,614,471	60.0	Heavy Industrial	Light Industrial/Technology	0.25	653,618	110	0.75	490	Moses Lake
	54,781,333	1257.6				11544873.12			14640	

*Estimated size of parcel portion within study boundary

Appendix F

Air Quality and GHG Report

Air Quality Technical Report
Grant County International Airport
Employment Center Project
Grant County, Washington

June 17, 2015

Prepared for

EA Engineering, Science, and Technology, Inc., PBC
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Seattle, Washington 98121

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APPENDICES

1.0 INTRODUCTION

This report has been prepared for EA Engineering, Science, and Technology, Inc., PBC (EA) and provides background information and analysis to support the preparation of the Air Quality section of the Draft Environmental Impact Statement (DEIS) for development of the Grant County International Airport Employment Center (Site; project area) project in Grant County, Washington (Figure 1). The Port of Moses Lake (Port) is preparing a Planned Action EIS for approximately 1,258 acres located to the east of Grant County International Airport in the Port, the City of Moses Lake and Grant County. The County and Port will act as the SEPA co-lead agencies, with EA contracting directly with the Port. The project area is shown on Figure 2.

The following sections describe the current air quality conditions in the region, existing regulations and policies that govern allowable air pollutant emissions, and existing regulations and policies that have been developed to reduce greenhouse gas (GHG) emissions. Impacts of the alternatives (Alternative 1: Heavy Manufacturing/Warehouse Emphasis; Alternative 2: Light Manufacturing/ Technology Emphasis; and Alternative 3: No Action) are analyzed at a programmatic level. This report also provides a screening-level forecast of GHG emission rates that would be generated by each of the alternatives.

Current air quality regulations should prevent new developments and commercial facilities within the project area from generating unacceptable air pollutant emissions that would affect nearby areas during construction or operation. Project-related air pollutant emissions are expected to increase for both Alternatives 1 and 2, while Alternative 3 (No Action) would be similar to existing conditions (i.e., no growth or development). Alternatives 1 and 2 would generate air pollutant emissions during construction and afterward due to facility operations; however, it is unlikely that either of the action alternatives would significantly affect regional air quality as construction emissions would be temporary and localized and regulations would require future business operations to limit emissions to acceptable thresholds.

1.1 PROPOSED PROJECT ALTERNATIVES

Alternative 1 is focused on heavy manufacturing and warehousing, and Alternative 2 is focused on light manufacturing and technology. Alternative 3 assumes no development at the Site. The proposed alternatives are summarized in Tables 1 and 2.

2.0 AFFECTED ENVIRONMENT

2.1 KEY CRITERIA AIR POLLUTANTS

The following sections describe the sources and environmental effects of key criteria air pollutants considered in this analysis.

2.1.1 CARBON MONOXIDE

Carbon monoxide (CO) is a product of incomplete combustion generated by mobile sources, residential wood combustion, and industrial fuel-burning sources. CO is a pollutant of concern related to on-road mobile sources because it is the pollutant emitted in the greatest quantity for which short-term health standards exist. CO is a pollutant with impacts that are usually localized, and CO concentrations typically diminish within a short distance from the emission source. The highest ambient concentrations of CO usually occur near congested traffic roadways and intersections during wintertime periods of air stagnation.

2.1.2 OZONE

Ozone is a highly reactive form of oxygen that is generated by an atmospheric chemical reaction with nitrogen oxides (NO_x) and volatile organic compounds (VOCs), also known as ozone precursors. These precursors are emitted directly from industrial and mobile sources. Transportation equipment such as automobiles and trucks also significantly contribute to ozone precursor emissions. Ozone impacts are regional because the atmospheric reactions take time, and during this delay, the precursor chemicals may disperse far from their point of emission.

2.1.3 PARTICULATE MATTER

Ambient particulate matter (PM) is generated by industrial sources, residential wood combustion, motor vehicle tailpipes, and fugitive dust from roadways, haul roads, and unpaved surfaces. Limits on particle pollution, when first regulated, were based on total suspended particulates, regardless of particulate size. As sampling technology has improved and information on chemical composition has become more clear, as well as information of health impacts related to particle size has been refined, ambient standards have been revised to focus on the more critical particle size fractions that are associated with human health effects. In some cases, fine PM may have additional inhalation risk by aiding transport of other toxic substances (pollutants that have adhered to the particle's surface) deep to human lung tissue.

Currently, ambient air quality standards are set for particulate matter less than or equal to 10 micrometers in size (PM_{10}) and particulate matter less than or equal to 2.5 micrometers in size ($PM_{2.5}$)

because these groups of particles are found to most significantly impact human health and regional haze. The greatest ambient concentrations of PM generally occur near the point of emission, which in most cases would be near the unpaved roads (as fugitive dust is stirred into the air) and paved roads (from motor vehicle tailpipes). $PM_{2.5}$ emissions have greater impact on ambient air quality than PM_{10} at locations farther from the emitting source because it remains suspended in the atmosphere longer and travels farther.

2.1.4 Lead

Historically, the main source of lead pollution has been from the transportation sector, but lead emissions from tailpipes have drastically declined since the U.S. Environmental Protection Agency (EPA) implemented regulatory efforts to remove lead from on-road motor vehicle gasoline. Currently, the major emission sources of lead are considered to come from lead smelters and metal processing plants or the combustion of aviation fuel. One major industrial facility, REC Silicon, is established in Moses Lake and primarily smelts and refines non-ferrous metals (including lead); however, REC Silicon is approximately 5.5 miles southeast of the project area and is likely outside of the ambient air dispersion domain that would experience significant lead impacts from that facility.

2.1.5 Nitrogen Oxides and Sulfur Oxides

Nitrogen oxides (NO_x) and sulfur oxides (SO_x) are emitted by fuel-burning mobile and stationary sources. NO_x and SO_x pollution forms regional haze and may generate acid deposition. Ambient concentrations of these pollutants within Grant County are below the National Ambient Air Quality Standard (NAAQS) limits due to the rural nature of the county and the stringent air quality regulations that limit emissions from nearby industrial facilities. NO_x from regional tailpipe emissions is one of the ozone precursors that additionally contribute to ozone issues.

2.1.6 Existing Grant County Criteria Air Pollutant Emissions

An air emissions inventory is an accounting of the amount of air pollution emitted by various sources. Every year, the Washington State Department of Ecology (Ecology) prepares an inventory of air contaminant emissions for facilities with air operating permits (major sources emit 100 tons or more per year of any single criteria pollutant, 10 tons or more per year of any hazardous or toxic air pollutant, or 25 tons or more per year of combined hazardous air pollutants). Additionally, every 3 years, Ecology inventories "non-point" sources, including motor vehicles, wood stoves, outdoor burning, agriculture, and natural sources. The most recently completed non-point inventory is documented in a report titled Washington State *2011 County Emissions Inventory* (Ecology website 2014a). The results for Grant County are provided in Table 3.

As shown in Table 3, among several types of point and non-point sources, on-road mobile sources (automobiles and trucks) contributed to the highest portion of CO, NO_x, and SO_2 at 62 percent, 57 percent, and 28 percent of the total countywide emissions, respectively. In Grant County, the dominant source of particulate emissions (PM_{10} and $PM_{2.5}$) is attributed to agricultural tilling and harvesting. The largest inventoried source of VOCs was listed as natural emissions from soil and vegetation; however, anthropogenic, commercial, and consumer solvents contributed to nearly 20 percent of the total VOC emissions recorded in 2011 from Grant County.

2.2 AMBIENT AIR QUALITY REGULATIONS

Two agencies have jurisdiction over ambient air quality in the project area, the EPA and Ecology. The EPA established NAAQS for the six criteria air pollutants and specified deadlines for which states are to develop and implement plans to comply. The NAAQS are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life. Ecology established the Washington State Ambient Air Quality Standards (WAAQS) for the same six criteria air pollutants that are at least as stringent as the national standards. Table 4 lists the ambient air quality standards for the six criteria pollutants: CO, ozone, PM_{10}/$PM_{2.5}$, lead, nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Ecology is responsible for issuing air quality permits to industrial and commercial facilities that emit substantial amounts of air pollutants.

Based on monitoring information collected over a period of years, the EPA and Ecology designate regions of "non-attainment" for regulated air pollutants. Non-attainment status indicates that the regional air quality does not meet the NAAQS. A region is considered in "attainment" when the air pollutant levels within that area are consistently below the NAAQS. If the measured concentrations in a non-attainment area improve so that they are consistently below the NAAQS, the area may be reclassified as a "maintenance area." As of January 30, 2015, the EPA considers Grant County in an attainment area (EPA website 2015a).

2.3 AIR TOXICS ISSUES

Four existing facilities (T K Holdings Inc., Moses Lake Industries Inc., Terex-Genie Industries, and SGL Automotive Carbon Fibers) operate within 1 mile of the project area and are required to report all onsite discharges (including air emissions from confined air streams, such as stacks, ducts, or pipes; fugitive release from equipment leaks and building ventilation systems; and evaporative losses from surface impoundments or spills) of toxic air pollutants to the EPA's Toxic Release Inventory (TRI) Program (EPA website 2015b,c,d,e).

Each of these four sites is a "minor source" facility (i.e., they emit less than the "major source" threshold values discussed previously) and is required to develop a pollution prevention program that includes management of all toxic releases (EPA 2012). Additionally, the Washington Clean Air Act requires these facilities to undergo new source review for all construction or modifications (including operational change) that would cause an increase in emissions of toxic air pollutants that exceed exemption threshold levels (i.e., *de minimis* emission rates) specified in Washington Administrative Code (WAC) 173-460-150. Ecology also requires these facilities to use best available control technology (BACT) for toxic air pollutants on stationary equipment to minimize emissions. If toxic air pollutant impacts are expected to exceed Washington acceptable source impact levels, Ecology will approve the project only if impacts to human health are demonstrated to be below acceptable thresholds. Although air quality in the project area could be affected by minor to moderate concentrations of toxic air pollutants from these facilities, significant impacts are unlikely due to the regulatory framework enforced by Ecology.

The project area is currently composed of establishments for airport use—including aircraft hangars, office space, and vacant space—that pose no special issues related to air toxics. However, aircraft operations at Grant County International Airport could result in minor to moderate amounts of toxic air pollutant emissions due to the combustion of aviation fuel. Other non-aircraft-related operations that could generate minor amounts of toxic air pollutant emissions by fuel combustion include passenger travel to the airport by cars, trucks, and buses, and tarmac vehicles such as airplane tugs, baggage vehicles, and fuel tankers (Transportation Resource Board 2009). Therefore, it is expected that air quality in the project area adjacent to major roadways could be affected by minor to moderate concentrations of toxic air pollutants.

It is expected that existing and future air quality in the project area could be affected by the emission sources described above. However, according to the EPA's National Air Toxics Assessment 2005 database (EPA website 2014a), the existing respiratory cancer risk in the census tract that includes the project area is approximately 20 per million (i.e., about 20 excess cancer cases per million people exposed over an entire lifetime), which is typical of other rural areas in Washington state, but far less than the respiratory cancer risk in some urban areas of Washington, which can exceed 500 excess cancer cases per million exposed.

2.4 OUTDOOR BURNING

Burning of even simple, unprocessed, natural material (i.e., yard waste and land debris) emits harmful pollutants such as CO and fine particles. Ecology enforces state outdoor burning regulations required by the Revised Code of Washington (RCW) 70.94.743. Burning yard waste and land-clearing debris is not allowed at any time in Moses Lake. Some rural areas of Grant County will allow residential burning (lawn and garden debris), recreational campfires, and agricultural burning (with permit) (Ecology 2008a).

2.5 GREENHOUSE GASES

GHGs are a group of gases that, when present in the atmosphere, absorb or reflect heat that normally would radiate away from the earth and thereby increases global temperature. Several GHG constituents are commonly evaluated, including carbon dioxide (CO_2), methane, nitrous oxide, water vapor, ozone, and halocarbons. Each individual constituent has its own global warming potential but CO_2 is the GHG that is normally emitted in the greatest amount and recognized to contribute most to climate change. To express the average emission rate and global warming potential of these combined GHG constituents, emission rates are commonly expressed as the equivalent amount of carbon dioxide (CO_2e).

2.5.1 GLOBAL CLIMATE CHANGE

Extensive international scientific research on human-induced accumulation of GHG emissions affecting global climate change has now spanned several decades. There is a broad consensus among the worldwide scientific community that anthropogenic emissions have measurably impacted global temperatures and will continue to deleteriously affect climate change. As a result, the Kyoto Protocol is one of the first examples of international recognition of global warming and cooperation to globally mitigate human GHG emissions.

Climate change is a global problem influenced by an array of interrelated factors that have concrete consequences for the Pacific Northwest. A 2009 report by the University of Washington's Climate Impacts Group found that climate change will significantly challenge the region's natural and built systems (Climate Impacts Group website 2009). Changes in temperature and climate are expected to have a dramatic impact on plants and animals currently adapted to conditions that will no longer prevail.

The vast majority of worldwide emissions are beyond the scope of control for this project. In general, no single entity emits enough GHGs to solely influence global climate change but cumulatively contributes to global warming through GHG emissions. Therefore, implementing reductions in GHG emissions demonstrates leadership to mitigate human impacts on global warming and to adapt to future climate change.

2.5.2 NATIONAL ENVIRONMENTAL POLICY ACT REQUIREMENT FOR CLIMATE CHANGE ANALYSIS

On December 7, 2009, the EPA signed the Endangerment and Cause or Contribute Findings for GHGs under Section 202(a) of the federal Clean Air Act (EPA 2009). Under the Endangerment Finding, the EPA determined that the current and projected concentrations of the six key, well-mixed GHGs (CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations. Under the Cause or Contribute

Finding, the EPA determined that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG emissions that threaten public health and welfare. These findings did not set requirements on industry or other entities but through collaboration with the National Highway Traffic Safety Administration, the EPA finalized emission standards in May 2010 for light-duty vehicles (2012 to 2016 model years) and August 2011 for heavy-duty vehicles (2014 to 2018 model years) (EPA website 2013).

On February 18, 2010, the Council on Environmental Quality issued a draft National Environmental Policy Act (NEPA) guidance document on the consideration of the effects of climate change and GHG emissions (CEQ 2010). This guidance document advises federal agencies to consider opportunities to reduce GHG emissions caused by federal actions, adapt their actions to climate change impacts throughout the NEPA process, and address these issues in their agency NEPA procedures. Where applicable, the scope of the NEPA analysis should cover the GHG emission effects of a proposed action and alternatives, and the relationship of climate change effects to a proposed action or alternatives. This guidance document does not set numerical thresholds for what level of GHG emissions would constitute a significant impact, nor does it specify what types of mitigation measures should be required. This guidance document does advise that when determining the effects of climate change on a proposed action, an agency should start with an identification of the future condition of the affected environment for the "no action" alternative, which should serve as the basis for evaluating and comparing the incremental effects of other action alternatives. However, this method has no standing for State Environmental Policy Act (SEPA) reviews.

2.5.3 State of Washington Greenhouse Gas Requirements

In response to growing worldwide concerns, then-Washington State Governor Christine Gregoire issued Executive Order 07-02 in February 2007. The executive order established the following GHG emission reduction goals (Washington State Office of the Governor 2007):

- Reduce emissions to 1990 levels by 2020, 25 percent below 1990 levels by 2035, and 50 percent below 1990 levels by 2050.
- Increase "green economy jobs" to 25,000. The term "green economy jobs" means the design, manufacture, marketing, and installation of equipment to support sustainable development both within and beyond Washington State.
- Reduce expenditures on fuel imported into Washington State by 20 percent by 2020.

The above-noted GHG reduction goals apply state-wide, but they do not specify any requirements for local government agencies to implement measures to reduce emissions within their local jurisdictions.

The Washington Legislature enacted into state law Chapter 70.235 RCW, which limits greenhouse gas emissions. This law codifies the GHG reduction goals of Executive Order 07-02 and distinguishes them as “limits” rather than “goals.” The legislature also added a fourth requirement to help achieve the GHG reduction targets (RCW 47.01440):

- Decrease the annual per capita vehicle miles traveled by 18 percent by 2020, 30 percent by 2035, and 50 percent by 2050.

This applies only to actions taken by Washington State agencies and local governments that receive state funds for their projects. State regulations on GHG emissions include prerequisites for distribution of capital funds for infrastructure and economic development projects, where projects receiving funding must be evaluated for consistency with state and federal GHG limits and state vehicle miles traveled (VMT) goals (RCW 20.235.070).

In 2010, Ecology issued guidance for SEPA reviews related to GHG emissions for SEPA actions for which a local government agency is the SEPA lead agency (Ecology website 2013). That guidance document required that all SEPA reviews evaluate GHG emissions. The guidance document presented a range of ways that local agencies could set significance thresholds, calculate GHG emissions, and potentially mitigate those emissions. However, the guidance document did not stipulate a significance threshold for GHG emissions, nor did it specify what level of GHG emission reduction is required under SEPA. The guidance document emphasized that those decisions must be made by the SEPA lead agency on a case-by-case basis.

Ecology issued revised GHG guidance in June 2011 for SEPA reviews regarding actions where Ecology is the SEPA lead agency (Ecology website 2011). This guidance document is applicable only to projects where Ecology is the lead agency or agency with jurisdiction. Ecology’s 2011 guidance for Ecology-led SEPA determinations sets the SEPA significance threshold to 25,000 metric tons per year of GHG emissions or a mitigation plan that anticipates 11 percent reduction on that GHG emission increase. The 2011 Ecology guidelines do not specify significance thresholds or mitigation requirements for local governmental actions for which the local agency is the SEPA lead agency. Regardless, Ecology’s recommendation for mitigation illustrates the importance of local actions to reduce GHG emissions.

In 2011, the Washington State Department of Commerce released an updated Washington State Energy Strategy for 2012 (DOC website 2011), which included short- and long-term policy options to meet the following goals:

- Maintain competitive energy prices that are fair and reasonable for consumers and businesses and support Washington’s continued economic success
- Increase competitiveness by fostering a clean energy economy and jobs through business and workforce development
- Meet the state’s obligations to reduce GHG emissions.

The Washington State Energy Strategy outlines strategies to meet these goals in the categories of transportation efficiency, building efficiency, distributed energy, and pricing.

Since 2007, Ecology has released a state-wide GHG emissions inventory comparing data from 1990, 2000, and 2005 through 2010 and demonstrated that transportation has been consistently the most significant GHG emission contributor. Between 2008 and 2010, the transportation sector contributed a level of GHG approximately equal to the combined emissions of residential/commercial/industrial and electricity sources within the state. One significant sector trend showed a decrease in GHG emissions from generation of electricity, which was attributable to an increase in wind and hydroelectric power generation between 2005 and 2010 (Ecology website 2010).

2.5.4 WASHINGTON GREENHOUSE GAS EMISSIONS

A state-wide Comprehensive Emission Inventory (2008) of GHG was published in Ecology's 2010 Climate Comprehensive Plan titled "Path to a Low-Carbon Economy" (Ecology 2010). This statewide Comprehensive Plan forecast GHG emissions for both 2015 and 2035. The forecast values are summarized in Table 5 and show statewide GHG emission projections for all source categories estimated at 102.7 and 114.2 million metric tons CO_2e ($MMTCO_2e$) in 2015 and 2035, respectively (Ecology website 2014b).

3.0 IMPACTS

3.1 METHODOLOGY

This section describes the methods used for estimating projected GHG emissions for each alternative.

3.1.1 GREENHOUSE GAS EMISSION CALCULATION METHODS

This analysis provides a screening-level estimate of life-cycle “business as usual” GHG emissions for the project area, not including individual large stationary industrial sources or any special project-level emission reduction measures or other mitigation measures.

For this analysis, GHG emissions are expressed as metric tons CO_2e ($MTCO_2e$) to account for the combined global warming potential caused by the most common GHG constituents (CO_2, methane, nitrous oxide, etc.). For purposes of comparing alternatives and determining significance, forecast GHG emission increases are based on comparing the future emission rates for the action alternatives (Alternatives 1 and 2) to the forecast future emission rate of the no action alternative (Alternative 3).

The SEPA GHG Calculation Tool [available through the Ecology ”Guidance Document Including GHG emission in SEPA Reviews” (Ecology website 2013)] was used for this analysis to evaluate existing and predict future (for the year 2035) GHG emissions for each alternative. In general, the calculation tool uses nationally averaged energy consumption data. The available input data used for the GHG emission calculations are limited to aggregate square footages for commercial, institutional, and industrial land development, and aggregate housing units for single- and multi-family housing. Given those input limitations, this tool is considered an adequate screening-level method for the purpose of forecasting GHG emission rates.

The following life-cycle emissions were estimated using the SEPA GHG Calculation Tool:

- Energy emissions are generated by stationary combustion (i.e., furnace combustion of natural gas for space heating) and electricity consumption throughout the lifespan of a building. These emission estimates are based on the U.S. Energy Information Administration’s residential and commercial energy consumption surveys.
- Transportation emissions include tailpipe emissions generated by on-road vehicles used by particular building occupants. This evaluation not only accounts for transportation emissions for the employees working at facilities under commercial and industrial land use categories, but also for delivery trucks carrying goods to or from the buildings and vehicle travel by customers at commercial or industrial areas. For example, a building related to commercial grocery stores or malls would have much more customer-related and delivery vehicle travel than would a dental office. However, the transportation emissions do not account for vehicles passing through the project area unless the purpose of travel would be directly associated with the businesses within the project area.

- For projections of 2035 transportation emissions, the calculation tool default value for the average fuel economy was increased to 54.5 miles per gallon (mpg) to reflect the EPA's corporate automobile fuel economy vehicle mileage standard for 2025. For analysis of existing conditions, the calculation tool's default fuel economy of 20.8 mpg for average passenger vehicles (based on Bureau of Transportation Statistics' national data) was not changed.

3.1.2 Land Use Values Used for Air Quality and Greenhouse Gas Assessment

This analysis considered future land use growth and GHG emissions increases in the project area. Alternative 1 would allow development of heavy manufacturing and warehousing uses within the project area, including (but not limited to) machine shop/welding, manufacturing assembly and processing, heavy construction equipment storage/sales, and aviation development. Alternative 2 would allow development of light manufacturing and technology-based industry, including (but not limited to) light industrial, light manufacturing, technological laboratories, research and test facilities, flight-training vocational schools, and specialized aviation service operations and aircraft equipment sales. Alternative 3 would be a continuation of existing conditions with no new development or growth. For the purposes of calculating GHG emissions for this screening-level programmatic analysis, all of the forecast commercial/industrial space was aggregated into the following land use categories: light industrial, manufacturing, warehousing, and office space.

Table 6 lists the land use values that were used to assess project GHG emissions for existing conditions and each alternative.

3.1.3 Soil Carbon Emissions from Permanent Removal or Restoration of Biomass

Alternatives 1 and 2 would increase impervious surface area and result in permanent removal of biomass (e.g., grass, shrubs, trees, etc.). The general term "soil carbon GHG emissions" refers to the effect of permanently removing existing vegetation for the purpose of constructing new development. This would exacerbate global climate change through two mechanisms. First, the existing biomass consisting of aboveground vegetation and underground root mass is immediately removed and disposed of. This biomass will decay and emit CO_2 to the atmosphere. Second, the aboveground vegetation is no longer available to sequester CO_2 from the atmosphere during natural photosynthesis. Similarly, the restoration and replanting of vegetation in areas that have already been cleared of vegetation is a way to recapture carbon, to store it within the plant structure, and release oxygen to the atmosphere.

The resultant "soil carbon" GHG emission rates for each alternative were estimated using the calculation tool developed by Build Carbon Neutral (Build Carbon Neutral website 2014), which queries for acreage of disturbed vegetation type that is removed or replanted, and outputs an annualized GHG emission rate. The project site evaluated in this analysis is located on the Columbia Plateau, a cold-desert region, and the disturbed landscape was evaluated as "North American desert, shrubland." For this analysis, it was assumed that all disturbed vegetation will be permanently removed (no replacement or installed vegetation).

3.2 IMPACTS COMMON TO ALL ALTERNATIVES

3.2.1 CONSTRUCTION IMPACTS

During construction, fugitive dust from excavation and grading may temporarily cause a localized ambient concentration increase of particulate matter (PM_{10} and $PM_{2.5}$). Construction activities would likely require the use of diesel-powered, heavy trucks and smaller equipment such as generators and compressors. These engines would emit air pollutants that could slightly degrade local air quality in the immediate vicinity of the activity. However, these emissions would be temporary and localized, and the resulting construction tailpipe emissions would likely be exceeded by emissions from existing pollution sources surrounding the project area.

Some construction activities could cause odors detectable to some people in the vicinity of that activity, especially during paving operations that use tar and asphalt. Such odors would also be localized and short-term. Slash burning is not permitted in association with construction activities.

Construction equipment and material hauling might temporarily cause traffic delays on streets adjacent to a construction area. If such delays increase traffic flow enough to reduce travel speeds by a significant amount, general traffic-related emissions could increase.

3.2.2 LOCALIZED TRANSPORTATION IMPACTS AT CONGESTED INTERSECTIONS

Under any of the alternatives, localized CO impacts could occur at major intersections that experience significant traffic congestion. Ongoing EPA motor vehicle regulations have caused steady decreases in tailpipe emissions of CO from individual vehicles and exceedances of the NAAQS limits for CO are, nowadays, extremely rare even at the most heavily congested downtown intersections within the State of Washington. Therefore, it is unlikely that air quality impacts at local intersections would be significant.

3.2.3 EMISSIONS FROM FUTURE BUSINESS OPERATIONS

Under all of the alternatives, the project area is expected to experience air quality impacts due to business operations. The nature of the air quality impacts will depend on the type of business that is operated, but could include emissions of criteria pollutants, toxic air pollutants, or other non-toxic odor-producing emissions from stationary or mobile sources. Unless properly controlled, air pollutant-emitting equipment and trucks at loading docks could contribute to air pollution in the vicinity. Air quality impacts from future business operations are likely to be greater under Alternative 1 due to the focus on heavy manufacturing, which is more likely to have pollutant-emitting industrial equipment than the light industrial development that would be associated with Alternative 2. Additionally, Alternative 1 would focus on warehouse uses, which would result in greater mobile source air emissions than Alternative 2 due to the likelihood of greater VMT (longer distances) by heavy-duty distribution trucks.

However, large stationary air pollutant-emitting industrial equipment must be registered and permitted with Ecology. Ecology requires all commercial and industrial facilities to use BACT on stationary equipment to minimize emissions. BACT for stationary industrial equipment could include (but is not limited to) a requirement to install wet scrubbers or baghouses to control PM emissions, oxidation technologies to control VOCs or other toxic air pollutants, combustion controls to reduce NO_x and CO, and a requirement to use fuels with low sulfur content. The agency may require an applicant with high emissions to conduct an air quality assessment to demonstrate that the proposed emissions would not expose offsite areas to ambient pollutant concentrations that exceed regulatory limits. Additionally, EPA on-road emissions standards for new heavy trucks require the use of selective catalytic reduction to control NO_x emissions and diesel particulate filters to control PM emissions. Therefore, it is unlikely that new business development would cause significant air quality issues.

3.2.4 Indirect and Cumulative Impacts

3.2.4.1 Mobile Source Air Toxics

Future development might require future improvements to existing roadways. In some cases, when a street is widened tailpipe emissions move closer to nearby human receptors and the localized level of mobile source air toxic (MSAT) emission impacts become greater than before. However, reductions in congestion associated with an improved traffic plan may help offset the potential for such localized increases in MSAT impacts. Furthermore, over time and on a regional basis, the EPA's vehicle and fuel regulations (coupled with ongoing future fleet turnover) should significantly reduce ambient MSAT levels.

3.2.4.2 Regional Emissions from Vehicle Travel

In general, regional photochemical smog issues are caused largely by tailpipe emissions from cars and trucks traveling on public streets. For this analysis, it was assumed that the relative amounts of regional tailpipe emissions caused by each alternative would be proportional to the regional VMT caused by each alternative. Both action Alternatives 1 and 2 would increase regional VMT, which would contribute to tailpipe emissions throughout Grant County. When added to the forecast population and economic growth throughout the county, the increased emissions caused by development in the project area may slightly contribute to future worsening of regional air quality.

Tailpipe emissions from vehicles traveling on public streets are one of the largest sources of air pollutant emissions associated with growth in the study area. However, ongoing EPA emission control requirements for on-road cars and trucks have dramatically improved per-vehicle tailpipe emission rates. That beneficial trend is expected to continue into the future as drivers gradually replace old vehicles with new, clean-burning ones. As a result, the decrease in future per-vehicle emission rates might offset the forecast increase from project-related growth in VMT. In such a case, ambient air quality impacts from on-road vehicles would remain approximately the same as existing levels, or even gradually decrease compared to existing levels.

3.3 ALTERNATIVE 1: HEAVY MANUFACTURING/WAREHOUSE EMPHASIS

This section describes impacts specific to Alternative 1.

3.3.1 CALCULATED GREENHOUSE GAS EMISSIONS

Table 6 lists the forecast project area land uses that were used for calculating GHG emissions for Alternative 1. The values listed under "existing" represent current conditions. The values listed for each alternative represent the net increase compared to current conditions. Table 7 lists the results of this analysis and sums the total GHG emissions estimated from both the "SEPA GHG Calculation Tool" and Build Carbon Neutral "soil carbon" program.

Development under Alternative 1 would emphasize heavy manufacturing and warehouse installation. Alternative 1 would disturb a greater surface area than Alternative 2 for increased "soil carbon" emissions. The energy emissions related to building heating/cooling and power is less demanding for manufacturing/warehousing (Alternative 1) than for light industrial/office space (Alternative 2). Thus, Alternative 1 would result in less energy-related GHG emissions. Additionally, warehousing use is assumed to have fewer vehicle trips per buildable square foot but the VMT per trip is expected to be greater because trucks transporting goods that are coming to/from the warehouses are expected to travel longer distances than vehicles traveling to/from non-warehousing uses. Therefore, the anticipated GHG emission estimate attributed to transportation is slightly higher for Alternative 1 than for Alternative 2. GHG calculation backup documentation is provided in Appendix A.

As shown in Table 7, the projected GHG emissions increase for Alternative 1, above future no action (Alternative 3), is expected to be approximately 416,788 $MTCO_2e$ per year. Total GHG emissions for Washington State were forecast to be about 114,100,000 $MTCO_2e$ per year in 2035 (Ecology website 2010). In comparison to state-wide annual GHG emissions, the increase for Alternative 1 is not considered significant, as no single project emits enough GHGs to solely influence global climate change.

3.4 ALTERNATIVE 2: LIGHT MANUFACTURING/TECHNOLOGY EMPHASIS

This section describes impacts specific to Alternative 2.

3.4.1 CALCULATED GREENHOUSE GAS EMISSIONS

Table 6 lists the forecast project area land uses that were used for calculating GHG emissions for Alternative 2. Table 7 lists the annual GHG emission increases expected from future development under Alternative 2. Alternative 2 would emphasize technological business development (non-medical office space) and light manufacturing. Energy consumption, including stationary combustion to heat and cool buildings, is expected to be highest for Alternative 2 among all the alternatives studied in this analysis.

Alternative 2 would generate more jobs and therefore more employee commute VMT than Alternative 1. However, the vehicle miles per trip are anticipated to be fewer for Alternative 2 due to the nature of those trips (i.e., employees commuting to work from their nearby residences) compared to Alternative 1, which would have more warehousing uses with goods being transported over long distances. Therefore, transportation-related GHG emissions for Alternative 2 are expected to be less than for Alternative 1, but more than Alternative 3. GHG calculation backup documentation is provided in Appendix A.

As shown in Table 7, the projected GHG emissions increase for Alternative 2, above future no action (Alternative 3), is expected to be 406,553 $MTCO_2e$ per year, which would be a slightly lower impact than for Alternative 1. Total GHG emissions for Washington State were forecast to be about 114,100,000 $MTCO_2e$ per year in 2035 (Ecology website 2010). In comparison to state-wide annual GHG emissions, the increase for Alternative 2 is not considered significant, as no single project emits enough GHGs to solely influence global climate change.

3.5 ALTERNATIVE 3: NO ACTION

Alternative 3 assumes continued use of the project area as it currently exists with no additional growth or development. Alternative 3 could entail repair, remodeling, and replacement of the existing buildings.

4.0 MITIGATION MEASURES

4.1 CONSTRUCTION EMISSIONS CONTROL

During development, construction contractors could be required to implement air quality control plans for construction activities in the project area. All future developers could be required to prepare a dust control plan that commits the construction crews to implementing all reasonable control measures described in the 1997 guidebook titled *Guide to Handling Fugitive Dust from Construction Projects*, prepared by Associated General Contractors of Washington Education Foundation and the Fugitive Dust Task Force, which is distributed by Ecology. The air quality control plans should include best management practices (BMPs) to control fugitive dust and odors emitted by diesel-fired construction equipment.

The following BMPs could be used to control fugitive dust.

- Use water sprays or other non-toxic dust control methods on unpaved roadways
- Minimize vehicle speed while traveling on unpaved surfaces
- Prevent track-out of mud onto public streets
- Cover soil piles when practical
- Minimize work during periods of high winds when practical.

The following mitigation measures could be used to minimize air quality and odor issues caused by tailpipe emissions.

- Maintain the engines of construction equipment according to manufacturers' specifications
- Minimize idling of equipment while the equipment is not in use.

If there is regular heavy traffic during some periods of the day, scheduling haul traffic during off-peak times (e.g., between 9:00 a.m. and 4:00 p.m.) would have the least effect on traffic and would mitigate indirect increases in traffic-related emissions.

Burning of slash or demolition debris will not be permitted without express approval from Ecology. No slash burning is anticipated for any construction projects in the project area.

4.2 CRITERIA OR TOXIC AIR POLLUTANT EMISSION REDUCTION MEASURES

Ecology would require any future development that could potentially cause an increase of criteria or toxic air pollutant emissions that exceed exemption threshold levels specified in WAC 173-400-110 or WAC 173-460-150 to obtain a Notice of Construction Approval Order prior to construction and to use BACT on stationary equipment to minimize emissions.

4.3 GREENHOUSE GAS REDUCTION MEASURES

Washington State has established GHG reduction goals with targets for 2020 (1990 levels), 2035 (20 percent reduction below 1990 levels) and 2050 (50 percent reduction below 1990 levels), and adopted requirements for capital investments, an energy strategy, and VMT reduction targets. However, neither Ecology nor the EPA has adopted numerical GHG emission standards, GHG reduction requirements, or numerical GHG significance thresholds that provide direction for local government land use development actions. Therefore, it is the local agency's responsibility to implement GHG reduction requirements for new developments.

As part of the proposed planned action under consideration, the local agency could require or encourage future developers to implement additional trip-reduction and energy conservation measures that could provide even greater GHG reductions. GHG emission reductions could be achieved by using building design and construction methods to use recycled construction materials, reduce space heating and electricity usage, incorporate renewable energy sources, and reduce water consumption and waste generation.

Table 8 lists a variety of mitigation measures that could reduce GHG emissions caused by transportation facilities, building construction, space heating, and electricity usage (Ecology 2008b). The table lists potential GHG reduction measures and indicates where the emission reductions might occur. Development applicants could be required to consider the reduction measures shown in Table 8 for their projects. Local agencies can incorporate potential GHG reduction measures through its goals, policies, or regulations.

5.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Temporary, localized dust and odor impacts could occur during the construction activities. Additionally, GHG, odor, criteria and toxic air pollutant increases could occur from future business operations. The regulations and mitigation measures described above are adequate to mitigate any adverse impacts that may be anticipated to occur as result of project area growth and development. Therefore, no significant, unavoidable, adverse impacts to regional or local air quality are expected.

6.0 USE OF THIS REPORT

This air quality analysis report has been prepared for the exclusive use of EA Engineering Science & Technology Inc. for specific application to the draft Environmental Impact Statement for the Grant County International Airport Employment Center project. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

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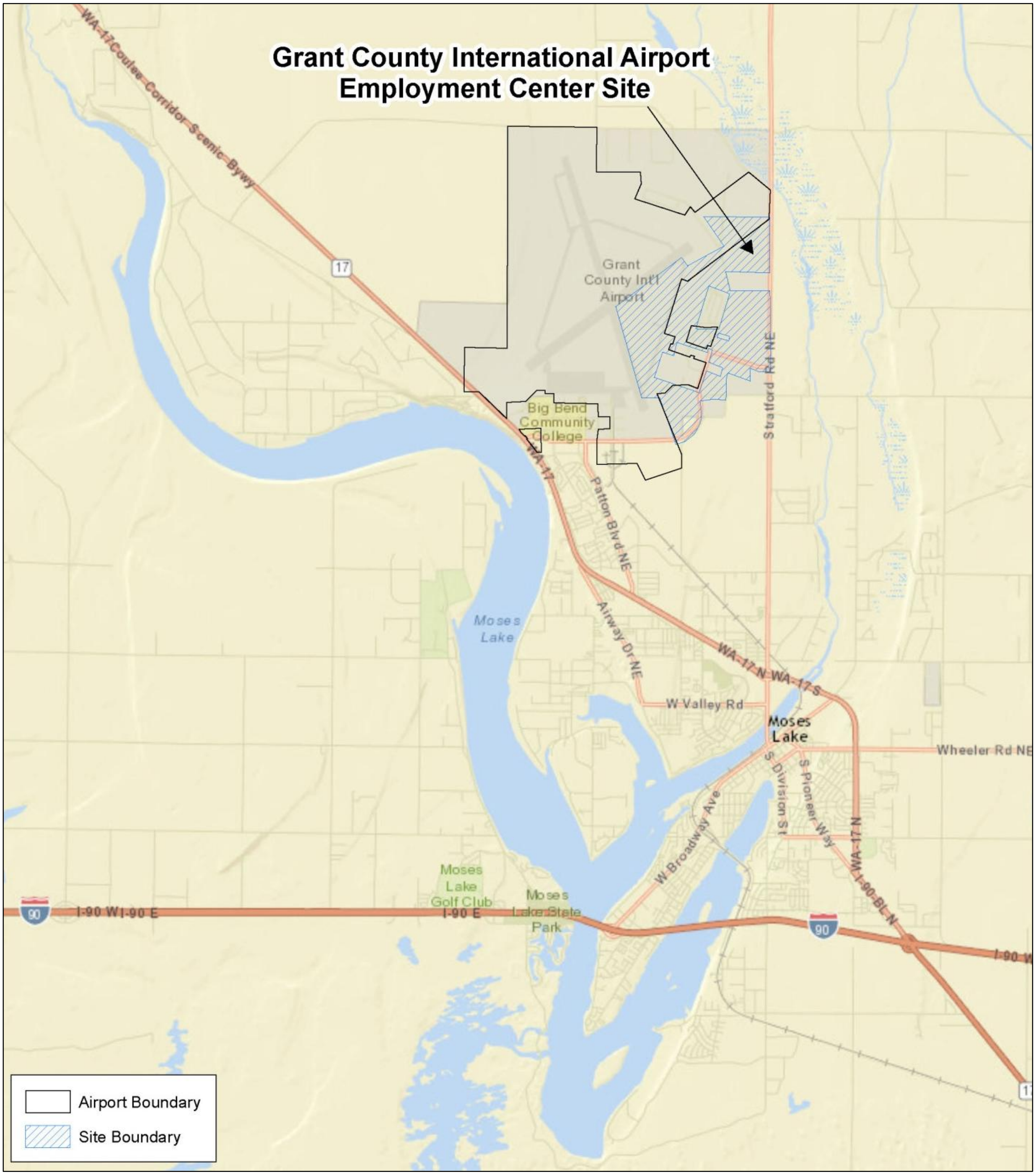

Source: EA, Esri, and OpenStreetMap 2015

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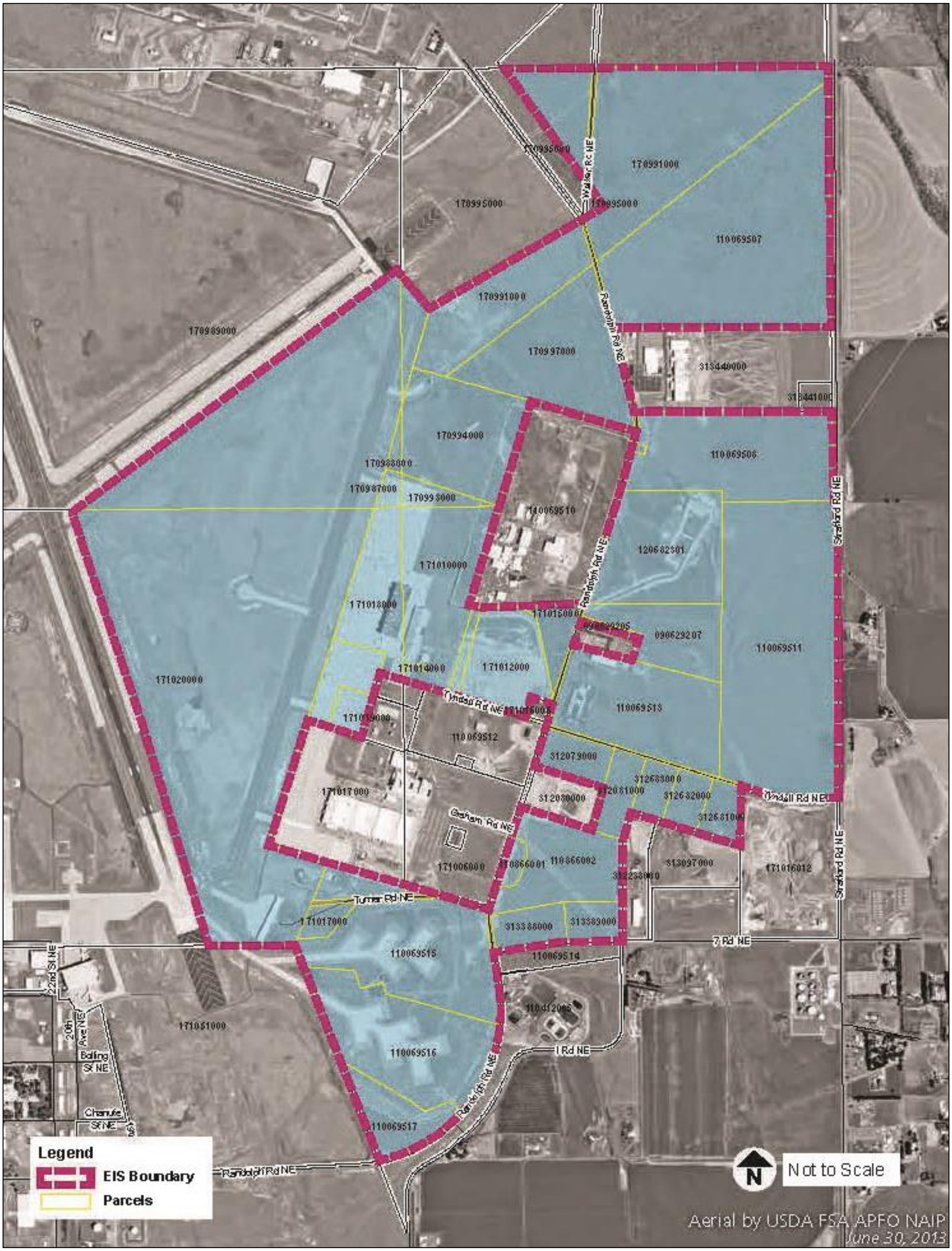
Grant County International Airport Moses Lake, Washington	**Vicinity Map**	Figure 1



Source: Reid Middleton 2015

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Grant County International Airport Moses Lake, Washington	**Existing Site Parcel Map**	Figure 2

TABLE 1
SUMMARY OF ALTERNATIVES
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

Features	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis[1]	Alternative 2 Light Manufacturing/ Technology Emphasis[2]	Alternative 3 No Action Alternative
Site Area (acres)			
Port-owned Properties	485	485	485
City-owned Properties	47	47	47
Privately-owned Properties	726	726	726
Total	1,258	1,258	1,258
New Building Area (sq. ft.)			
Aviation Development	2,245,460	2,245,460	
Revenue Support	274,494	548,897	
Heavy Industrial	6,289,693	7,290,967	
Total	8,809,647 [3]	10,085,324 [4]	0
New Employees (jobs)			
Aviation Development/ Revenue Support	2,994	2,994	
Heavy Industrial	10,585	16,016	
Total	13,519 [5]	19,010 [6]	0
Recommended Parking (stalls)	5,602 [7]	14,640 [8]	0

Source: *Reid Middleton, 2015.*

Assumptions:

[1] *Approximately 70% heavy manufacturing and 30% warehouse uses.*

[2] *Approximately 70% light manufacturing and 30% technology uses.*

[3] *Heavy manufacturing uses would occupy 528 acres and develop at a floor area ratio (FAR) of 0.20; warehouse uses would occupy 239 acres and develop at a FAR of 0.25. All buildings would be one-story, with the FARs taking into account the road frontage landscaping required by City of Moses Lake and the 8% of gross area in landscaping required by Grant County.*

[4] *Light manufacturing uses would occupy 528 acres and develop at a FAR of 0.25; technology/laboratory uses would occupy 239 acres and develop at a FAR of 0.30. All buildings would be one-story, with the FAR taking into account the road frontage landscaping required by City of Moses Lake and the 8% of gross area in landscaping required by Grant County.*

[5] *Aviation development employees are based on 750 sq. ft. of building area per employee; heavy manufacturing/warehouse employees area based on 601 to 627 sq. ft. of building area per employee.*

[6] *Aviation development employees are based on 750 sq. ft. of building area per employee; light manufacturing/technology employees are based on 466 to 509 sq. ft. of building area per employee.*

[7] *Recommended parking is based on 0.5 parking stalls/1,000 sq. ft. of airport development building area and 0.75 stalls/1,000 sq. ft. of heavy manufacturing/warehouse building area, per guidance from the Institute of Transportation Engineers (ITE) Parking Generation, 4th Edition (2010).*

[8] *Recommended parking is based on 0.6 stalls/1,000 sq. ft. of airport development building area, 0.75 stalls/1,000 sq. ft. of heavy manufacturing/warehouse building area and 2.84 stalls/1,000 sq. ft. of light manufacturing/technology building area, per guidance from the ITE Parking Generation, 4th Edition (2010).*

TABLE 2
POSSIBLE ACTIVITIES UNDER PROPOSED ALTERNATIVES
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

Land Use Designation/Zoning	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis	Alternative 2 Light Manufacturing/ Technology Emphasis	Alternative 3 No Action Alternative
Airport Operations	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions
Aviation Development	• Fixed base operators[1] • Specialized aviation service operations[3] • Aircraft maintenance • Retail fueling services • Warehouse (aircraft hangars)	• Fixed base operators[2] • Specialized aviation service operations[4] • Aircraft equipment sales/rentals • Vocational schools (flight training)	• Continuation of existing conditions
Revenue Support	• Facilities for manufacturing, processing &/or assembly of products • Warehouses	• Airport-related facilities[5] • Research facilities, testing laboratories • Vocational schools	• Continuation of existing conditions
Heavy Industrial	• Machine shop • Welding or metal fabrication • Heavy industrial; manufacturing, processing or packaging • Heavy construction equipment storage, sales & rental • Warehousing & distribution facilities • Bulk fuel storage • Transportation services (e.g., freight consolidation)	• Light industrial • Light manufacturing • Technological uses (e.g., laboratories)	• Continuation of existing conditions
Public Facilities	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions

Source: *Grant County Unified Development Code; City of Moses Lake Municipal Code; Port of Moses Lake Draft Final Airport Master Plan, June 2014.*

[1] *e.g., fueling, hangaring & aircraft maintenance.*

[2] *e.g., aircraft rental & flight instruction.*

[3] *e.g., airframe & power plant maintenance; avionics maintenance & sales; & aircraft restoration, painting, & refurbishing.*

[4] *e.g., flight training; air transportation to general public for hire; aircraft rental; aircraft sales; specialized flying services; & commercial skydiving.*

[5] *e.g., aviation-related or support businesses that do not require access to the airfield (e.g., rental car facilities; & aviation supply, equipment & pilot accessory sales)*

TABLE 3
GRANT COUNTY 2011 COMPREHENSIVE EMISSIONS INVENTORY SUMMARY
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

	Emissions Inventory (Tons / year)					
Source Category	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**VOCs**
Aircraft: military, commercial, general aviation	715	41	5	17	15	40
Recreational boats	941	78	0	5	5	333
Commercial and consumer solvents	0	0	0	0	0	4,965
Construction	0	0	0	542	57	0
Commercial fuel use: natural gas, oil, LPG	5	2	0	4	4	0
Residential fuel use: natural gas, oil, LPG	2	6	2	0	0	0
Fertilizer application	0	0	0	0	0	0
Wildfires	471	11	5	52	44	112
Food and Kindred Products	9	0	0	24	22	3
Aviation gas storage and transport, petroleum gas cans, bulk plants, and truck transport	0	0	0	0	0	290
Gasoline stations	0	0	0	0	0	133
Livestock wastes	0	0	0	0	0	0
Structure and motor vehicle fires, Cremation, Dental alloy production, Bench scale reagents, Fluorescent lamps	4	0	0	1	1	1
Natural emissions from soil and vegetation	4,004	978	0	0	0	15,811
Non-road mobile except locomotives	3,598	1,051	2	104	100	607
Agricultural and silvicultural burning	1,152	54	6	137	133	123
Residential outdoor burning: yard waste, trash	123	6	1	25	22	15
On-road mobile sources	19,257	3,449	10	123	102	1,516
Publicly owned treatment works	0	0	0	0	0	1
Point sources (major source)	0	0	0	0	0	0
Paved and unpaved road dust	0	0	0	5,045	587	0
Locomotives	60	358	2	10	10	19
Woodstoves, fireplaces, inserts	502	12	2	74	74	79
Commercial marine vessels	0	0	0	0	0	0
Dry cleaning, graphic arts, surface coating: industrial	0	0	0	0	0	217
Agricultural tilling and harvesting	0	0	0	7,288	1,429	0
Grant County Total	**30,844**	**6,046**	**36**	**13,452**	**2,604**	**24,264**

Source: Ecology website 2014a

CO = Carbon monoxide
NO_x = Nitrogen oxides
SO_2 = Sulfur dioxide
PM_{10} = Particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter
VOCs = Volatile organic compounds

TABLE 4
NATIONAL AND WASHINGTON STATE AMBIENT AIR QUALITY STANDARDS
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

	Federal		
	Primary	**Secondary**	**State**
Carbon Monoxide (CO)			
8 - Hour Average	9 ppm	No standard	9 ppm
1 - Hour Average	35 ppm	No standard	35 ppm
Ozone (ozone)			
1 - Hour Average	No Standard	No standard	0.12 ppm
8 - Hour Average (a)	0.075 ppm	0.075 ppm	No Standard
Particulate Matter (PM_{10})			
Annual Arithmetic Mean	No Standard	No Standard	50 µg/m^3
24 - Hour Average	150 µg/m^3	150 µg/m^3	150 µg/m^3
Particulate Matter ($PM_{2.5}$)			
Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3	No Standard
24-Hour	35 µg/m^3	35 µg/m^3	No Standard
Lead (Pb)			
Quarterly Average	0.15 µg/m^3 (b)	0.15 µg/m^3 (b)	No standard
Nitrogen Dioxide (NO_2)			
1-hour	0.100 ppm	No standard	No standard
Annual Average	0.053 ppm	0.053 ppm	0.05 ppm
Sulfur Dioxide (SO_2)			
Annual Average	No Standard	No Standard	0.02 ppm
24 - Hour Average	No Standard	No Standard	0.10 ppm
3 - Hour Average	No Standard	0.5 ppm	No Standard
1 - Hour Average	0.075 ppm	No Standard	0.40 ppm (c)

(a) Eight hour ozone standard went into effect on September 16, 1997. But implementation is limited.
(b) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
(c) 0.25 ppm not to be exceeded more than two times in any 7 consecutive days.

ppm = parts per million

Sources: Ecology website 2014c; EPA website 2014b

TABLE 5
WASHINGTON STATE FORECAST COMPREHENSIVE GREENHOUSE GAS EMISSION INVENTORY SUMMARY
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

	Forecast Annual GHG Emissions ($MMTCO_2e$) (a)	
Source Category	**2015**	**2035**
Electricity, Net Consumption-based	18.9	20.4
Residential / Commercial / Industrial	20.9	19.2
Transportation	44.7	46.8
Fossil Fuel Industry	0.6	0.7
Industrial Processes	7.0	13.6
Waste Management	4.6	7.3
Agriculture	6.0	6.2
Total GHG Emissions	**102.7**	**114.2**

Source: Ecology 2010

(a) Based on 2008 projection year

$MMTCO_2e$ = Million metric tons CO_2 equivalents

TABLE 6
LAND USE ASSUMPTIONS FOR GREENHOUSE GAS EMISSION CALCULATIONS
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

			Net Increase Above Existing (a)		
Land Use Category	**Unit**	**Existing**	**Alt. 1 (c)**	**Alt. 2 (d)**	**Alt. 3**
Light Industrial	1,000 SF	0	0	7,060	0
Manufacturing (b)	1,000 SF	0	6,167	0	0
Warehousing	1,000 SF	297	2,643	0	0
Office Space (non-medical)	1,000 SF	10	0	3,026	0
Disturbed Area (soil carbon)	1,000 SF	--	41,086 (e)	37,743 (f)	0

Sources: Brunner 2015a,b; Gibson 2015

(a) Values are approximate
(b) Not including stack emissions from process equipment
(c) Building area increase of approximately 8,809,647 SF, including 70% heavy manufacturing and 30% warehouse uses.
(d) Building area increase of approximately 10,085,324 SF, including 70% light manufacturing and 30% technology uses.
(e) Approximately 95% impervious surface area coverage in airport development areas and approximately 91% coverage in heavy manufacturing/warehouse areas, per guidance from the *User's Guide for the California Impervious Surface Coefficients*, 2010.
(f) Approximately 95% impervious surface area coverage in airport development areas and approximately 81% coverage in light manufacturing/technology areas, per guidance from the *User's Guide for the California Impervious Surface Coefficients*, 2010.

SF = Square feet

TABLE 7
SUMMARY OF FORECAST GREENHOUSE GAS EMISSIONS FOR EACH ALTERNATIVE
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

	Annual Average GHG Emissions ($MTCO_2e$ per year) (a)		
GHG Emission Estimates	**Alt. 1**	**Alt. 2**	**Alt. 3**
Existing Emissions (2015)		25,299	
Increase Above Existing (Stationary Combustion Heating /Cooling)	3,374	5,250	0
Increase Above Existing (Electricity)	8,266	21,543	0
Increase Above Existing (Transportation)	367,307	344,997	0
Increase Above Existing (Soil Carbon)	37,841	34,762	0
Project Related Forecast Emissions (2035) (b)	416,788	406,553	0
Total Forecast Emissions (2035)	442,087	431,852	25,299
2035 Increase Above No Action	416,788	406,553	--

(a) Values are approximate.
(b) Emission summary does not include major industrial source GHG emissions.

TABLE 8
POTENTIAL GREENHOUSE GAS EMISSION REDUCTION MEASURES
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
GRANT COUNTY, WASHINGTON

Reduction Measures	Comments
Site Design	
Retain and enhance vegetated open spaces.	Retains or increases carbon sequestration by plants.
Plant trees and vegetation near structures to shade buildings.	Reduces on-site fuel combustion emissions and purchased electricity, and enhances carbon sinks.
Minimize building footprint.	Reduces on-site fuel combustion emissions and purchased electricity consumption, materials used, maintenance, land disturbance, and direct construction emissions.
Design water efficient landscaping.	Minimizes water consumption, purchased energy, and upstream emissions from water management.
Minimize energy use through building orientation.	Reduces on-site fuel combustion emissions and purchased electricity consumption.
Building Design and Operations	
Apply LEED standards (or equivalent) for design and operations.	Reduces on-site fuel combustion emissions and off-site/indirect purchased electricity, water use, waste disposal.
Purchase Energy Star equipment and appliances for public agency use.	Reduces on-site fuel combustion emissions and purchased electricity consumption.
Incorporate on-site renewable energy production, including installation of photovoltaic cells or other solar options.	Reduces on-site fuel combustion emissions and purchased electricity consumption.
Design street lights to use energy-efficient bulbs and fixtures.	Reduces purchased electricity.
Construct “green roofs” and use high-albedo roofing materials.	Reduces on-site fuel combustion emissions and purchased electricity consumption.
Install high-efficiency HVAC systems.	Minimizes fuel combustion and purchased electricity consumption.
Eliminate or reduce use of refrigerants in HVAC systems.	Reduces fugitive emissions. Compare refrigerant usage before/after to determine GHG reduction.
Maximize interior day lighting through floor plates, increased building perimeter and use of skylights, celestories, and light wells.	Increases natural/day lighting initiatives and reduces purchased electrical energy consumption.
Incorporate energy efficiency technology such as super insulation motion sensors for lighting and climate-control-efficient, directed exterior lighting.	Reduces fuel combustion and purchased electricity consumption.
Use water-conserving fixtures that surpass building code requirements.	Reduces water consumption.
Reuse gray water and/or collect and reuse rainwater.	Reduces water consumption with its indirect upstream electricity requirements.
Use recycled building materials and products.	Reduces extraction of purchased materials, possibly reduces transportation of materials, encourages recycling and reduction of solid waste disposal.
Use building materials that are extracted and/or manufactured within the region.	Reduces transportation of purchased materials.
Use rapidly renewable building materials.	Reduces emissions from extraction of purchased materials.
Conduct third-party building commissioning to ensure energy performance.	Reduces fuel combustion and purchased electricity consumption.
Track energy performance of building and develop strategy to maintain efficiency.	Reduces fuel combustion and purchased electricity consumption.
Transportation	
Size parking capacity to not exceed local parking requirements and, where possible, seek reductions in parking supply through special permits or waivers.	Reduced parking discourages auto-dependent travel, encouraging alternative modes such as transit, walking, and biking. Reduces direct and indirect VMT.
Develop and implement a marketing/information program that includes posting and distribution of ridesharing/transit information.	Reduces direct and indirect VMT.
Subsidize transit passes. Reduce employee trips during peak periods through alternative work schedules, telecommuting, and/or flex time. Provide a guaranteed-ride-home program.	Reduces employee VMT.
Provide bicycle storage and showers/changing rooms.	Reduces employee VMT.
Use traffic signalization and coordination to improve traffic flow and support pedestrian and bicycle safety.	Reduces transportation emissions and VMT.
Apply advanced technology systems and management strategies to improve operational efficiency of local streets.	Reduces emissions from transportation by minimizing idling and maximizing transportation routes/systems for fuel efficiency.
Develop shuttle systems around business district parking garages to reduce congestion and create shorter commutes.	Reduces idling fuel emissions and direct and indirect VMT.

Source: Ecology 2008b

LEED = Leadership in Energy and Environmental Design

HVAC = Heating, ventilation, and air-conditioning

APPENDIX A

Greenhouse Gas Calculation Backup Documentation

GREENHOUSE GAS EMISSION CALCULATION SCREENSHOTS
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER DEIS
GRANT COUNTY, WASHINGTON

Project Emissions Summary

Project Name Existing Conditions

Enter Data
Select From Dropdown Menu
Automatic Calculation (No Input Necessary)

	Stationary Combustion	Electricity Use	Transportation	Total
Emissions Summary ($MTCO_2e$)	**397**	**1,000**	**23,903**	**25,299**

Stationary Combustion Method 3 - The size and land use of a proposed develop can be used to estimate operational stationary combustion emissions. This method uses national average fuel use rates for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Warehousing (ITE 150)	ksf	297	379
	Office Space	Non-Medical (ITE 710)	ksf	10	17
				Subtotal	**397**

Electricity Use Method 2 - The size and land use of a proposed develop can be used to estimate operational electricity production emissions. This method uses national average energy use rates for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Warehousing (ITE 150)	ksf	297	928.9
	Office Space	Non-Medical (ITE 710)	ksf	10	71.2
				Subtotal	**1,000**

Transportation Method 3 -T he size and land use of a proposed develop can be used to estimate operational transportation emissions. This method uses estimated trip generation rates in the Puget Sound for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Warehousing (ITE 150)	ksf	297	23,740
	Office Space	Non-Medical (ITE 710)	ksf	10	162
				Subtotal	**23,903**

GREENHOUSE GAS EMISSION CALCULATION SCREENSHOTS
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER DEIS
GRANT COUNTY, WASHINGTON

Project Emissions Summary

(pink)	Enter Data
(grey)	Select From Dropdown Menu
(blue)	Automatic Calculation (No Input Necessary)

Project Name Alternative 1

	Stationary Combustion	Electricity Use	Transportation	Total
Emissions Summary ($MTCO_2e$)	**3,374**	**8,266**	**367,307**	**378,947**

Stationary Combustion Method 3 - The size and land use of a proposed develop can be used to estimate operational stationary combustion emissions. This method uses national average fuel use rates for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Manufacturing (ITE 140)	ksf	6167	0
	Industrial	Warehousing (ITE 150)	ksf	2643	3,374
				Subtotal	**3,374**

Electricity Use Method 2 - The size and land use of a proposed develop can be used to estimate operational electricity production emissions. This method uses national average energy use rates for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Manufacturing (ITE 140)	ksf	6167	0.0
	Industrial	Warehousing (ITE 150)	ksf	2643	8,266.3
				Subtotal	**8,266**

Transportation Method 3 -T he size and land use of a proposed develop can be used to estimate operational transportation emissions. This method uses estimated trip generation rates in the Puget Sound for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Manufacturing (ITE 140)	ksf	6167	156,042
	Industrial	Warehousing (ITE 150)	ksf	2643	211,265
				Subtotal	**367,307**

GREENHOUSE GAS EMISSION CALCULATION SCREENSHOTS
GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER DEIS
GRANT COUNTY, WASHINGTON

Project Emissions Summary

Project Name Alternative 2

Legend	
(pink)	Enter Data
(gray)	Select From Dropdown Menu
(light blue)	Automatic Calculation (No Input Necessary)

	Stationary Combustion	Electricity Use	Transportation	Total
Emissions Summary ($MTCO_2e$)	**5,250**	**21,543**	**344,997**	**371,791**

Stationary Combustion Method 3 - The size and land use of a proposed develop can be used to estimate operational stationary combustion emissions. This method uses national average fuel use rates for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Light Industrial (ITE 110)	ksf	7060	0
	Office Space	Non-Medical (ITE 710)	ksf	3026	5,250
				Subtotal	**5,250**

Electricity Use Method 2 - The size and land use of a proposed develop can be used to estimate operational electricity production emissions. This method uses national average energy use rates for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Light Industrial (ITE 110)	ksf	7060	0.0
	Office Space	Non-Medical (ITE 710)	ksf	3026	21,543.4
				Subtotal	**21,543**

Transportation Method 3 -T he size and land use of a proposed develop can be used to estimate operational transportation emissions. This method uses estimated trip generation rates in the Puget Sound for different land uses.

Building Name	Sector	Land Use	Building Unit	Data	Annual GHG Emission ($MTCO_2e$)
	Industrial	Light Industrial (ITE 110)	ksf	7060	324,795
	Office Space	Non-Medical (ITE 710)	ksf	3026	20,202
				Subtotal	**344,997**

GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
ALTERNATIVE 1
GHG EMISSIONS BY IMPERVIOUS SURFACE (DISTURBED VEGITATION)

Construction Carbon Calculator Results

Approximate net embodied CO2 for this project is
37,841 metric tons.

Your Entries

Total Square Feet	**0**
Stories Above Grade	**NA**
Stories Below Grade	**NA**
System Type	**mixed**
Ecoregion	**North American Deserts**
Existing Vegetation Type	**Shrubland**
Installed Vegetation Type	**Short Grass or Lawn**
Landscape Disturbed (SF)	**41,086,415**
Landscape Installed (SF)	**0**

No building was detected so the calculation is only for the site - landscape disturbance and installation. If you meant to include a building please try again and make sure to enter a valid number for total square feet.

Construction Carbon Calculator formula version 0.03.5, last updated 2007.10.11. These results are an approximation. Your actual carbon footprint may vary. See assumptions for more information.

GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER
ALTERNATIVE 2
GHG EMISSIONS BY IMPERVIOUS SURFACE (DISTURBED VEGITATION)

Construction Carbon Calculator Results

Approximate net embodied CO2 for this project is

34,762 metric tons.

Your Entries

Total Square Feet	0
Stories Above Grade	NA
Stories Below Grade	NA
System Type	mixed
Ecoregion	North American Deserts
Existing Vegetation Type	Shrubland
Installed Vegetation Type	Short Grass or Lawn
Landscape Disturbed (SF)	37,743,490
Landscape Installed (SF)	0

No building was detected so the calculation is only for the site - landscape disturbance and installation. If you meant to include a building please try again and make sure to enter a valid number for total square feet.

Construction Carbon Calculator formula version 0.03.5, last updated 2007.10.11. These results are an approximation. Your actual carbon footprint may vary. See assumptions for more information.

reduce & renew | calculate | offset | about the calculator | assumptions | faq | send feedback

Appendix G

Noise Report

Noise Technical Report
Grant County International Airport
Employment Center Project
Grant County, Washington

June 18, 2015

Prepared for

EA Engineering, Science, and Technology, Inc., PBC
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FIGURES

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LIST OF ABBREVIATIONS AND ACRONYMS

City	City of Moses Lake
CFR	Code of Federal Regulations
County	Grant County
dB	Decibel
dB(A)	A-Weighted Decibel
DNL	Day-Night Average Sound Level
DEIS	Draft Environmental Impact Statement
FAR	Floor Area Ratio
FHWA	Federal Highway Administration
ft	Feet
FTA	Federal Transit Administration
GCC	Grant County Code
EPA	U.S. Environmental Protection Agency
ITE	Institute of Transportation Engineers
Leq	Equivalent Sound Level
MLMC	Moses Lake Municipal Code
NAC	Noise Abatement Criteria
Port	Port of Moses Lake
Site	Grant County International Airport Employment Center
SFT	Surface Transportation Board
SR	State Route
USGS	U.S. Geological Survey
WAC	Washington Administrative Code

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1.0 INTRODUCTION

This report has been prepared for EA Engineering, Science, and Technology, Inc., PBC (EA) and provides background information and analysis to support the preparation of the Noise section of the Draft Environmental Impact Statement (DEIS) for development of the Grant County International Airport Employment Center (Site; project area) project in Grant County, Washington (Figure 1). The Port of Moses Lake (Port) is preparing a Planned Action EIS for approximately 1,258 acres located to the east of Grant County International Airport in the Port, the City of Moses Lake and Grant County. The County and Port will act as the SEPA co-lead agencies, with EA contracting directly with the Port. The Site boundary for this analysis is shown on Figure 2.

The following sections describe basic noise principles, the current noise conditions in the Site vicinity, and applicable noise regulations. Impacts of the alternatives (Alternative 1: Heavy Manufacturing/Warehouse Emphasis; Alternative 2: Light Manufacturing/Technology Emphasis; and Alternative 3: No Action) are analyzed both programmatically and semi-quantitatively using screening-level modeling and other readily available noise data.

The proposed project is located in an industrial area, and construction and operational noise at the Site is not anticipated to result in impacts to noise-sensitive receivers, such as residences, in the vicinity. However, the level of development assumed for full buildout under Alternatives 1 and 2 is anticipated to support a large employee base, which will likely require alterations to roadway configurations in the vicinity and result in impacts from increased traffic on arterial roadways serving the Site. Roadway construction would also have temporary noise impacts for noise-sensitive receivers in the vicinity.

1.1 EXISTING CONDITIONS

Currently, the Site consists of mostly undeveloped land with industrial and airport zoning adjacent to the airport. The airport has historically produced noise associated with jet takeoff, landing, and taxiing, as well as maintenance operations. Traffic noise is currently produced from Stratford Road NE, Randolph Road NE, Road 7 NE, and State Route (SR) 17, in addition to other local streets in the project vicinity. There is also a railroad line located approximately 0.3 miles west of the employment center; this railroad line, which is operated by the Columbia Basin Railroad Company, terminates adjacent to the Site and runs south for approximately 0.9 miles before turning southeast. This rail line eventually intersects Stratford Road NE and SR 17. Currently, only two trains (one train, round trip) operate on this line per month (STB and WSDOT 2009).

2.0 PROPOSED PROJECT ALTERNATIVES

Two development alternatives (Alternatives 1 and 2) are analyzed, which assume industrial and commercial use development and increased employment opportunities at the Site. A No Action alternative (Alternative 3) is also evaluated. Alternative 1 is focused on heavy manufacturing and warehousing, and Alternative 2 is focused on light manufacturing and technology. Alternative 3 assumes no development at the Site. The proposed alternatives are summarized in Tables 1 and 2 below.

TABLE 1
SUMMARY OF ALTERNATIVES

Features	**Alternative 1 Heavy Manufacturing/ Warehouse Emphasis (a)**	**Alternative 2 Light Manufacturing/ Technology Emphasis (b)**	**Alternative 3 No Action Alternative**
Site Area (acres)			
Port-Owned Properties	485	485	485
City-Owned Properties	47	47	47
Privately-Owned Properties	726	726	726
Total	1,258	1,258	1,258
New Building Area (square feet)			
Aviation Development	2,245,460	2,245,460	
Revenue Support	274,494	548,897	
Heavy Industrial	6,289,693	7,290,967	
Total	8,809,647 (c)	10,085,324 (d)	0
New Employees (jobs)			
Aviation Development/	0	0	
Revenue Support	2,994	2,994	
Heavy Industrial	10,585	16,016	
Total	13,519 (e)	19,010 (f)	0
Recommended Parking (stalls)	5,602 (g)	14,640 (h)	0

Source: Reid Middleton 2015.

Assumptions:

(a) Approximately 70 percent heavy manufacturing and 30 percent warehouse uses.

(b) Approximately 70 percent light manufacturing and 30 percent technology uses.

(c) Heavy manufacturing uses would occupy 528 acres and develop at a floor area ratio (FAR) of 0.20; warehouse uses would occupy 239 acres and develop at a FAR of 0.25. All buildings would be one story, with the FARs taking into account the road frontage landscaping required by the City of Moses Lake (City) and the 8 percent of gross area in landscaping required by Grant County (County).

(d) Light manufacturing uses would occupy 528 acres and develop at a FAR of 0.25; technology/laboratory uses would occupy 239 acres and develop at a FAR of 0.30. All buildings would be one story, with the FAR taking into account the road frontage landscaping required by the City and the 8 percent of gross area in landscaping required by the County.

(e) Aviation development employees are based on 750 square feet (ft^2) of building area per employee; heavy manufacturing/warehouse employees area based on 601 to 627 ft^2 of building area per employee.

(f) Aviation development employees are based on 750 ft^2 of building area per employee; light manufacturing/technology employees are based on 466 to 509 ft^2 of building area per employee.

(g) Recommended parking is based on 0.5 parking stalls per 1,000 ft^2 of airport development building area and 0.75 stalls per 1,000 ft^2 of heavy manufacturing/warehouse building area, per guidance from the Institute of Transportation Engineers (ITE) Parking Generation, 4th Edition (2010).

(h) Recommended parking is based on 0.6 stalls per 1,000 ft^2 of airport development building area, 0.75 stalls per 1,000 ft^2 of heavy manufacturing/warehouse building area and 2.84 stalls per 1,000 ft^2 of light manufacturing/technology building area, per guidance from the ITE Parking Generation, 4th Edition (2010).

TABLE 2
POSSIBLE ACTIVITIES UNDER PROPOSED ALTERNATIVES

Land Use Designation/ Zoning	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis	Alternative 2 Light Manufacturing/ Technology Emphasis	Alternative 3 No Action Alternative
Airport Operations	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions
Aviation Development	• Fixed base operators (a) • Specialized aviation service operations (c) • Aircraft maintenance • Retail fueling services • Warehouse (aircraft hangars)	• Fixed base operators (b) • Specialized aviation service operations (d) • Aircraft equipment sales/rentals • Vocational schools (flight training)	• Continuation of existing conditions
Revenue Support	• Facilities for manufacturing, processing and/or assembly of products • Warehouses	• Airport-related facilities (e) • Research facilities, testing laboratories • Vocational schools	• Continuation of existing conditions
Heavy Industrial	• Machine shop • Welding or metal fabrication • Heavy industrial; manufacturing, processing or packaging • Heavy construction equipment storage, sales & rental • Warehousing and distribution facilities • Bulk fuel storage • Transportation services (e.g., freight consolidation)	• Light industrial • Light manufacturing • Technological uses (e.g., laboratories)	• Continuation of existing conditions
Public Facilities	• Continuation of existing conditions	• Continuation of existing conditions	• Continuation of existing conditions

Source: Grant County 2015; City of Moses Lake 2015; Port of Moses Lake Draft Final Airport Master Plan, June 2014.

(a) e.g., fueling, hangaring, and aircraft maintenance.

(b) e.g., aircraft rental and flight instruction.

(c) e.g., airframe and power plant maintenance; avionics maintenance and sales; aircraft restoration, painting, and refurbishing.

(d) e.g., flight training; air transportation to general public for hire; aircraft rental; aircraft sales; specialized flying services; commercial skydiving.

(e) e.g., aviation-related or support businesses that do not require access to the airfield (rental car facilities; aviation supply, equipment and pilot accessory sales)

3.0 SOUND AND NOISE FUNDAMENTALS

In order to assess existing noise conditions and potential noise impacts in the project vicinity, it is necessary to understand basic noise principles, as well as the regulatory background for noise-related issues. Below are brief definitions of basic noise-related terminology used in this section:

- **Sound**: A vibratory disturbance transmitted by pressure waves through a medium (e.g., air, water, and solids) and capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise**: Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB)**: A measure of sound intensity based on a logarithmic scale that indicates the squared ratio of actual sound pressure level to a reference sound pressure level of 20 micropascals.
- **A-weighted decibel [dB(A)]**: A measure of sound intensity that is weighted to account for the varying sensitivity of the human ear to different sound frequencies. Typical A-weighted noise levels for various types of sound sources are summarized in Table 3.
- **Equivalent sound level (Leq)**: A measure used to represent the average sound energy occurring over a specified time period. Leq is the steady-state sound level that would contain the same acoustical energy as the time-varying sound that actually occurs during the monitoring period. The 1-hour A-weighted equivalent sound level (Leq 1 h) is the energy average of A-weighted sound levels occurring during a 1-hour period.
- **Day-night average sound level (DNL)**: A measure used to represent the average sound energy occurring over a 24-hour time period, with a 10 dB penalty assigned for noise occurring at night.

3.1 BASIC PRINCIPLES OF NOISE

Table 3 shows the range of sounds often experienced by the community. Sound waves generally travel in a hemispherical pattern from a noise source at ground level, with the sound wave energy spreading out over a larger area as it travels away from the source. As the sound travels away from the source, its intensity declines (attenuates) at a rate known as the attenuation rate. When only considering distance, sound levels from isolated point sources typically decrease by about 6 dB(A) for every doubling of distance from the noise source. For a continuous line noise source, such as vehicle traffic on a highway, sound levels decrease by approximately 3 dB(A) for every doubling of distance. However, it is also important to consider the characteristics of the ground over which the noise attenuates, as different ground types have varying abilities to contribute to noise attenuation. For traffic noise studies, an attenuation rate of 4.5 dB(A) per doubling of distance is often used when the roadway is at ground level and the ground offers effective sound absorption (this is called “soft ground”). For stationary sources, the attenuation for soft-ground conditions can be approximated as 7.5 dB(A) per doubling of distance.

The human ear generally perceives an increase in noise of 10 dB(A) as a doubling of loudness and generally cannot detect differences of 1 to 2 dB(A) between noise levels of a similar nature. Under *ideal* listening conditions, some people can detect differences of 2 or 3 dB(A), but under *normal* listening conditions, a 5-dB(A) change in sound level of a similar nature is typically detectable. However, when an intruding sound is of a different nature from background (e.g., a backup alarm in an otherwise quiet neighborhood), most people can discern a new type of noise even if it only increases the overall Leq by less than 1 dB(A).

TABLE 3
TYPICAL A-WEIGHTED SOUND LEVELS

Sound Source	Decibels (A-weighted)	Typical Response
Carrier deck jet operation	140	Limit amplified speech
Limit of amplified speech	130	Painfully loud
Jet takeoff [200 feet (ft)] Auto horn (3 ft)	120	Threshold of feeling and pain
Riveting machine Jet takeoff (2,000 ft)	110	--
Shout (0.5 ft) New York subway station	100	Very annoying
Heavy truck (50 ft) Pneumatic drill (50 ft)	90	Hearing damage
Passenger train (100 ft) Helicopter (in flight, 500 ft) Freight train (50 ft)	80	Annoying
Freeway traffic (50 ft)	70	Intrusive
Air conditioning unit (20 ft) Light auto traffic (50 ft)	60	--
Normal speech (15 ft)	50	Quiet
Living Room Bedroom Library	40	--
Soft whisper (15 ft)	30	Very quiet
Broadcasting studio	20	--
	10	Just audible
	0	Threshold of hearing

Source: FTA 2006.

3.1.1 NOISE REGULATIONS

Issues and impacts related to noise may be regulated at the local, state, and federal levels. Future industrial facilities under Alternatives 1 and 2 would be subject to noise regulations at the local and state levels. This section describes potential applicable noise regulations.

3.1.1.1 Local: City of Moses Lake Noise Regulations

Chapter 8.28 of the City of Moses Lake Municipal Code (MLMC) establishes regulations to minimize the exposure of citizens to excessive noise. The MLMC states that certain noise-producing activities are prohibited and also lists exempt activities. The City does not have regulations for traffic noise.

The MLMC prohibits sounds originating from construction activity between the hours of 10:00 p.m. and 7:00 a.m., unless otherwise approved by the City Council.

Chapter 18.40 of the MLMC establishes permissible noise levels from industrial noise sources at receiving residential properties. The maximum permissible environmental noise levels from noise sources in industrial zones at receiving residential properties are 60 dB(A) during daytime hours (7 a.m. to 10 p.m.) and 50 dB(A) during nighttime hours (10 p.m. to 7 a.m.).

3.1.1.2 Local: Grant County Noise Regulations

For the portion of the Site located outside the Moses Lake City limits, assumed development would be subject to the noise regulations in the Grant County Code (GCC). Chapter 6.24 of the GCC establishes regulations related to noise and noise-producing activities. The GCC specifies prohibited noise-producing activities and exemptions, but does not specify permissible noise levels. The County does not regulate noise from traffic or temporary construction.

The Grant County Unified Development Code (Chapters 22 through 25) also provides regulations for noise related to development but generally references the maximum permissible noise levels established in Chapter 173-60 of the Washington Administrative Code (WAC).

3.1.1.3 State: Noise Control Act of 1974

WAC 173-60-040 establishes maximum permissible noise levels for various environments. Industrial operations and construction activities under all alternatives would be subject to these provisions. Industrial facilities are considered Class C facilities, and residences are considered Class A facilities under WAC 173-60-030. According to WAC 173-60-040, noise produced by a Class C facility may not exceed 60 dB(A) at Class A facilities.

3.1.1.4 State: Washington State Department of Transportation Traffic Noise Regulations

At this time, Washington State Department of Transportation (WSDOT) funding for roadway improvements associated with Alternatives 1 and 2 is not assumed and Site development would not be subject to WSDOT noise regulations. However, if future roadway improvements receive WSDOT funding, those improvements would need to comply with WSDOT noise standards.

WSDOT has adopted the Federal Highway Administration (FHWA) noise abatement criteria (NAC) for evaluating noise impacts and for determining if such impacts are sufficient to justify funding of noise abatement for new roadway construction and roadway widening projects with state funding. The WSDOT traffic noise policy described below meets the federal requirements of Title 23, Part 772 of the Code of Federal Regulations (CFR) described below, so compliance with the WSDOT traffic noise policy will meet FHWA noise requirements. For WSDOT-funded roadway projects, a noise impact occurs when a predicted traffic noise level under the design year conditions approaches within 1 dB(A) of the FHWA NAC [for example, WSDOT defines a traffic noise impact at a dwelling to be 66 dB(A) or higher]. In addition, WSDOT defines a traffic noise impact to occur when the predicted traffic noise level substantially exceeds the existing noise level. A 10-dB(A) increase over existing noise levels is considered a substantial increase.

3.1.1.5 Federal: Federal Highway Administration Traffic Noise Regulations

The assumed development under the EIS alternatives does not currently include roadway improvements; however, changes to the existing roadway system may be needed to accommodate increased traffic associated with the project (Heffron 2015). If future roadway improvements receive FHWA funding, distributed through WSDOT, then the noise criteria established in 23 CFR 772 would apply. The FHWA NAC are summarized in Table 4.

TABLE 4
FEDERAL HIGHWAY ADMINISTRATION NOISE ABATEMENT CRITERIA

Activity Category	Criterion [dB(A) Leq]	Description of Activity Category
A	57 (exterior)	Lands where serenity and quiet are of extraordinary significance and that serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	152 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: FHWA 2011.

3.1.1.6 Federal: Surface Transportation Board and Federal Transit Administration Noise Regulations

The Surface Transportation Board (STB) has established impact thresholds for noise produced by railroad projects, as described in 49 CFR 1105.7. A project is anticipated to have an impact if it will result in one of the following conditions:

- An incremental increase in noise levels of 3 dB(A) or more in community noise exposure as measured by DNL
- An overall DNL noise level increase of 65 dB(A) or greater.

The Federal Transit Administration (FTA) also provides guidelines for construction noise levels related to transit projects. In residential areas, the construction noise limit (8-hour Leq) is 80 dB(A) during daytime hours and 70 dB(A) during nighttime hours.

The employment center project does not assume changes to railroad lines and is therefore not subject to federal regulation by the STB or FTA.

4.0 METHODOLOGY

The study area used to evaluate noise impacts consists of the existing approximately 1,200-acre Grant County International Airport Employment Center Site; the agricultural, industrial, and commercial lands within the study area; and several representative noise-sensitive receivers outside the study area that could potentially be impacted by noise associated with the proposed new development. This noise study evaluated existing and future noise levels at the following representative noise-sensitive receivers (shown on Figure 2):

- Existing rural residences along Stratford Road NE, north of Tyndall Road NE (Receiver R-1)
- Existing rural residences along Stratford Road NE, south of Road 7 NE (Receiver R-2)
- Existing residential development in the Longview neighborhood, along Stratford Road NE, north of SR 17 (Receiver R-3)
  - This receiver is also representative of other noise-sensitive receptors along Stratford Road NE, such as Longview Elementary School
- The Endeavor Middle School, located on Randolph Road NE (Receiver R-4)
- Existing rural residences along Road 7 NE (Receiver R-5)
- Existing residential development east of SR 17, between the Randolph Road exit and Stratford Road NE exit (Receiver R-6)
- Existing residential development west of SR 17, northwest of Randolph Road (Receiver R-7).

4.1 FUTURE NOISE LEVEL ESTIMATES

4.1.1 INDUSTRIAL NOISE

Noise levels at industrial workplaces can be very high, sometimes approaching 95 dB(A) (Bogen 2015). For this analysis, it was assumed that very loud manufacturing activities would take place indoors and that allowed uses in the proposed employment center would comply with the industrial noise requirements in MLMC 18.40. It was therefore assumed that daytime noise levels associated with industrial activities would not exceed 60 dB(A) at surrounding residential properties. This regulation would also apply to allowed or conditionally allowed manufacturing uses, such as the testing of equipment or engines.

4.1.2 AVIATION NOISE

Noise levels generated by aviation activities were estimated using noise contours from the Grant County International Airport Master Plan Update (URS 2005). As described under Federal Aviation Regulation Part 150, a maximum DNL of 65 dB(A) is incompatible with residential land use. It was therefore assumed that noise levels associated with aviation noise would not exceed 65 dB(A) at surrounding noise-sensitive receivers.

4.1.3 Railroad Noise

The employment center project does not include proposed changes to railroad lines and is not subject to federal regulation by the STB or FTA. Therefore, future noise levels associated with railroads were not evaluated.

4.1.4 Traffic Noise Modeling Methods

Traffic noise often exceeds the FHWA and WSDOT NAC for homes within 200 ft of a freeway or within 50 to 100 ft of an arterial roadway. The magnitude of the traffic noise impact near any given roadway would depend on the traffic volume, traffic speed, number of lanes, and the setback distance to the homes.

For this assessment, traffic noise impacts caused by increased traffic on Stratford Road NE, Randolph Road NE, Road 7 NE, and SR 17 were evaluated for existing homes and noise-sensitive receptors. Peak-hour traffic volumes along these streets in the project vicinity under the existing conditions and projected for each alternative are listed in Table 4. Peak-hour traffic volume forecasts were provided by Heffron Transportation (Heffron 2015).

TABLE 5
WEEKDAY PEAK-HOUR TRAFFIC VOLUMES IN PROJECT VICINITY

Representative Receiver Location	Existing (2015)	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis (2035)	Alternative 2 Light Manufacturing/ Technology Emphasis (2035)	Alternative 3 No Action (2035)
Existing rural residences along Stratford Road NE, north of Tyndall Road NE (Receiver R-1)	207 (355)	1,348 (1,454)	1,763 (1,834)	308 (529)
Existing rural residences along Stratford Road NE, south of Road 7 NE (Receiver R-2)	310 (509)	3,122 (3,118)	4,187 (4,108)	462 (758)
Existing residential development in the Longview neighborhood, along Stratford Road NE, north of SR 17 (Receiver R-3)	310 (509)	3,122 (3,118)	4,187 (4,108)	462 (758)
The Endeavor Middle School, located on Randolph Road NE (Receiver R-4)	245 (254)	2,525 (2,298)	3,405 (3,118)	365 (378)
Existing rural residences along Road 7 NE (Receiver R-5)	161 (386)	1,050 (1,295)	1,380 (1,595)	240 (575)
Existing residential development east of SR-17, between Randolph Road and Stratford Road (Receiver R-6)	860 (957)	1,661 (1,761)	1,816 (1,906)	1,281 (1,426)
Existing residential development west of SR-17, northwest of Randolph Road (Receiver R-7)	823 (963)	2,736 (2,830)	3,431 (3,425)	1,226 (1,435)

XX = Morning peak hour trips
(XX) = Evening peak hour trips
Note: Traffic volume measured in vehicles/hour (combined vehicles in all directions).

Source: Heffron 2015.

The FHWA Traffic Noise Model Version 2.5 (FHWA 2004) was used to predict existing and future noise levels during the peak hour under the following screening-level assumptions. The model was configured as follows for Stratford Road NE, Randolph Road NE, Road 7 NE, and SR 17.

- No field measurements were performed for this screening-level noise study.
- It was assumed that all receivers have a direct line-of-sight to impacted roadways; barrier analysis was not conducted.
- Under all alternatives, medium trucks and heavy trucks were assumed to represent 6 percent and 3 percent of traffic volumes, respectively (Heffron 2015).
- Traffic was assumed to operate at the posted speed limit.
- The surface between the street and nearby residences consists mainly of asphalt and packed soil. Therefore, the ground surface type was defined as "hard surface" for the model.
- Traffic volumes were assumed to increase 2 percent each year, independent of the project (Heffron 2015).
- The higher traffic volume, between morning and evening peak-hour values, was used for analysis.
- Roadway widths were assumed to be the same between the existing condition and alternatives.
- All roads were modeled as straight lines; the model was not configured to account for roadway improvements or configuration changes resulting from the project.

4.2 IMPACT ASSESSMENT

Potential impacts associated with each type of noise source were assessed as described in the following sections.

4.2.1 INDUSTRIAL NOISE

In accordance with MLMC 18.40, a residential receiver was determined to be impacted if daytime noise levels associated with industrial activities would exceed 60 dB(A).

4.2.2 AVIATION NOISE

As described under Federal Aviation Regulation Part 150, a maximum DNL of 65 dB(A) is incompatible with residential land use. Therefore, a residential receiver was determined to be impacted if noise levels associated with aviation noise would exceed 65 dB(A) at the property.

4.2.3 RAILROAD NOISE

The employment center project does not include proposed changes to railroad lines and is not subject to federal regulation by the STB or FTA. Therefore, future noise levels associated with railroads were not evaluated.

4.2.4 Roadway Traffic Noise

For this screening-level study, a traffic noise impact at an existing noise-sensitive receiver was defined as an increase in peak-hour traffic noise of 10 dB(A) Leq or greater (future project level minus existing level) at the exterior outdoor use area of any existing dwelling.

These noise impact thresholds are derived from those used by WSDOT to define a "noise impact" for roadways constructed using state or federal funding (WSDOT's noise guidelines are described in the Noise Regulations section). WSDOT's noise guidelines would not apply to any roadway that was not constructed using state or federal funds. As indicated in Sections 3.1.1.3 and 3.1.1.4, state or federal funding is not assumed for the EIS alternatives.

5.0 RESULTS

The modeled noise levels for all noise sources under the existing conditions and all three alternatives are shown in Table 5. Table 5 lists the modeled daytime Leq noise levels at each representative receiver location for the existing conditions, categorized according to the individual noise source affecting that location. Aircraft noise is the dominant existing noise source on the airport property, but the 65 dB contour does not extend beyond the limits of the airport property. Beyond the airport property, traffic noise is the dominant existing noise source.

TABLE 6
ESTIMATED NOISE LEVELS

Noise-Sensitive Receiver	Noise Levels			
	Existing (2015)	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis (2035)	Alternative 2 Light Manufacturing/ Technology Emphasis (2035)	Alternative 3 No Action (2035)
Existing rural residences along Stratford Road NE, north of Tyndall Road NE (Receiver R-1)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Rail Noise (b)	N/A (d)	N/A (e)	N/A (e)	N/A (e)
Stratford Road NE (c)	56	63	64	58
Roadway Increase Compared to Existing Condition	0	7 dB(A) increase	8 dB(A) increase	2 dB(A) increase
Existing rural residences along Stratford Road NE, south of Road 7 NE (Receiver R-2)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Rail Noise (b)	N/A (d)	N/A (e)	N/A (e)	N/A (e)
Stratford Road NE (c)	62	70	71	64
Roadway Increase Compared to Existing Condition	0	8 dB(A) increase	9 dB(A) increase	2 dB(A) increase
Existing residential development in the Longview neighborhood, along Stratford Road NE, north of SR 17 (Receiver R-3)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Rail Noise (b)	0 (f)	0 (e)	0 (e)	0 (e)
Stratford Road NE (c)	62	70	71	63
Roadway Increase Compared to Existing Condition	0	8 dB(A) increase	9 dB(A) increase	1 dB(A) increase
The Endeavor Middle School, located on Randolph Road NE (Receiver R-4)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65

Noise-Sensitive Receiver	Noise Levels			
	Existing (2015)	Alternative 1 Heavy Manufacturing/ Warehouse Emphasis (2035)	Alternative 2 Light Manufacturing/ Technology Emphasis (2035)	Alternative 3 No Action (2035)
Rail Noise (b)	0 (f)	0 (e)	0 (e)	0 (e)
Randolph Road NE (c)	58	68	69	60
Roadway Increase Compared to Existing Condition	0	10 dB(A) increase	11 dB(A) increase	2 dB(A) increase
Existing rural residences along Road 7 NE (Receiver R-5)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Rail Noise (b)	N/A (d)	N/A (e)	N/A (e)	N/A (e)
Road 7 NE (c)	56	61	62	58
Roadway Increase Compared to Existing Condition	0	5 dB(A) increase	6 dB(A) increase	2 dB(A) increase
Existing residential development east of SR 17, between Randolph Road NE and Stratford Road NE (Receiver R-6)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Rail Noise (b)	N/A (d)	N/A (e)	N/A (e)	N/A (e)
SR 17 (c)	67	69	70	68
Roadway Increase Compared to Existing Condition	0	2 dB(A) increase	3 dB(A) increase	1 dB(A) increase
Existing residential development west of SR 17, northwest of Randolph Road NE (Receiver R-7)				
Industrial Noise (a)	0	<60	<60	0
Airport Noise (b)	<65	<65	<65	<65
Rail Noise (b)	N/A (d)	N/A (e)	N/A (e)	N/A (e)
SR 17 (c)	54	59	60	56
Roadway Increase Compared to Existing Condition	0	5 dB(A) increase	6 dB(A) increase	2 dB(A) increase

(a) Noise levels associated with industrial activities are maximum permissible noise levels per MLMC 18.40. Maximum permissible noise levels at residential properties are 60 dB(A) during daytime hours and 50 dB(A) during nighttime hours.

(b) Noise levels associated with airline and rail traffic are provided as day-night average sound levels (DNLs)

(c) Noise levels associated with traffic are provided as 1-hour equivalent sound levels (1-hr Leq)

(d) N/A indicates the receiver is not located in the vicinity of a railroad track under the corresponding alternative.

(e) The employment center project does not include proposed changes to railroad lines and is not subject to federal regulation by the STB or FTA. Therefore, future noise levels associated with railroads were not evaluated.

(f) Rail traffic is currently limited to only two trains (one train round trip) per month; therefore, railroad noise was assumed to be 0 under existing conditions.

6.0 IMPACT ASSESSMENT

Impacts from each category of noise source are discussed below.

6.1 NOISE RELATED TO INDUSTRIAL ACTIVITIES

6.1.1 ALTERNATIVE 1 (HEAVY MANUFACTURING/WAREHOUSE EMPHASIS)

Under Alternative 1, it is assumed that the Site would be developed into industrial property with an emphasis on heavy manufacturing and warehouse activities. This alternative would result in fewer employees and a smaller building area than Alternative 2, but could require larger industrial equipment associated with heavy manufacturing, which may result in higher levels of industrial noise. The Site is located on industrial property and noise-sensitive receivers are limited to scattered rural residences in the vicinity. It is assumed that future development will comply with the provisions of MLMC 18.40 and WAC 173.60.040, which establish permissible noise levels from industrial noise sources at receiving residential properties. As such, the assumed development under Alternative 1 is not anticipated to result in industrial noise impacts at noise-sensitive receivers.

6.1.2 ALTERNATIVE 2 (LIGHT MANUFACTURING/ TECHNOLOGY EMPHASIS)

Under Alternative 2, it is assumed that the Site would be developed into industrial property with an emphasis on light manufacturing and technology-related activities. This alternative would result in more employees, a larger building area, and a larger parking lot than Alternative 1, but may not require extremely large industrial equipment associated with heavy manufacturing. Therefore, Alternative 2 would likely produce less industrial noise than Alternative 1. The Site is located on industrial property and noise-sensitive receivers are limited to scattered rural residences in the vicinity. It is assumed that future development under Alternative 2 will comply with the provisions of MLMC 18.40 and WAC 173.60.040, which establish permissible noise levels from industrial noise sources at receiving residential properties. As such, the project is not anticipated to result in industrial noise impacts at noise-sensitive receivers.

6.1.3 ALTERNATIVE 3 (NO ACTION)

Under the No Action alternative, the Site would not be developed into an employment center at this time. The Site would remain under an industrial zoning designation and any future development, unrelated to this project, would be subject to the provisions of MLMC 18.40 and WAC 173.60.040.

6.2 NOISE RELATED TO CONSTRUCTION ACTIVITIES

This section describes noise impacts associated with construction activities for each alternative.

6.2.1 ALTERNATIVE 1 (HEAVY MANUFACTURING/WAREHOUSE EMPHASIS)

Under Alternative 1, the assumed new building area would be slightly smaller than under Alternative 2, although total impervious area would be slightly higher. It is anticipated that noise related to construction activities would be similar under Alternatives 1 and 2. Construction noise would be temporary, and noise from construction at the Site could cause minor temporary annoyance at scattered residences in the Site vicinity. Under both Alternatives 1 and 2, roadway configuration changes are recommended for arterial roads in the vicinity (Heffron 2015). Roadway construction along Stratford Road NE, Randolph Road NE, Road 7 NE, and SR 17 could cause annoyance at outdoor locations, residences, and other noise-sensitive receivers located adjacent to these roadways. Daytime temporary construction activity (between the hours of 7 a.m. and 10 p.m.) is not regulated under the MLMC.

6.2.2 ALTERNATIVE 2 (LIGHT MANUFACTURING/ TECHNOLOGY EMPHASIS)

Under Alternative 2, the assumed new building area would be slightly larger than under Alternative 1, although total impervious area would be slightly less. It is anticipated that noise related to construction activities would be similar under Alternatives 1 and 2. Both Alternatives 1 and 2 are anticipated to require changes to arterial roadway configurations (Heffron 2015), which would result in temporary construction noise in residential areas.

6.2.3 ALTERNATIVE 3 (NO ACTION)

Under the No Action alternative, the Site would remain undeveloped. Roadway configuration changes would not be anticipated in the near future. However, temporary construction noise would still occur from other proposed projects in the vicinity.

6.3 NOISE RELATED TO AIRCRAFT

Under all alternatives, it is assumed that development of the employment center would not result in changes to aircraft traffic at Grant County International Airport. As such, it is anticipated that there will be no impacts associated with aircraft-related noise. Surrounding noise-sensitive receptors would remain outside the airport's 65-dB(A) noise contour (URS 2005), which is the threshold for compatibility with residential land use, as described under Federal Aviation Regulation Part 150.

6.4 NOISE RELATED TO RAILROADS

This section describes noise impacts associated with railroad operations for each alternative.

6.4.1 ALTERNATIVE 1 (HEAVY MANUFACTURING/WAREHOUSE EMPHASIS)

The employment center project does not include proposed changes to railroad lines and is not subject to federal regulation by the STB or FTA. Therefore, future railroad noise under Alternative 1 is anticipated to be the same as existing railroad noise.

6.4.2 ALTERNATIVE 2 (LIGHT MANUFACTURING/TECHNOLOGY EMPHASIS)

The employment center project does not include proposed changes to railroad lines and is not subject to federal regulation by the STB or FTA. Therefore, future railroad noise under Alternative 2 is anticipated to be the same as existing railroad noise.

6.4.3 ALTERNATIVE 3 (NO ACTION)

The employment center project does not include proposed changes to railroad lines and is not subject to federal regulation by the STB or FTA. Therefore, future railroad noise under Alternative 3 is anticipated to be the same as existing railroad noise.

6.5 NOISE RELATED TO TRAFFIC

The results of the screening-level traffic noise modeling show that traffic-related noise from full build-out under Alternatives 1 and 2 may result in noise impacts at one receiver, which is the Endeavor Middle School, located on Randolph Road NE. No other noise-sensitive receivers were identified adjacent to Randolph Road NE during this screening-level analysis; however, if other existing or proposed noise-sensitive receptors are identified adjacent to Randolph Road NE, those receivers could potentially be impacted as well. Unless the project receives future WSDOT or federal funding for roadway improvements, WSDOT would have no authority for requiring evaluation of mitigation for impacts. Alternative 3 is not anticipated to impact existing noise-sensitive receivers.

6.5.1 ALTERNATIVE 1 (HEAVY MANUFACTURING/WAREHOUSE EMPHASIS)

Under Alternative 1, it is projected that the employment center could support up to 13,519 employees. Full build-out of Alternative 1 would likely require substantial roadway improvements along Stratford Road NE and SR 17, as well as additional improvements at key intersections (Heffron 2015).

Table 5 shows the forecast traffic noise levels for each representative receiver location. Under Alternative 1, the modeled peak-hour traffic noise increase at full build-out would exceed the WSDOT substantial increase impact threshold of 10 dB(A) at the Endeavor Middle School, located on Randolph Road NE. Based on the screening-level noise analysis, it was determined that employment levels up to those projected at 94 percent of full build-out under Alternative 1 would result in peak-hour traffic noise levels below the 10 dB(A) impact threshold at the Endeavor Middle School.

6.5.2 Alternative 2 (Light Manufacturing/ Technology Emphasis)

Under Alternative 2, it is projected that the employment center could support up to 19,010 employees. Full build-out of Alternative 2 would likely require substantial roadway and intersection improvements, similar to those needed under Alternative 1 (Heffron 2015).

Table 5 shows the forecast traffic noise levels for each representative receiver location. Under Alternative 2, the modeled peak-hour traffic noise increase at full build-out would exceed the WSDOT substantial increase impact threshold of 10 dB(A) at the Endeavor Middle School, located on Randolph Road NE. Based on the screening-level noise analysis, it was determined that employment levels up to those projected at 85 percent of full build-out under Alternative 2 would result in peak-hour traffic noise levels below the 10 dB(A) impact threshold at the Endeavor Middle School.

6.5.3 Alternative 3 (No Action)

Table 5 shows the forecast traffic noise levels at each receiver location. Under the No Action alternative, traffic volumes are anticipated to increase at a rate of 2 percent per year. Under the No Action alternative, the modeled peak-hour traffic noise levels remained below the 10 dB(A) WSDOT significant increase impact threshold at all locations. Therefore, traffic-related noise impacts are not anticipated under Alternative 3.

7.0 MITIGATION MEASURES

This section discusses potential mitigation measures to avoid, minimize, or compensate for potential noise impacts.

7.1 SITE PLAN FEATURES

The proposed alternatives do not currently incorporate mitigation measures for noise associated with facility operation. Mitigation measures may be required at industrial facilities to ensure compliance with the maximum permissible environmental noise levels established in WAC 173.60.040 and MLMC 18.40.

7.1.1 CONSTRUCTION NOISE ABATEMENT

Nighttime construction will not be allowed without approval from the Moses Lake City Council. The MLMC does not regulate noise from daytime construction activities. Regardless, based on Site-specific considerations at the time of construction permit review, the City may require all construction contractors to implement noise control plans for construction activities in the study area for daytime activities.

Construction noise could be reduced by using enclosures or walls to surround noisy stationary equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing time of operation, and locating equipment as far as practical from sensitive receivers. To reduce construction noise at nearby receivers, the following mitigation measures could be incorporated into construction plans and contractor specifications.

- Locate stationary equipment away from receiving properties
- Erect portable noise barriers around loud stationary equipment located near sensitive receivers
- Limit construction activities to between 7:00 a.m. and 8:00 p.m. on weekdays and between 9:00 a.m. and 6:00 p.m. on weekends and holidays to avoid sensitive receptors during nighttime hours
- Turn off idling construction equipment
- Require contractors to rigorously maintain all equipment
- Train construction crews to avoid unnecessarily loud actions (e.g., dropping bundles of rebar onto the ground or dragging steel plates across pavement) near noise-sensitive areas.

7.1.2 TRAFFIC NOISE MITIGATION

This screening-level traffic noise study indicated the potential for traffic noise impacts at one existing noise-sensitive receiver, the Endeavor Middle School, located on Randolph Road NE. However, no traffic noise abatement measures are proposed, as the MLMC does not regulate traffic noise.

Although the MLMC does not regulate traffic-related noise, if future roadway improvements receive WSDOT or federal funding, WSDOT may require Site-specific traffic noise studies and evaluation of feasibility/reasonability of noise abatement for impacted receivers. Based on the flat topography, the straight configuration of Randolph Road NE in this location, and the lack of existing obstructions between the school and the road, it is likely that a noise barrier would be considered feasible and reasonable by WSDOT.

Based on the screening-level noise analysis, it was determined that the following reductions in peak-hour traffic volumes on Randolph Road NE would result in noise levels below the substantial increase impact threshold of 10 dB(A) at the Endeavor Middle School:

- 6 percent peak-hour traffic volume reduction under Alternative 1
- 15 percent peak-hour traffic volume reduction under Alternative 2.

Traffic volume reductions could be accomplished by restricting vehicle usage on Randolph Road and would be considered only as the project approaches full build-out at the Site.

8.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

No significant unavoidable or adverse impacts have been identified for any of the project alternatives.

While the screening-level noise study used for this analysis indicated potential traffic noise impacts with full build-out under Alternatives 1 and 2 at the Endeavor Middle School on Randolph Road NE, this impact could likely be mitigated through construction of a noise barrier between the school and Randolph Road NE. Based on the flat topography, the straight configuration of Randolph Road NE in this location, and the lack of existing barriers between the school and the road, it is likely that a noise barrier would be considered feasible and reasonable by WSDOT. If future roadway improvements receive funding through WSDOT or FHWA, a Site-specific noise analysis and barrier analysis will most likely be required. No other noise-sensitive receivers were identified adjacent to Randolph Road NE during this screening-level analysis; however, if other existing or proposed noise-sensitive receptors are identified adjacent to Randolph Road NE, those receivers could potentially be impacted and require noise barrier analysis as well.

9.0 CONCLUSIONS

Based on the results of this screening-level analysis, it is anticipated that noise associated with industrial, aircraft, and railroad operations would not result in impacts to noise-sensitive receivers in the Site vicinity.

It is anticipated that increased traffic volumes associated with employment provided by the project would result in increased noise levels at one noise-sensitive receiver, the Endeavor Middle School located on Randolph Road NE. No other noise-sensitive receivers were identified adjacent to Randolph Road NE during this screening-level analysis; however, if other existing or proposed noise-sensitive receptors are identified adjacent to Randolph Road NE, those receivers could potentially be impacted as well. Future roadway improvements would likely be required to accommodate increased traffic volumes associated with the project (Heffron 2015). If these improvements receive WSDOT or federal funding, a Site-specific noise study, incorporating roadway configuration changes, field noise measurements, and evaluation of noise abatement (if impacts occur) would likely be required. Additionally, roadway improvements associated with the project would likely result in temporary construction noise impacts at receivers located along impacted roadways. However, daytime construction noise is not regulated under the MLMC.

10.0 LIMITATIONS

10.1 LIMITATIONS OF SCREENING-LEVEL NOISE STUDY

The conclusions made in this report are based on the results of a screening-level noise study that did not include field measurements or incorporation of detailed Site-specific information. While this method allows for preliminary assessment of potential impacts, it does not constitute a Site-specific noise study, as is typically required for WSDOT- or FHWA-funded projects. Limitations of this screening level noise study are as follows:

- Because buildings, terrain, and other barriers were not incorporated into the traffic noise model, projected traffic noise levels may be overestimated.
- Roadways were modeled as flat, straight roads. Roadway configuration changes would likely be required to accommodate increased traffic but are not incorporated into the screening-level traffic noise model.
- Noise levels related to aviation, industrial, and railroad activities are anticipated to be below applicable impact thresholds at noise-sensitive receivers. However, due to lack of data and Site-specific modeling, exact noise levels were not predicted.

10.2 USE OF THIS REPORT

This screening-level noise study has been prepared for the use of EA Engineering, Science and Technology , Inc. to support the preparation of the Noise section of the Draft Environmental Impact Statement for development of the Grant County International Airport Employment Center in Grant County, Washington. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.

Brittany N. Gordon
Senior Staff Biologist

Steven J. Quarterman
Associate Scientist

BNG/SJQ/ccy

11.0 REFERENCES

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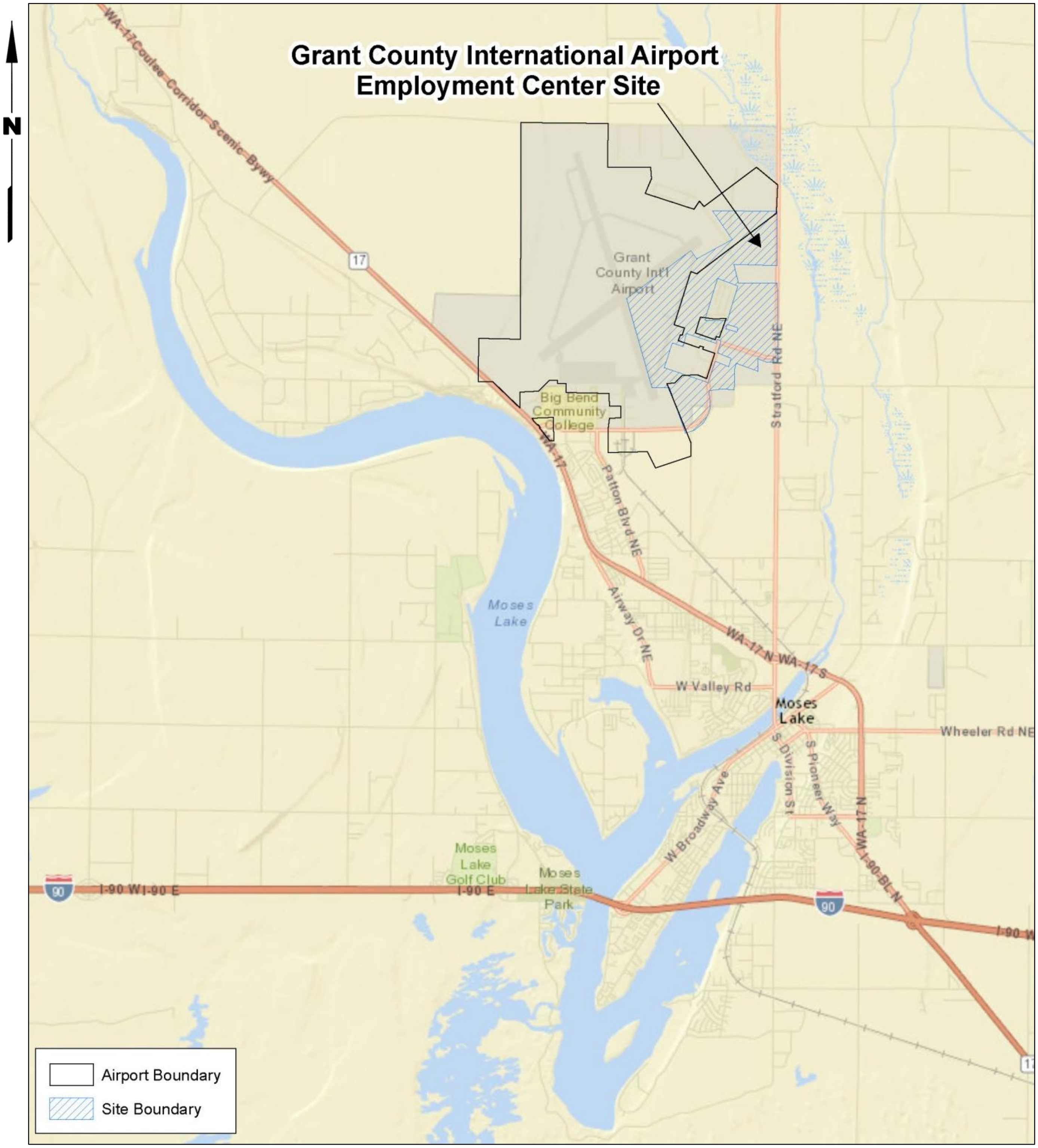

Source: EA, Esri, and OpenStreetMap 2015

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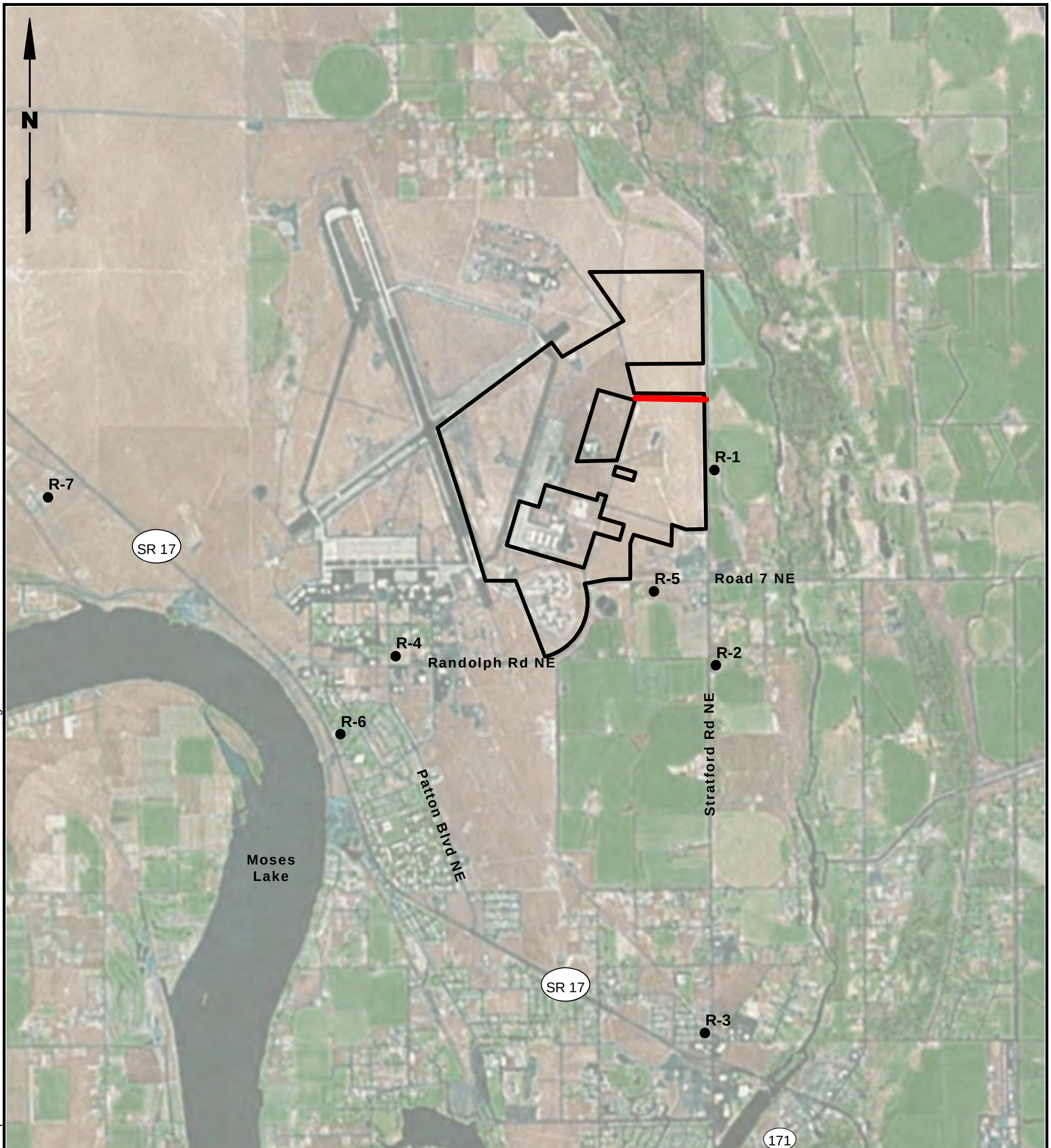
LANDAU ASSOCIATES

Grant County International Airport Moses Lake, Washington	**Vicinity Map**	Figure 1



Legend

- Receiver Location
- Potential Future Access Corridor
- Site Boundary

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 5,000 10,000

Scale in Feet

Data Source: Esri World Imagery.

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LANDAU ASSOCIATES

Grant County International Airport Moses Lake, Washington	**Noise-Sensitive Receivers**	Figure 2

Appendix H

Historic and Cultural Resources Report

CULTURAL RESOURCES TECHNICAL REPORT, GRANT COUNTY INTERNATIONAL AIRPORT EMPLOYMENT CENTER EIS, GRANT COUNTY, WASHINGTON

BY
MARGARET BERGER

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CRC PROJECT #1502N

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BAINBRIDGE ISLAND, WA 98110

MAY 7, 2015
REVISED MAY 13, 2015

Cultural Resource Consultants, Inc.

CULTURAL RESOURCES REPORT COVER SHEET

Author: Margaret Berger

Title of Report: Cultural Resources Technical Report, Grant County International Airport Employment Center EIS, Grant County, Washington

Date of Report: May 13, 2015

County(ies): Grant Section: 21, 22, 27, 28, 33, 34 Township: 20 N, Range: 28 E

Quads: Moses Lake North, WA Acres: 1,258

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

Executive Summary

This report presents methods and results of a cultural resources analysis for the Grant County International Airport Employment Center Planned Action EIS, in Grant County, Washington. On behalf of the Port of Moses Lake, Grant County, and the City of Moses Lake, EA Engineering, Science, and Technology, Inc., PBC (EA) requested that Cultural Resource Consultants, Inc. (CRC) prepare this cultural resources analysis to ensure that potential impacts to cultural resources are considered in the proposal in accordance with the Washington State Environmental Policy Act (SEPA), and other applicable regulations. CRC's investigations to date have included review of relevant background literature and maps, records on file at the Washington State Department of Archaeology and Historic Preservation (DAHP), and available project plans and related information; and reconnaissance survey of the proposal area. CRC also contacted cultural resource staff of the Wanapum, Colville, and Yakama tribes. At the time this report was completed, no response had been received.

The vast majority of the EIS area has not been covered by prior cultural resources surveys. No previously recorded archaeological sites are located within the study area. One previously recorded historic structure is present but was previously determined not eligible for the National Register of Historic Places (NRHP). Previously recorded cultural resources would not be significantly impacted by the project. Six structures over 50 years in age are present within the EIS area. These should be inventoried and evaluated for historical significance (i.e. eligibility for the NRHP) prior to specific development actions under the proposal. These structures may meet NRHP Criterion A based upon association with significant events (e.g., World War II and Cold War era defense) or Criterion C based upon significant engineering or architectural features. Evaluation of NRHP eligibility would take into consideration each structure's integrity (i.e. its ability to convey its significance) (NPS 2002). It is recommended that cultural resources surveys be conducted for any specific development actions under the proposal. Mitigation measures are recommended to avoid and minimize significant impacts to as-yet unrecorded cultural resources.

Cultural Resources Technical Report, Grant County International Airport Employment Center EIS, Grant County, Washington

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ATTACHMENTS

Introduction

Cultural Resource Consultants, Inc. (CRC) was retained by EA Engineering, Science, and Technology, Inc., PBC (EA) to conduct a cultural resources analysis for the Grant County International Airport Employment Center Planned Action EIS. Two development alternatives and a no action alternative were included in the analysis. The goal of CRC's assessment was to identify any previously recorded cultural resources in the project area, and evaluate the potential for previously recorded and unrecorded archaeological sites and historic buildings to be disturbed by construction and operations under the proposed alternatives. CRC's work was intended, in part, to assist in addressing state regulations pertaining to the identification and protection of cultural resources (e.g., RCW 27.44, RCW 27.53), and compliance with the Washington State Environmental Policy Act (SEPA). The Archaeological Sites and Resources Act (RCW 27.53) prohibits knowingly disturbing archaeological sites without a permit from the Washington State Department of Archaeology and Historic Preservation (DAHP), and the Indian Graves and Records Act (RCW 27.44) prohibits knowingly disturbing Native American or historic graves. Under SEPA, agencies must consider the environmental consequences of a proposal, including impacts to cultural resources, before taking action.

Assessment methods included a review of previous ethnographic, historical, and archaeological investigations in the local area, a records search at the Washington State Department of Archaeology and Historic Preservation (DAHP 2015) for known sites in the immediate area, a review of relevant background literature and maps (including General Land Office [GLO], United States Geological Service [USGS], and county atlases), a site visit, and the preparation of this report. CRC also contacted cultural resource staff of the Wanapum, Colville, and Yakama tribes. At the time this report was completed, no response had been received. This assessment utilized research design that considered previous studies, the magnitude and nature of the undertaking, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties within the project, as well as other applicable laws, standards, and guidelines (per 36 CFR 800.4(b)(1)).

Project Description

The proposal involves potential development of approximately 1,258 acres at Grant County International Airport, located in Grant County, Washington. The proposal involves property owned by the Port of Moses Lake, the City of Moses Lake, and private entities. Portions of the study area are within the City of Moses Lake and others are in unincorporated Grant County. The legal description for the study area is in the SE¼, SE¼ of the SW¼, and SE¼ of the NE¼ of Section 21; SW¼, SE¼, S½ of the NW¼, and S½ of the NE¼ of Section 22; Section 27; the E½ of the NW¼, E½ of the SW¼, NE¼, and SE¼ of Section 28; NE¼ of Section 33; and W½ of the NW¼ of Section 34, Township 20 North, Range 28 East, Willamette Meridian (Figure 1).

Two development alternatives (with different building densities and uses, both emphasizing aerospace and manufacturing uses under existing land use designations) and a no action alternative are proposed as described in Chapter 2. For the purposes of this assessment, the area of potential impacts to cultural resources is considered to be the EIS study area as described above and shown in Figures 1 – 3.

Affected Environment

Determining the potential for the property to contain cultural resources was largely based upon review and analysis of previously collected environmental and cultural information for the project area. Environmental and cultural context information for this project is derived from relevant published reports, articles, and books (e.g., Anglin 1995; Miller 1998; Steele and Rose 1904); historical maps and documents (e.g., Metsker 1961; USGS 1912; United States Surveyor General [USSG] 1882); historical air photos (USDA 1949, 1955, 1961 geological and soils surveys (e.g., USDA NRCS 2015; WA DNR 2015); ethnographic accounts (e.g., Ray 1974; Teit 1928); and reports of archaeological and historical investigations (e.g., Huntington Steinkraus and Steinkraus 2014; Kopperl and Heideman 2008; Sharley and Crisson 2005) pertinent to the study area. The following discussion of project area geology, archaeology, history, and ethnography incorporates context information from CRC's prior work in the Moses Lake area (e.g., Schumacher et al. 2010) by reference.

Environmental Context

The study area is situated on the Columbia Plateau in the Columbia Basin physiographic province (Franklin and Dyrness 1973) near the eastern edge of the Quincy hydrographic basin (Alt and Hyndman 1998). The region includes several ecological habitats dominated by shrub-steppe (Daubenmire 1970), characterized by hot summers with light precipitation and cool winter temperatures. Moses Lake, located within 1.75 miles southwest of the project, was historically a shallow natural lake and its water levels have been raised to support irrigation (Kershner 2007). The stream east of the proposal, Crab Creek, is labeled "Willow Creek" on early twentieth century topographic maps (USGS 1912, 1939). Twentieth century developments including the Columbia Basin Irrigation Project have altered hydrology and vegetation communities in the Moses Lake area by recharging paleolakes, seeps, waterways, and wetlands, and increasing the elevations of lake and river surfaces.

Three major episodes of climate change have shaped temperatures, sediment accumulation, and vegetation development throughout the region since the late Pleistocene (Mehringer 1985). Following deglaciation, between about 13,000 and 9,000 years before present (B.P.), temperatures increased dramatically, but climate conditions remained cooler and wetter than today. Vegetation was sparse but increased to include a range of arboreal species. Glaciers melted and glacial lakes shrank as they drained in catastrophic flood events. Conditions became warmer and drier at the beginning of the Holocene. Stream flows and lake areas decreased as a result of decreased effective moisture, giving rise to xeric-adapted plant species such as sagebrush. By 4,000 B.P., mixed coniferous forests and deciduous shrubs replaced xeric communities, and by 2,500 B.P., a cooler and wetter climate developed, comparable to present-day conditions. Historically, the Columbia River valley and major drainages in the surrounding area contained a relatively rich environment where abundant plants, animals, fish, and lithic raw material resources could be procured (Chatters 1986).

Geology of the Columbia Basin Province is dominated by Columbia River Basalt, the result of massive lava flows between 17 and 6 million years ago (Drost and Whiteman 1986). In the Pleistocene epoch, continental glaciers repeatedly retreated and advanced from the north, occasionally impinging on the northern Columbia Plateau. Failure of ice dams that had impounded glacial lakes such as Lake Missoula released extremely large volumes of water that catastrophically flooded major parts of the Columbia Plateau in Washington (Fecht et al. 1987:241). In the Quincy hydrographic basin, large amounts of water from these late Pleistocene cross-Scabland floods pooled and formed large lakes that drained to the south (Alt and Hyndman 1998). Crab Creek, within one mile east of the project, follows the course of a Missoula flood paleochannel (Crawford 2003). The glacial lakes reached an elevation of 850 to 1050 ft (260-350 m) (Badger and Galster 2003:161). These events scoured into basalt bedrock to create the Channeled Scabland, and left behind quickly deposited and poorly sorted sandy gravels, as well as lacustrine, slowly deposited slackwater sediments such as finely sorted sand and silt (Bretz et al. 1956; Orr and Orr 1996).

The surface geologic deposit mapped in the study area is Qfg (Pleistocene outburst flood gravels) (WA DNR 2015), indicative of the location's high-energy depositional environment in the late Pleistocene. Soil units mapped within the study area include Malaga stony sandy loam, 0 to 15 percent slopes; Malaga very stony sandy loam, 0 to 35 percent slopes; Malaga cobbly sandy loam, 0 to 15 percent slopes; and Malaga gravelly sandy loam, 0 to 5 percent slopes (USDA NRCS 2015). These soil units formed on terraces and in parent material composed of glacial outwash. Each of these units is considered somewhat excessively drained and has a strongly contrasting textural stratification 15 to 28 inches below surface (USDA NRCS 2015). The upper horizons vary among the units but all have extremely gravelly coarse sand beneath 18 inches below surface (Gentry 1984). The surface geologic and soil units in the study area indicate that deposition following the latest Pleistocene floods has been minimal and any archaeological material would be expected to occur above the flood deposits very near the present-day ground surface and not deeply buried.

Archaeological Context

Recent investigations support human presence in northwestern North America dating to 14,000 years ago (Gilbert et. al 2008). Human occupation of the Columbia Basin region has been archaeologically dated to approximately 12,000 years B.P. and is described by several phases of cultural development (e.g., Chatters 1986; Daugherty 1956; Galm et al. 1981; Greengo 1982, 1986; Lohse 1985, 2005; Mehringer and Foit 1990; Nelson 1969; Rice 1969; Schalk 1982). The general pattern of human adaptation in the region appears to exhibit a change through time from an upland hunting strategy to a semi-sedentary riverine-based subsistence organization. This change broadly occurs between an earlier tradition comprised of several phases (Clovis: ca. 11,500(?) to 11,000 B.P.; Windust: ca. 11,000 to 8000 B.P.; Vantage/Cascade: ca. 8000 to 4500 B.P.) and a subsequent, two-phase tradition: Frenchman Springs (ca. 4500 to 2500 B.P.), and Cayuse (ca. 2500 B.P. to 250 B.P.) (Ames et al. 1998; Swanson 1956).

The division between the two broad traditions is marked by the archaeological appearance of several apparent innovations. Pithouses are first recognized during this time; other artifacts appear, such as those suggestive of resource intensification (ground stone mortars, pestles, and net sinkers). Also apparent is increased variation in stone-working technology, decline in the predominance of basalt, and the appearance of small stemmed and larger notched projectile points. Archaeological evidence of a riverine-based residence pattern, supported by seasonal camps at upland locations, appears to correspond with the ethnographically observed Plateau pattern. The earliest manifestations of this residence pattern are present by about 4,500 years ago.

The Plateau winter village pattern, noted in ethnographic literature, appears to have been established by 2500 B.P. The Plateau subsistence model indicates a pattern of riverine settlement, a reliance on riverine and root resources, the development of complex fishing technologies, and the extension of trading patterns and extension of apparent political links (Greengo 1986; Nelson 1969; Swanson 1956). An increase in the frequency of net sinkers suggests a multifaceted economy emphasizing large-scale fishing, this possibly organized into inter-village groups. Points dated to the Cayuse period are generally smaller, with notching occasionally added to the chipped triangular form (Nelson 1969). Bow and arrow technology appears to be widespread by about 2000 years B.P., based on the morphology of projectile points from this time period. Cultural traditions established by the onset of the Cayuse phase appear to persist with little variation to the contact era, about 200 years ago, when disruptions associated with the Euro-American presence in the region resulted in a breakdown of traditional social patterns.

Ethnographic Context

The study area lies within the traditional territory of the Sinkayuse or Moses Columbia Tribes, Middle Columbia River Salishan people recognized as constituent tribes of, and today represented by the Confederated Tribes of the Colville Reservation (CTCR) (Miller 1998:Figure 1; Ray 1936; Relander 1986; Spier 1936; Teit 1928). The Sinkayuse shared many broadly defined traditions with other Middle Columbia River Salishan groups, including lacustrine or riverine settlement patterns, subsistence emphasis on salmon and other fish, land game, and a wide variety of abundant vegetable foods, and household and village communities linked by family and exchange relations (Chalfant 1974; Miller 1998; Ray 1936, 1974; Teit 1928).

The Sinkayuse occupied the area east of the Big Bend of the Columbia River with their main village at Rock Island (Miller 1998:253). The Moses Lake area was used in spring and summer for gathering a variety of resources. The Sinkayuse and neighboring groups such as the Wanapum dug for root vegetables including camas, biscuitroot, and bitterroot near the south end of Moses Lake, between Moses Lake and Coulee City, and in the Ephrata area (Chalfant 1974:296-298; Hunn 1990:105). In the summer, groups of Sinkayuse camped at Moses Coulee, Grand Coulee, and Moses Lake. Moses Lake was known as a good place to hunt ducks and geese and collect their eggs (Chalfant 1974:290-295; Teit 1928:118).

Sinkayuse settlements in the Moses Lake area included ta’aγasik, “turtle place;” nqiyx^{w}átk^{w}, “stinking water;” siálĭlaqən, “spring;” and squγátqu, “narrow channel” (Miller 1998:Figure 1). Each of these was located near the northeastern shoreline of Moses Lake, within approximately 1 to 5 miles from the project area. Smohala and his band frequently camped near the lower end of Moses Lake at a place called Tamewikes (Relander 1986:315-316), and Chief Moses is reported to have camped near a spring on the west side of Rocky Ford Creek (Ruby and Brown 1965:10). These camps were over five miles south and west of the project, respectively. The Rocky Ford camp, called Entepasneut (Ruby and Brown 1965:10) or Entopas-Noot (Anglin 1995:30-13), was known throughout the region and beyond as a trading post, with bands traveling from as far away as the Great Plains and Rocky Mountains to trade buffalo, horses, deer, roots, and salmon among other goods (Anglin 1995:31).

Historic Context

The study area is situated within the ceded lands Confederated Tribes and Bands of the Yakama Nation under the terms of the Yakama Treaty signed at Walla Walla in 1855 (Kappler 1904). In response to Chief Moses' request for a separate home for his people, the Columbia Reservation was established west of the Okanogan River in 1879. However, this reservation did not include any traditional Sinkayuse lands. Chief Moses and other leaders relinquished the reservation in 1883, moving instead to the Colville Reservation (Miller 1998:266, 267; Ruby and Brown 1965:93-97).

The General Land Office (GLO) cadastral survey map does not show any cultural features such as trails, roads, residences, villages, or homestead improvements in or adjacent to the study area. The nearest cultural feature is the "Road from White Bluffs to Lake Chelan" that passes within two miles to the southwest. An "Indian Camp" and spring are noted about seven miles to the northwest (USSG 1882). Euro-American land use in the area in the late nineteenth century likely consisted of cattle or sheep grazing. According to Meinig (1968), by the early twentieth century, the area between Moses Lake and Crab Creek formed the only remaining undisturbed stock district east of the Columbia River.

Based upon review of GLO records on file at the Bureau of Land Management (BLM), Euro-American settlement of the study area was sparse and the first individual land claims were not filed until the 1910s (BLM 2015) (Table 1). Two parts of the EIS area were deeded to the Northern Pacific Railroad Company in 1896 and 1916, respectively. The towns Neppel and Moseslake were established on the east side of Moses Lake and another community, Mae, developed west of the lake. Neppel, which was located along a Chicago, Milwaukee, and St. Paul Railroad spur beginning in 1905, was incorporated as Moses Lake in 1938 (Kershner 2007; Seedorf 1991:1). Originally part of Douglas County, established by the Washington Territorial Legislature in 1883, Grant County was formed in 1909 (Flom 2006). Farms and orchards were successful near local watercourses but had limited potential on drier uplands such as the study area. Agriculture increased following construction of the Columbia Basin Irrigation Project beginning in 1946 (Hartmans 2012), which featured canals such as the East Low Canal approximately three miles northeast of the EIS area (Crisson 2004; USBOR 1942).

Review of historical maps indicates that the study area was sparsely inhabited prior to development of the air base. In the early twentieth century, a road ran east-west between Sections 21 and 22 and Sections 27 and 28 and another road followed the east side of Sections 27 and 34 (Ogle 1917; USGS 1912, 1939). One structure is shown near the middle of the western edge of Section 22 on topographic maps from this era. The 1917 county atlas shows four buildings in the western part of Section 22 on lands owned by William J. Dols and Albert C. Muller, and a fifth on a 40-acre parcel on the east edge of Section 22 owned by W. H. & N. S. Burger (Ogle 1917). The southern half of Section 21 had been divided into seven lots by this time but land in the north half of Section 21 as well as in Sections 27, 28, 33, and the north half of Section 34 consisted of 320- or 640-acre tracts (Ogle 1917). Land use during this period likely included ranching and possibly farming.

Following the entrance of the United States into World War II, the U.S. Army opened the Moses Lake Army Air Depot in 1942 on a large tract of land encompassing the EIS area (Caldbick

2010; Department of the Air Force 2008; Larson Air Force Base ca. 1961). The Moses Lake Army Air Depot was initially used as a training center for P-38 pilots and B-17 combat crews (Denfeld 2012). At the end of the war, the base was put on standby status. Over the next few years, the main activity at the base was testing the B-47 and B-50 built by Boeing Aircraft Company. The base was reopened as a permanent installation in 1948 with the mission of protecting Hanford Atomic Works, Grand Coulee Dam, and the coast (Denfeld 2012). The base was redesignated Larson Air Force Base in 1950, named for Major Donald A. Larson, who was killed on a fighter mission in Germany in 1944. Moses Lake/Larson AFB was operated by Air Defense Command (1948-1952), Tactical Air Command (1952-1957), Military Air Transport Service (1957-1960), and Strategic Air Command (1960-1964) (Shaw 2014).

The base included the entire study area, and most of the land in the study area was maintained as an undeveloped security buffer, with landscape modifications as needed to provide clear lines of sight around base facilities (Central Washington University 2015; Metsker 1961; USDA 1949, 1955, 1961; USGS 1957). The focus of operations was on aviation and nuclear arms, but activities also included training in use of heavy equipment (e.g., bulldozers) and in fire suppression. These activities were generally carried out in the undeveloped area east of the airport. Most base support facilities, such as housing, a hospital, and administrative buildings, were developed between the south side of the airport and the north shore of Moses Lake (USDA 1949, 1955, 1961).

From 1952 to 1960, Air Force missions in which Larson AFB played an important role included construction of the Distant Early Warning Line and White Alice communications network in the Arctic, mercy flights to East Pakistan, as well as missions to Taiwan, North Africa, Saudi Arabia, South America, and the 'Down Range' project from Florida to Ascension Island (Denfeld 2012; Larson Air Force Base ca. 1961). From 1955 to 1959, Boeing tested its B-52 at Larson AFB's Air Materiel Command Flight Test Center (URS Corporation 2005). According to Denfeld (2012), "the B-52 Stratofortress would become the backbone of the United States Cold War nuclear strategy." A large (1,068 feet long and 372 feet wide) hangar was built to accommodate eight B-52s or KC-135 tankers (Department of the Air Force 2008:3.79). This hangar is now the Genie Industries manufacturing plant (Port of Moses Lake 2014), not included in the EIS area. Larson AFB was selected as an Intercontinental Ballistic Missile site in 1960. Three SM-68 Titan missile complexes were built offsite while support facilities were housed at Larson (Shaw 2014:Table 2.3). There were 15 B-52s at Larson in the early 1960s, several of them on combat readiness alert at the SAC Alert Center (Port of Moses Lake 2014).

According to Chasteen (2007:3), Colonel Clyde W. Owen took command of the base in 1963 and implemented a base improvement program that demolished 104 buildings on the base and replaced them with more modern buildings. In spite of modernization efforts, Larson AFB was among the 80 defense installation closures in the continental U.S. announced in November 1964 (Denfeld 2012; Shaw 2014:Table 3.3). The General Services Administration granted three hangars to Big Bend Community College and the runways and other aviation facilities to the Port of Moses Lake, which opened Grant County International Airport on the former base in 1966 (Caldbick 2010). The airport is classified as a Commercial Service Facility and has been used as a heavy jet training and testing facility by the Boeing Company (1950s to present), Japan Airlines (1960s to 2009), the U.S. Military, and other air carriers (City of Moses Lake 2015).

The 4,300-acre airport has four runways, the largest of which is 13,503 feet long (Runway 14L-32R) (URS Corporation 2005:2.15). The runways are adjacent to the west side of the EIS area.

Some of the features of the present-day airport were built during its use by the Army and Air Force between 1942 and 1965, and Boeing Aircraft Company beginning in the 1940s (PML Inventory 2014). Original features of the base, constructed in 1942 and 1943, include two runways, each originally 500 by 10,000 feet; a parking apron 600 by 4,000 feet; and connecting 75 foot wide taxiways (URS Corporation 2005). The original pavement construction was completed with panels that were six-inch thick portland cement concrete (PCC) pavement with eight inch thickened edges (called 8"-6"-8" by the military) (URS Corporation 2005). The base's primary and crosswind runways, both originally 500 feet wide, are now 200 feet and 100 feet wide, respectively (Port of Moses Lake 2014).

Previously Recorded Sites and Surveys

Ten cultural resource assessments have previously been prepared within a distance of approximately one mile from the study area (Table 2). Most of these were archaeological and historic resource surveys for proposed road improvement projects (e.g., Kopperl and Heideman 2008; Sharley and Crisson 2005). Reports have also been prepared for proposed electrical transmission upgrades (Schumacher et al. 2010), a manufacturing facility (Sharpe 2010), wireless communications facilities (Hale and Kelly 2001), and a natural gas line (Rader 1998). Pedestrian survey and shovel testing of a large tract of land west of Grant County International Airport, just over one mile west of the EIS area but in a similar landform and depositional setting, identified several scatters of historic-era archaeological material but only one precontact artifact (Harder 2013).

Two prior cultural resources assessment intersected portions of the current study area (Rader 1998; Schumacher et al. 2010), and a third was adjacent to the study area (Sharpe 2010). Rader (1998) conducted a cultural resources survey for a proposed natural gas pipeline that included segments along Randolph Road and Tyndall Road. Pedestrian survey did not identify any precontact or historic period archaeological material, and the roadside project alignment was considered to have been previously disturbed by farming as well as road and utility construction (Rader 1998:5). Schumacher et al. (2010) conducted a cultural resources survey of improvements to existing electrical utilities and installation of new transmission infrastructure between Randolph Substation and the SGL carbon fiber production facility. This survey identified the area as having minimal sediment deposition since the Pleistocene and widespread disturbance of the ground surface. Results of pedestrian survey and shovel testing were negative for archaeological and historic sites (Schumacher 2010:5-6). Sharpe (2010) conducted a cultural resources survey prior to construction of the SGL facility, which is bordered on three sides by the EIS area. Pedestrian survey and excavation of six shovel probes did not identify any historic period or precontact archaeological material.

As a result of these investigations, relatively few archaeological or historic sites have been identified in proximity to the current project area. The nearest archaeological sites are located one to two miles away from the study area (Table 3). These include seven historic period archaeological sites and one precontact isolate. Four of the sites are historic debris scatters or dumps and a fifth includes historic debris and unidentifiable structural remains, all of which were recommended not eligible for the National Register of Historic Places (NRHP). Two sites, a historic well and a historic road, have not been evaluated for NRHP eligibility. All of these sites are over one mile from the project area and would not be affected. The nearest precontact archaeological sites are over two miles west and southwest of the project area near the present-day Moses Lake shoreline. These include a low-density scatter of precontact lithic material (45GR677) and two precontact housepit sites (45GR25 and 45GR36) on the Lake Moses shoreline over two miles southwest of the project. These latter two sites were identified in 1947 during a survey of U.S. Bureau of Reclamation projects (Daugherty 1948), which is the earliest formal archaeological survey on file at DAHP for the Moses Lake area.

There are no register-listed historic properties within a ten-mile radius from the project. In fact, the nearest register-listed sites are the Bell Hotel and Grant County Courthouse in Ephrata approximately 13 miles to the northwest, and the Lind Coulee Archaeological Site approximately 20 miles to the southeast outside the town of Warden (DAHP 2015). However, several historic buildings have been inventoried within approximately ¼ mile from the project (Table 4). These include former Larson Air Force Base facilities including single family homes built as military housing, drainage ditches and other infrastructure, a railroad branch line, and a hangar. Historical significance of most of these resources was evaluated, with the majority of them determined not eligible for the NRHP. One inventoried building has not been evaluated but dates to 2003 and is not expected to meet NRHP criteria of significance due, in part, to its age. One building, the Larson Air Force Base In-Flight Kitchen, was determined eligible for the NRHP under Criterion A based upon its association with U.S. Cold War military activity and under Criterion C because it was considered a good example of the Contemporary architectural style (Beckner 2014). This building is outside the study area and is not anticipated to be impacted by the project.

One of the recorded historic structures is located within the EIS area. The drainage ditch adjacent to the Alert Center is an unchannelized, gravel-lined, low-sloped ditch in an undeveloped field near the eastern perimeter of the former Larson Army Air Base (Chasteen 2007). Chasteen (2007) identifies this as a storm drainage ditch but this feature was more likely intended to drain water used in extinguishing fires that might occur at the base. The ditch was determined not eligible for the NRHP. Any future development causing alteration or destruction to the ditch would not constitute a significant impact to cultural resources.

Potential for Previously Unrecorded Cultural Resources

The DAHP statewide predictive model uses environmental data about the locations of known archaeological sites to identify where previously unknown archaeological sites are more likely to be found. The model correlates locations of known archaeological to environmental data "to determine the probability that, under a particular set of environmental conditions, another location would be expected to contain an archaeological site (Kauhi and Markert 2009:2-3). Environmental data categories included in the model are elevation, slope, aspect, distance to water, geology, soils, and landforms. The model assigns a probability ranking of "Survey Highly Advised: High Risk" for the majority of the study area with areas marked "Survey Highly Advised: Very High Risk" along its eastern edge (DAHP 2015). Precontact and early historic-period land use patterns suggest that the northeastern part of the study area, which is nearest to Crab Creek, would have a higher potential for archaeological resources. This part of the study area is also northeast of the end of Runway 4-22 in the "crash zone," which means development and other activities were more or less avoided in this area, likely resulting in less ground disturbance than other parts of the EIS area.

Although the model suggests high archaeological potential for the EIS area, information derived from historical maps, photographs, geological maps, and other sources indicate that overall, the landscape of the EIS area has a low potential to contain archaeological sites. Precontact use of the area likely involved hunting game and collecting plants for food, technological, and medicinal uses. Archaeological correlates of these activities could include fire-cracked rock and charcoal concentrations, lithic debitage, tools or fragments of tools used in hunting and harvesting, and animal bones. The presence of glacial outburst flood deposits near the ground surface throughout the study area (WA DNR 2015) indicates that little if any deposition has accrued since the latest Pleistocene, which roughly coincides with the earliest known human occupations in the region. Precontact archaeological sites, if present, would be found relatively near the ground surface on top of the flood deposits. Recent aerial imagery shows vacant land with evidence of earthmoving activity including vehicle tracks, blade scars, and push piles within the study area (Google 2015). Construction of runways and other airport facilities involved grading and other earthmoving activity over large portions of the study area. Historical aerial imagery shows numerous vehicle tracks, blade scars, and other evidence of earthmoving, even in currently undeveloped parts of the study area (USDA 1949, 1955, 1961; USGS 1957). Intact native soils are not expected to be present in the majority of the project due to the absence of depositional environments and the history of air base development and demolition that has disturbed broad areas of near-surface sediments.

Historic-period uses of the project have included farming, military training, defense, and military and civilian aviation. These activities could potentially have resulted in deposition of archaeological materials; such deposits could arguably be significant if they retained depositional integrity and could result in data that would inform research questions regarding facets of historical life relevant to the social, economic, or cultural development of the region. Development of the air base is likely to have removed earlier historic archaeological materials, but these could include remnants of livestock pens, homesteads, fence lines, domestic refuse, or other evidence of residential or agricultural activity.

Although the number of standing structures within the EIS area is small, development on land in the EIS area following closure of the air base has been minimal and extant structures are likely to be historic (i.e. at least 50 years old) (NPS 2002; OAHP n.d.). Comparison of historical and recent aerial imagery indicates that, with the exception of one office building recently added to the City of Moses Lake gun range, existing structures within the EIS area date from the 1940s to 1960 (USDA 1949, 1955, 1961). These structures are associated with air base and aviation development and operations during World War II and the Cold War and may meet NRHP eligibility criteria (NPS 2002).

A site visit was conducted on April 24, 2015 to obtain general information about existing landscape conditions and the built environment within the EIS area. The author traveled opportunistic transects by foot and by automobile, with access to restricted areas provided by City of Moses Lake and Port of Moses Lake personnel. Weather conditions were mild and breezy with partly cloudy skies. Notes and photographs are on file at CRC. Observations during field reconnaissance were consistent with expectations for a low potential for archaeological sites to be present due to geomorphic setting and past impacts to surface and near-surface sediments in the majority of the study area (Figures 4 – 7). The ground surface in the portion of the EIS area north of the SGL facility and east of Randolph Road appeared to have been subjected to less ground disturbance in the past than other areas.

Based upon review of historical air photos online and on file at ASPI Group in Renton, Washington, recent air photos, DAHP's historic inventory, and field observations, historic structures are present within the EIS area that have not been previously inventoried. These include Taxiway G, the gun revetment east of Taxiway G, the gun range on City of Moses Lake property, the Boeing facility on the east side of the airport (including the apron and compass pad, hangar, and associated outbuildings), the SAC Alert Center (including the building and aprons), and the alert hangar and apron currently used by Columbia Pacific Aviation. Table 5 lists the structures, construction dates, addresses, and parcel numbers. These structures should be inventoried and formally evaluated for NRHP eligibility prior to initiation of any development under the Planned Action.

Resources are typically defined as significant or potentially significant if they are identified as of special importance to an ethnic group or Indian tribe or if the resource is considered to meet certain eligibility criteria for local, state, or national historic registers, such as the NRHP. Based on NRHP assessment criteria developed by the National Park Service, historical significance is conveyed by properties:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important in prehistory or history [NPS 2002:2].

According to the NRHP guidelines, the "essential physical features" of a property must be intact for it to convey its significance, and the resource must retain its integrity, or "the ability of a property to convey its significance." The seven aspects of integrity are:

- Location (the place where the historic property was constructed or the place where the historic event occurred);
- Design (the combination of elements that create the form, plan, space, structure, and style of a property);
- Setting (the physical environment of a historic property);
- Materials (the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property);
- Workmanship (the physical evidence of the crafts of a particular culture or people during any given period of history or prehistory);

- Feeling (a property's expression of the aesthetic or historic sense of a particular period of time); and
- Association (the direct link between an important historic event or person and a historic property) [NPS 2002:44].

Historic structures within the EIS area may meet NRHP Criterion A based upon association with significant events (e.g., World War II and Cold War era defense) or Criterion C based upon significant engineering or architectural features. These structures generally retain integrity of location, feeling, and association but have varying levels of integrity of design, setting, materials, and workmanship due to changes to the structures and their surroundings.

Taxiway G connects the northeast end of Runway 4-22 to the southeast end of Runway 14L-32R and is only occasionally used. It serves the Boeing hangar and industrial park on the east side of the airport. According to the Port of Moses Lake (2014:1.26), it is 75 feet wide, composed of "8,150 feet of 8"-6"-8" PCC with a 4-inch thick asphalt overlay," has no lighting, and is in poor condition. It was originally designated taxiway 6 by the military (URS Corporation 2005:Appendix G).

The Gun Revetment is a large earthen embankment clad with horizontal wooden boards on its southeastern side (Figure 8). It is located near the north end of Taxiway G. This structure is visible on air photos from 1955 (Central Washington University 2015). Earlier air photos reviewed did not cover this area (USDA 1949).

The Gun Range east of Randolph Road was developed as a part of the military base (Figure 9). It consists of a large U-shaped earthen embankment enclosing a firing line and a building currently used for storage. Both of these are visible on air photos from 1955 (Central Washington University 2015) but not within the coverage of earlier photos reviewed. The gun range is currently owned by City of Moses Lake and used by its police department. An office building was added in 1999 (Grant County Assessor 2015).

The Boeing Company's facilities at the airport include a large hangar, another building to the east, and smaller outbuildings and infrastructure (Figure 10), as well as fenced and unfenced apron areas west of these buildings on the east side of the airport (Port of Moses Lake 2014). Most of this complex had been built by 1955 (Central Washington University 2015).

The Alert Hangar Apron and Alert Hangars, now occupied by Columbia Pacific Aviation, were built to facilitate runway access for rapid response fighter aircraft. They are located near the southeast end of Runway 14L-32R (Figure 11). The apron has an area of approximately 12,300 square yards. The Alert Hangars (Building 4006) are a series of connected box hangars on the southeast side of the apron (Port of Moses Lake 2014:Exhibit 1U). The hangars and apron were built by 1955 (Central Washington University 2015).

The Strategic Air Command Alert Center and Christmas Tree Aprons (Figure 12) were built in 1960 (Grant County Assessor 2015; USDA 1961). Chasteen (2007:3) notes that the Alert Center Building was used by pilots awaiting flight orders. The Christmas Tree Aprons derive their name from their appearance from the air, and consist of 11 small aprons totaling about 46,200 square yards in area. They are connected to a taxiway at the southeast end of Runway 14L-32R. B-52s were staged here on alert during the Cold War (Port of Moses Lake 2014).

Significant Impacts

Because the study area is considered to have a low potential to contain intact archaeological deposits, no significant impacts to archaeological sites are anticipated. No precontact or historic period archaeological sites have been identified within the study area. However, significant impacts to archaeological sites could occur if development disturbs as-yet unknown archaeological sites. Significant impacts to historic sites could be generated by demolition, removal, or other physical alterations to historic structures.

Impacts Common to All Alternatives

Only a small fraction of the EIS area has been surveyed for archaeological or historic sites (Rader 1998; Schumacher et al. 2010). These two surveys were confined to the Randolph Road NE and 7 Road NE corridors. No archaeological sites have been recorded within the EIS area One historic structure, a drainage ditch at the Alert Center, has been recorded within the EIS area but was determined not eligible for the NRHP. Development under each of the alternatives would not generate impacts to previously recorded archaeological sites or significant impacts to previously recorded historic sites.

Alternative 1

Under this alternative, heavy manufacturing uses would occupy 528 acres and develop at a floor area ratio (FAR) of 0.20, while warehouse uses would occupy 239 acres and develop at a FAR of 0.25. All buildings would be one-story, with the FARs taking into account the road frontage landscaping required by City of Moses Lake as well as the 8 percent of gross area in landscaping required by Grant County. This would result in approximately 8,809,647 square feet of new buildings. Cut and fill for development under this alternative is estimated at 2,731,640 cubic yards with an average depth of 2 feet. If as-yet unrecorded archaeological sites are present within the study area, they would be on or near the present-day ground surface within the vertical limits of cut and fill or other ground-disturbing work such as trenching or building for utilities, transportation corridor construction, building foundations, stormwater management, grading, grubbing with machines, or planting. Demolition, removal, or other physical alteration of any structures over 50 years old would impact historic sites.

Alternative 2

Under this alternative, light manufacturing uses would occupy 528 acres and develop at a FAR of 0.25 while technology/laboratory uses would occupy 239 acres and develop at a FAR of 0.30. All buildings would be one-story, with the FARs taking into account the road frontage landscaping required by City of Moses Lake as well as the 8 percent of gross area in landscaping required by Grant County. This would result in approximately 10,085,324 square feet of new buildings. Cut and fill is expected to be the same as for Alternative 1, estimated at 2,731,640 cubic yards with an average depth of 2 feet. If as-yet unrecorded archaeological sites are present within the study area, they would be on or near the present-day ground surface within the vertical limits of cut and fill or other ground-disturbing work such as trenching or building for utilities, transportation corridor construction, building foundations, stormwater management, grading, grubbing with machines, or planting. Demolition, removal, or other physical alteration of structures over 50 years old would impact historic sites. Given the slightly higher density of development proposed under this alternative, it is considered somewhat more likely for as-yet unrecorded archaeological or historic sites to be impacted than under Alternative 1.

Alternative 3 (No Action Alternative)
Because no action is proposed under Alternative 3 at this time, no impacts to cultural resources would be generated. Under this alternative, there would be a continuation of existing conditions. Continued existing operations within the EIS area would not affect any recorded cultural resources.

Mitigation Measures:
The following mitigation measures could be implemented to help avoid and manage significant impacts to cultural resources within the Employment Center:

- Initiate formal consultation with Tribes in Washington State to determine which Tribes have an interest in the study area. CRC contacted cultural resources staff of the Wanapum Tribe, the Confederated Colville Tribes, and the Confederated Tribes and Bands of the Yakama Reservation to inquire about cultural resources information or concerns specific to the EIS area (Attachment A). This technical correspondence is not intended as a substitute for government-to-government consultation.
- Establish a protocol/checklist for review of projects that includes a form letter for DAHP.
- Conduct cultural resources surveys prior to specific development actions under the proposal.
- Document and evaluate historical significance of structures within the study area that are over 50 years old prior to specific development actions.
- Establish a team to manage the critical area designation of archaeological sites. The team can be responsible for data management and consultation with Tribes, agencies, developers, and/or other stakeholders. Assign a member of the team to search for grants and other funding sources that could begin to collecting data to improve the understanding of precontact land use in the study area.
- Consider establishing a heritage program that helps guide development by incorporating a heritage theme in the Employment Center.
- Partner with existing businesses or agencies (e.g., Port of Moses Lake, ASPI Group) with a strong interest in history, and which likely maintain good historical records.

Should any potentially significant archaeological or historic sites be encountered in development under the proposal and it is not possible to avoid them, impacts would be generated. These impacts could potentially be minimized through development and implementation of mitigation measures appropriate to the nature and extent of discovered sites. Mitigation measures may include one or more of the following:

- Limiting the magnitude of the proposed work;
- Modifying proposed development through redesign or reorientation to minimize or avoid further impacts to resources;
- Rehabilitation, restoration, or repair of affected resources;
- Preserving and maintaining operations for any involved significant historic structures;

- Archaeological monitoring, testing, or data recovery excavations;
- Documentation of historic elements of the built environment through photographs, drawings and narrative, at the appropriate level based upon Department of Archaeology and Historic Preservation standards (DAHP 2010).

In the event that ground disturbing or other activities do result in the inadvertent discovery of archaeological deposits, work should be halted in the immediate area and contact made with the DAHP in Olympia. Work should be halted until such time as further investigation and appropriate consultation is concluded. In the unlikely event of the inadvertent discovery of human remains, work should be immediately halted in the area, the discovery covered and secured against further disturbance, and contact effected with law enforcement personnel, consistent with the provisions set forth in RCW 27.44.055 and RCW 68.60.055.

Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to cultural resources are anticipated to be generated by the proposal. With the implementation of a protocol for review of projects, and establishment of a cultural resources management program, it should be possible to prevent any significant unavoidable impacts. Should any potentially significant archaeological or historic sites be discovered and it is not possible to avoid them, impacts would be generated. However, it is expected that these impacts could potentially be minimized through development and implementation of mitigation measures appropriate to the nature and extent of discovered sites.

Limitations of this Assessment

No cultural resources study can wholly eliminate uncertainty regarding the potential for prehistoric sites, historic properties or Traditional Cultural Properties (TCPs) to be associated with a project. The information presented in this report is based on professional opinions derived from our analysis and interpretation of available documents, records, literature, and information identified in this report, and on our field investigation and observations as described herein. Conclusions and recommendations presented apply to project conditions existing at the time of our study and those reasonably foreseeable. The data, conclusions, and interpretations in this report should not be construed as a warranty of subsurface conditions described in this report. They cannot necessarily apply to site changes of which CRC is not aware and has not had the opportunity to evaluate.

It should be recognized that this assessment was not intended to be a definitive investigation of potential cultural resources concerns within the project area. Within the limitations of scope, schedule and budget, our analyses, conclusions and recommendations were prepared in accordance with generally accepted cultural resources management principles and practice in this area at the time the report was prepared. We make no other warranty, either express or implied. These conditions and recommendations were based on our understanding of the project as described in this report and the site conditions as observed at the time of our site visit.

This report was prepared by CRC for the sole use of EA. Our conclusions and recommendations are intended exclusively for the purpose outlined herein and the project indicated. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or re-use of this document, including findings, conclusions, and/or recommendations, is at the sole risk of said user. If there is a substantial lapse of time between the submission of this report and the start of construction, or if conditions have changed due to project (re)design, or appear to be different from those described in this report, CRC should be notified so that we can review our report to determine the applicability of the conclusions and recommendations considering the changed conditions.

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Figures and Tables

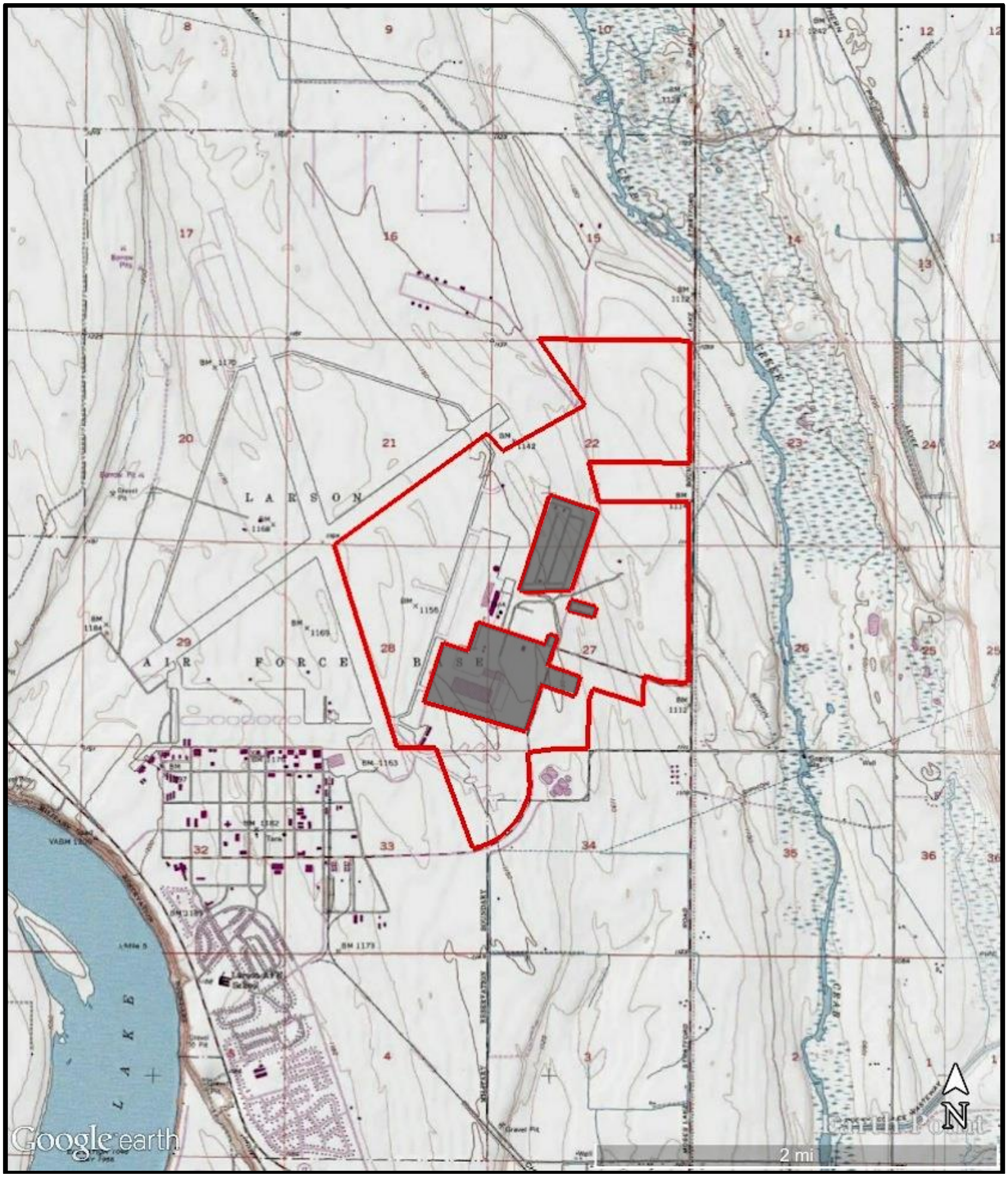

Figure 1. EIS area marked on portion of Moses Lake North, WA (USGS 1978) 7.5-Minute topographic quadrangle. Shaded areas are not included in the EIS.

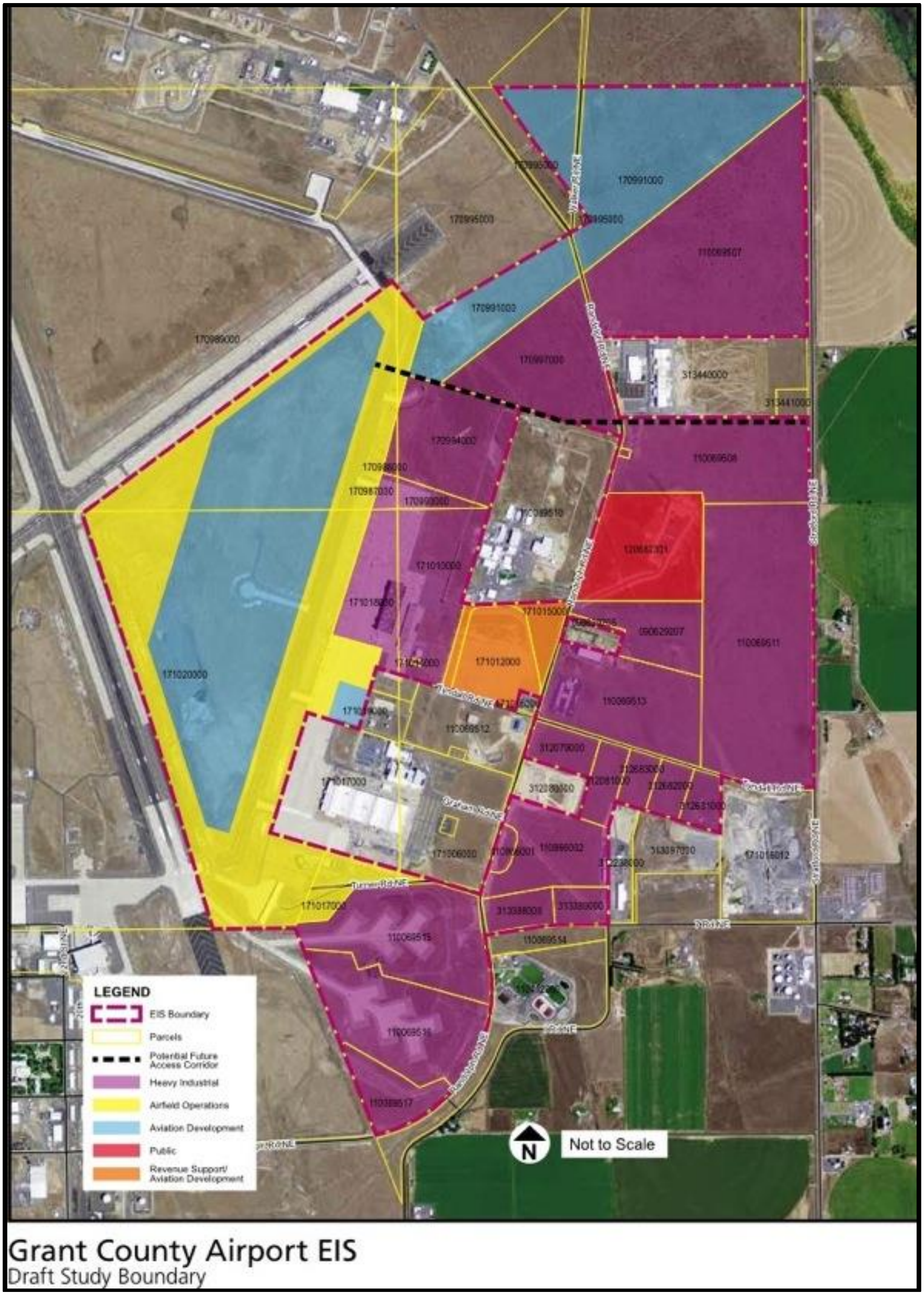

Figure 2. Aerial imagery marked with existing zoning, parcels, and EIS boundary, provided by EA.

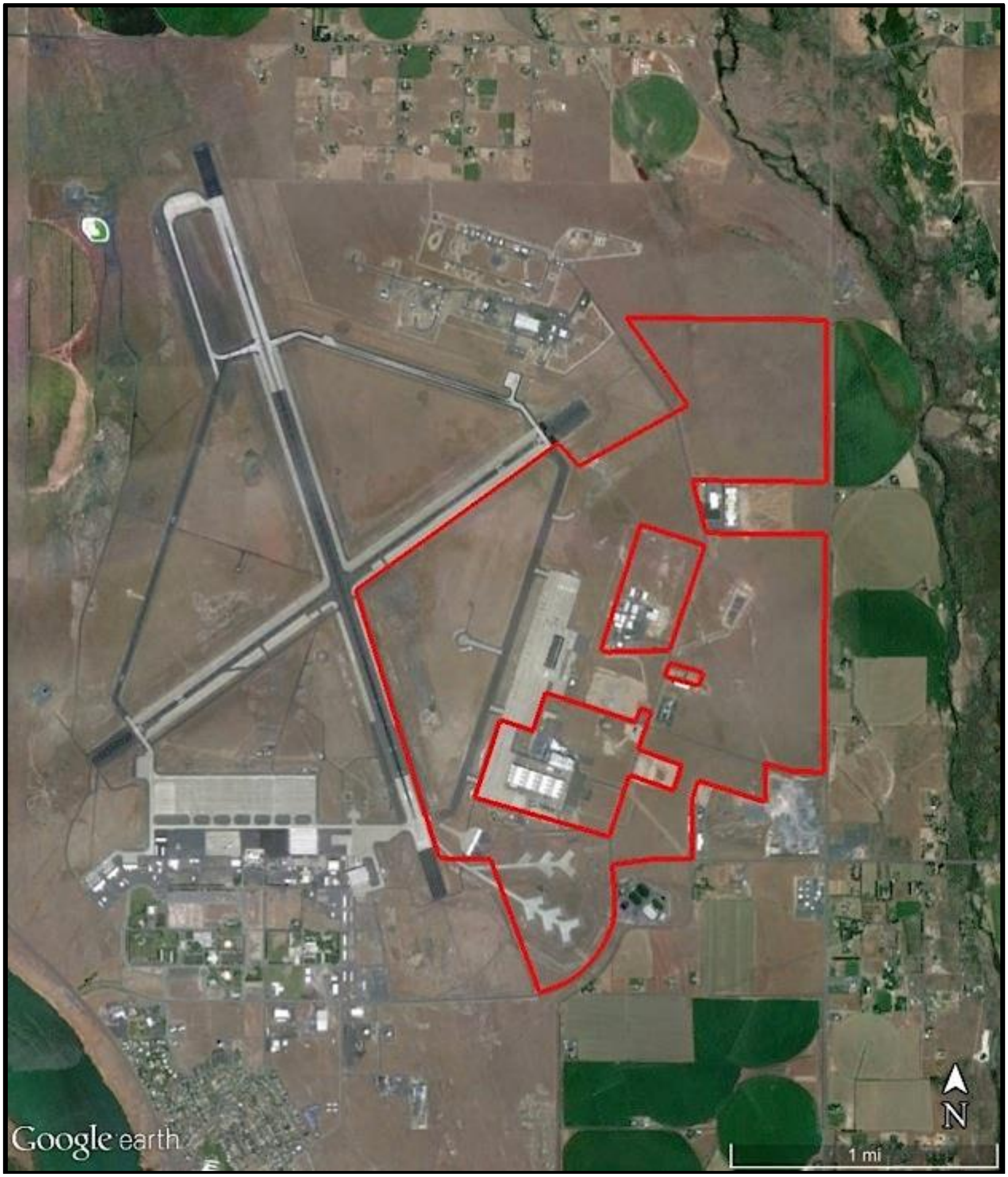

Figure 3. Aerial imagery marked with EIS boundary (base map: Google Earth).

Table 1. Land patents recorded within the EIS area (BLM 2015), all located in T. 20 N., R. 28 E., W.M. No patents were found in Section 28.

Name	Date	BLM Serial No.	Authority	Sections and/or Aliquots in Proposal	Total Acres
Northern Pacific Railroad Co.	1/3/1896	WAYAA 000001	Grant-RR Northern Pacific	Sections 21, 27, and 33	377,355.45
Albert Carl Muller and George A. Alexander	3/21/1914	WAWA 0005681	Sale-Cash Entry	S½, Section 22	320
William J. Dols	6/17/1915	WAWA 0005682	Sale-Cash Entry	S½ of NE ¼ and S½ of NW¼, Section 22	320
Northern Pacific Railway Co.	9/28/1916	WAORAA 008131	Grant-RR Northern Pacific	N½, Section 34	1100.07

Table 2. Reports of cultural resources investigations on file at DAHP within a distance of approximately one mile from the study area.

Author	Date	Title	Results and Recommendations
Rader	1998	Cultural Resources Survey for a Proposed Cascade Natural Gas Pipeline Project Near Moses Lake	Background research and pedestrian survey did not identify any archaeological or historic sites. No further work recommended.
Hale and Kelly	2001	Cultural Resources Inventory of 16 Cellular Communication Tower Lease Areas, Morrow and Umatilla Counties, Oregon and Benton, Chelan, Grant, Kittitas and Yakima Counties, Washington	Background research and pedestrian survey did not identify any archaeological or historic sites. No further work recommended.
Komen	2001	A Cultural Resources Survey for Segments of Three Roads: 11 SW Road, Q-NE Road and Stratford Road	Background research and pedestrian survey did not identify any archaeological or historic sites. No further work recommended.
Emerson and Axton	2002	A Cultural Resources Survey of Two Road Improvement Projects and One Sidewalk Improvement Project for Grant County Public Works	Background research and pedestrian survey did not identify any archaeological or historic sites. No further work recommended.
Sharley and Crisson	2005	A Cultural Resources Survey of Grant County's Proposed Stratford Road and 4-NE Road Projects	Background research and pedestrian survey identified one historic site (a canal) and no archaeological sites. The canal was recommended eligible for the NRHP but was not anticipated to be affected by the project. No further work recommended.
Kopperl and Heideman	2008	Cultural and Historical Resources Discipline Report, SR17 and SR282 Widening: Moses Lake to Ephrata	Background research, pedestrian survey, and shovel probes found 11 archaeological sites, 28 historic buildings, and one archaeological isolate. One archaeological site over 2 miles from the current proposal was recommended eligible for the NRHP. It was recommended that the project avoid disturbing the site or, in the event avoidance was not feasible, data recovery excavations be conducted.
Schumacher et al.	2010	Cultural Resources Assessment for the Feeder RA-9 Rebuild/SGL Project, Moses Lake	Background research, pedestrian survey, and shovel probes did not identify any archaeological or historic sites. No further work recommended.

Author	Date	Title	Results and Recommendations
Sharpe	2010	Cultural Resource Technical Report for the SGL Automotive Carbon Fiber Facility	Background research, pedestrian survey, and shovel probes did not identify any archaeological or historic sites. No further work recommended.
Huntington Steinkraus and Steinkraus	2014	Cultural Resource Survey of the 7NE Road Widening Project	Background research and pedestrian survey did not identify any archaeological or historic sites. No further work recommended.

Table 3. Archaeological sites recorded within a distance of approximately two miles from the project on file at DAHP.

Site Number	Site Name	Site Type	Location Relative to Study Area	Historic Register Status	Potential Impacts due to Proposal
45GR1221	Nagel or Willoughby Well	Historic agriculture	1.75 miles E	Unevaluated.	None.
45GR1971		Historic debris scatter / concentration; Historic structure unknown	2 miles W	Recommended not eligible for NRHP.	None.
45GR1977	Old Neppel Road	Historic road	1.75 miles WSW	Unevaluated.	None.
45GR3359		Historic debris scatter / concentration	1.5 miles NW	Recommended not eligible for NRHP.	None.
45GR3360		Historic debris scatter / concentration	1.16 miles W	Recommended not eligible for NRHP.	None.
45GR3361		Historic debris scatter / concentration	1.15 miles W	Recommended not eligible for NRHP.	None.
45GR3362		Historic debris scatter / concentration	1.2 miles W	Recommended not eligible for NRHP.	None.
45GR3364		Precontact isolate	2 miles W	Recommended not eligible for NRHP.	None.

Table 4. Historic structures previously inventoried within approximately one mile from the project.

Historic Name	Address	Built Date	Historic Function	Historic Register Status	Potential Impacts due to Proposal
8 Place Hangar Drainage Ditch	Randolph Rd near Tyndall Rd	1952	Other (drainage ditch)	Determined not eligible for NRHP.	None.
Alert Center Building Drainage Ditch	8868 Turner Rd	1952	Other (drainage ditch)	Determined not eligible for NRHP.	None. Ditch is within EIS area but has already been determined not eligible for NRHP.
Chicago, Milwaukee, St. Paul and Pacific Railroad Branch Line	RR ROW between 22nd Ave NE and Kinder Rd NE	1940	Transportation – Rail-related	Determined not eligible for NRHP.	None.
	507 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	509 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	511 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	513 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.

Historic Name	Address	Built Date	Historic Function	Historic Register Status	Potential Impacts due to Proposal
	515 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	517 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	519 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	521 Castle Dr	1961	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	1150 Larson Blvd	1951	Domestic – Single Family House	Determined not eligible for NRHP.	None.
	1402 East Craig	2003	Commerce/Trade – Business	Unevaluated.	None. Resource is outside study area and is not historic in age.
	7988 Andrews St NE	1957	Transportation – Air-related	Determined not eligible for NRHP	None.
Larson Air Force Base: In-Flight Kitchen	4306 Arnold Dr NE	1954	Defense – Air Facility	Determined eligible for NRHP.	None. Resource is outside study area and immediate viewshed.
Larson Air Force Base Hospital	6378 Arnold Dr NE	1946	Health Care – Hospital	Determined not eligible for NRHP.	None.
Larson Air Force Base: Bachelor Officer Quarters	6379 Arnold Dr NE	1959	Domestic – Multiple Family House	Determined not eligible for NRHP.	None.
Dover Feeder DR20	Hwy 17 and Newell St	1941	Industry / Processing / Extraction – Energy Facility	Determined not eligible for NRHP.	None.

Figure 4. Typical conditions on undeveloped between Randolph Rd and Stratford Rd; view is to the east.

Figure 5. Typical conditions on undeveloped land in the airport; view is to the northeast.

Figure 6. Typical conditions on undeveloped land in the northeastern part of the EIS area; view is to the northeast.

Figure 7. Former runway edge; view is to the northwest.

Table 5. Uninventoried historic structures within the EIS area.

Name	Address	Parcel (s)	Built Date	Comments
SAC Alert Center	6802 NE Randolph Rd	110069515, 110069516	1960	Includes alert center building and aprons to north and south.
Boeing Co.	8998 Tyndall Rd NE	171010000, 171014000, 170987000,	Pre-1955	Includes hangar, buildings to east, and apron and compass pad adjacent to west side of Taxiway G.
Gun Revetment	N/A	170994000	Pre-1955	Wooden and earthen structure formerly used for discharging guns.
Taxiway G	N/A	171020000, 170989000, 170995000	ca. 1942	Taxiway connecting runways 22 and 32. Part of original taxiway system.
Gun Range	8213 Randolph Rd NE	120682301	Pre-1955	Includes large earthen embankment, firing line, and storage building.
Alert Hangars and Alert Apron	Turner St	171020000	ca. 1955	Includes Columbia Pacific Aviation hangars and apron at end of Taxiway H.

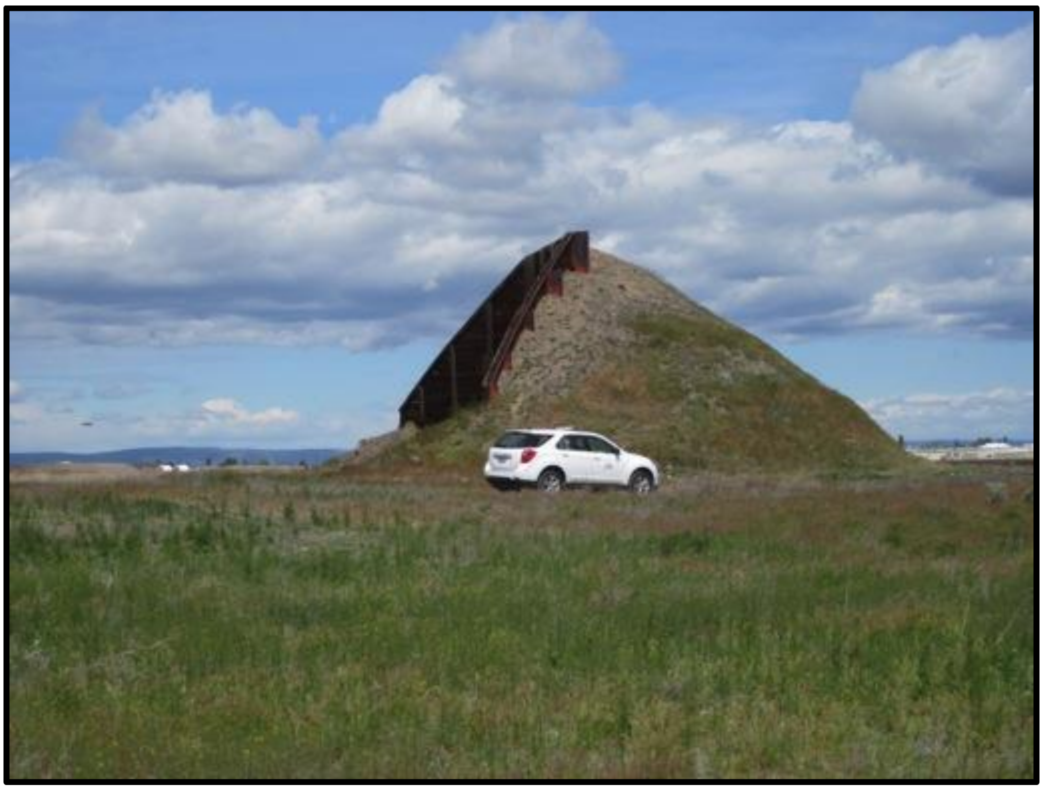

Figure 8. Gun revetment on airport property; view is to the northwest.

Figure 9. Storage building and gun range on City of Moses Lake property; view is to the northwest.

Figure 10. Boeing Company buildings at 8998 Tyndall Rd NE; view is to the northwest.

Figure 11. Apron and northern part of Alert Hangars; view is to the southeast.


Figure 12. SAC Alert Center building and aprons on ASPI Group property; view is to the southeast.

Attachment A. Project correspondence between CRC and cultural resources staff of the Wanapum, Colville, and Yakama tribes.

Cultural Resource Consultants, Inc.

April 7, 2015

Colville Confederated Tribes
Guy Moura, Cultural Resources
PO Box 150
Nespelem, WA 99155-0150

Re: Cultural Resources Assessment for the Grant County International Airport Project, Moses Lake, Grant County, WA

Dear Guy:

I am writing to inform you of a cultural resources assessment for the above referenced project and to seek additional information about the project area the Tribe may have that is not readily available through other written sources. The project is located at 7810 Andrews Street NE, Port of Moses Lake in Moses Lake, Grant County, Washington. The Port of Moses Lake, Grant County and the City of Moses Lake are preparing a Planned Action EIS for approximately 400 acres of Port-owned land and adjacent properties in and near Moses Lake.

We are in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation, review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo.

We are aware that not all information is contained within published sources. Should the Tribe have additional information to support our assessment, we would very much like to include it in our study. Please contact me should you wish to provide any comments. I appreciate your assistance in this matter and look forward to hearing from you.

Sincerely,

Glenn D. Hartmann
President/Principal Investigator

Cultural Resource Consultants, Inc.

April 7, 2015

Wanapum Tribe
Rex Buck, Cultural Resources
PO Box 275
Beverly, WA 99321

Re: Cultural Resources Assessment for the Grant County International Airport Project, Moses Lake, Grant County, WA

Dear Rex:

I am writing to inform you of a cultural resources assessment for the above referenc ed project and to seek additional information about the project area the Tribe may have that is not readily available through other written sources. The project is located at 7810 Andrews Street NE, Port of Moses Lake in Moses Lake, Grant County, Washington. The Port of Moses Lake, Grant County and the City of Moses Lake are preparing a Planned A ction EIS for approximately 400 acres of Port-owned land and adjacent properties in and near Moses Lake.

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Sincerely,

Glenn D. Hartmann
President/Principal Investigator

Cultural Resource Consultants, Inc.

April 7, 2015

Confederated Tribes and Bands of the Yakama Nation
Mr. Johnson Meninick
PO Box 151
Toppenish, WA 98948

Re: Cultural Resources Assessment for the Grant County International Airport Project, Moses Lake, Grant County, WA

Dear Johnson:

I am writing to inform you of a cultural resources assessment for the above referenced project and to seek additional information about the project area the Tribe may have that is not readily available through other written sources. The project is located at 7810 Andrews Street NE, Port of Moses Lake in Moses Lake, Grant County, Washington. The Port of Moses Lake, Grant County and the City of Moses Lake are preparing a Planned Action EIS for approximately 400 acres of Port-owned land and adjacent properties in and near Moses Lake.

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Sincerely,

Glenn D. Hartmann
President/Principal Investigator

PO Box 10668, Bainbridge Island, WA 98110
Phone 206.855.9020 - info@crcwa.com