Spring 2010

Bellingham International Airport expansion: environmental impact assessment

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Bellingham International Airport Expansion

Environmental Impact Assessment: ESTU 436
Spring 2010
Huxley College of the Environment

DIGITAL RELEASE

Environmental Impact Assessment

Huxley College of the Environment

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Signature _____ Jean Melious

Date 6 / 1 / 2010

DEAR CITIZENS LETTER

Dear concerned citizen:
This environmental impact assessment (EIA) is to evaluate the possible environmental impacts of expanding upon the existing Bellingham International Airport (BLI) as best as possible. This document was also created in compliance with the State Environmental Policy Act (SEPA) and follows the Washington Administrative Code (WAC) 197-11.

A group of Western Washington University students prepared this document as an academic exercise for Environmental Studies 436 under the supervision of Jean Melious. This EIA is an academic version of SEPA's Environmental Impact Statement and should not be used as an official document.

The proposed action for the expansion of the Bellingham International Airport encompasses a 20 year period with two different phases for creating new building sites, airplane hangars, and repaving the existing runway. The BLI has become a main attraction for Canadian tourists and travelers and is becoming more crowded every year. The expansion would not only be able to support the existing travelers, but be able to bring in more customers and different airlines.

There are two alternative actions that can be followed instead of the proposed action. There is the first alternative action and then the no action alternative. The first alternative action will achieve the proposed actions objectives, but with less environmental costs. The no action alternative will leave the Bellingham International Airport operating as it is with no expansion of the runway, building sites, or parking.

The purpose of this environmental assessment is to identify the possible environmental impacts of airport construction and expansion of the proposed action. Choosing not to expand the Bellingham International Airport would result in continuation of the current airport operations, the no alternative action. It would not lose any business, but it would not be able to grow either.

This document utilizes past reports, documents, and scientific studies on past expansions of the BLI, current Port plans for the BLI, green house gas emissions, noise reduction, storm-water runoff, and low impact-development. However, although there are many documents out there on the proposed action, there are very few studies within specified areas to create baselines to measure significant impacts. Of the information and studies that are available regarding airport expansions, we used thoroughly. We hope this document brings clarity and understanding about the current Bellingham International Airport and the environmental impacts of expanding upon it.

Sincerely,

The Bellingham International Airport Expansion EIA Team

Marie Phillips, Stevie O'Clock, Khai Bhagwandin, Travis Johnson & Zeck Donahue

WESTERN WASHINGTON UNIVERSITY

Bellingham International Airport Expansion

Environmental Impact Assessment

Environmental Studies 436
Professor Jean Melious

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This document represents a class project carried out by students of Western Washington University, Huxley College of the Environment. It has not been undertaken at the request of any people representing local governments or private individuals, nor does it necessarily represent the opinion or position of individuals from government or the private sector.

Huxley College of the Environment
Spring 2010

FACT SHEET

Title
Bellingham International Airport Expansion

Description of Project
The Bellingham International Airport Expansion Project seeks to improve and expand the capacity of the airport and the adjacent airport related and airport compatible uses. This project will accomplish this by rehabilitating the runway and widening the taxiway, building more hangars, expanding the terminal and the air cargo area, creating an additional parking lot, developing an area for rental car agencies and lodging, and expanding the light industrial area.

Description of Location
The Bellingham International Airport (BLI) is located in Northwest Washington in Whatcom County. It lies north of the City of Bellingham and south of the U.S./Canadian border (Port of Bellingham, 1998). This site is located within Sections 10, 11, 14, and 15 of Township 38 North, Range 2 East, W.M. It is situated within the City of Bellingham Urban Growth Area (UGA) (Port of Bellingham, 2010). The latitude and longitude are approximately 122-32-15.1000W/48-47-33.7000N according to the latest Federal Aviation Administration data, and the physical address is 4255 Mitchell Way, Bellingham, WA 98226, and it is located just west of Interstate-5 (Airport Data, 2010).

Proposal Entity
Huxley College of the Environment

Lead Agency
Jean Melious, LLC

Related Permits and Laws
Whatcom County

- Preliminary and General Binding Site Plan
- Preliminary Planned unit Development (PUD)
- Whatcom County and City of Bellingham Parking Standards
- Whatcom County and Bellingham Landscape Standards
- Whatcom County Airport Operations Setback Requirements
- Whatcom County Critical Areas Ordinance
- Whatcom County Land Division Regulations

Washington State Department of Ecology

- Section 401 Water Quality Certification
- CZM Consistency Certification

Washington State Department of Fish and Wildlife

- Hydraulic Project Approval

U.S. Army Corps of Engineers

- Section 404 Nationwide Permit

Other

- Federal Aviation Administration (FAA) Regulations
- Transportation Security Administration (TSA) Regulations

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600 East Holly Street
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EXECUTIVE SUMMARY

The Bellingham International Airport (BLI) was built in 1941 and is currently owned and operated by the Port of Bellingham. Within Whatcom County (see Figure 1), BLI is the largest airport, facilitating general aviation, small package freight, commercial air transport, and business and commuter passenger air transportation. In order to meet the growing demands of these services, the Port of Bellingham has proposed an expansion of BLI. The Planned Unit Development (PUD) is projected to be completed over 20 years (first 2 phases) and the third phase is set for any future development projects (see Figure 3). With the Preliminary Binding Site Plan (PBSP) the objective of the development is establish areas in which development will be take place to facilitate airport-dependent, airport-related, light-industrial, and commercial use compatible with the airport's operations (see Figure 2).

Bellingham International Airport Overview Map

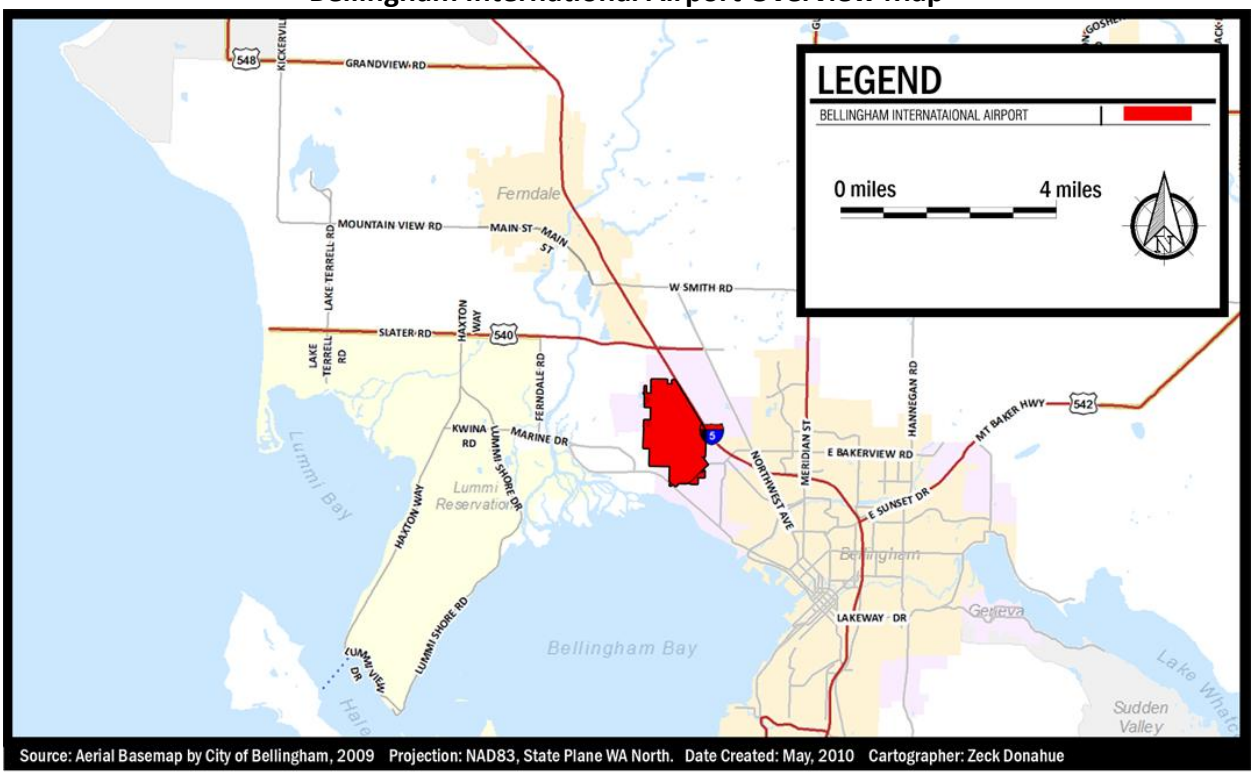

Figure 01- Map showing the location of Bellingham International Airport.

The purpose of this document is to take an analytical look at the environmental and social impacts of the proposed construction and expansion of Bellingham International Airport. The analysis will assess the effects that these changes will have on the land, air, water, plant and animal life. In addition, a consideration of the effects on noise, energy and natural resources, residential areas, recreation, light and glare, transportation, cultural preservations, public services, and aesthetic values of the area. The importance of this environmental impact assessment is to evaluate the impacts and inform the public of these alterations.

The proposals for the further development and expansion of the airport are compared against the outcome of an alternative, and a no action alternative. The impact to each factor cannot be solved or mitigated by one single alternative, so several alternatives have been developed to mitigate where appropriate. Under the development proposal, the largest issue is the intention of filling approximately 8.63 acres of direct wetland. To mitigate this impact there will be off-site wetlands created to replace the wetland services and values that will be impacted and lost on the BLI property. In addition the purchase of carbon credits to offset this environmental harm will be purchased. The overall efforts are aimed to reach the goals of the of the airport expansion, while doing so with a non-significant level of harm to the local society and environment.

The expansion of the airport is expected to manage an increase of 15,000 passengers a month. To meet this growth, there is going to be a shift from the Boeing MD-80 to larger Boeing 747 airplanes. There is controversy and uncertainty around the affect that this will have on the noise will have on the neighboring residential areas. Another topic of controversy is whether or not there will be an increase in the light and glare coming from the airport and if so, is the change going to be significant. This is will be hard to assess due to the lack of a baseline measure.

Bellingham International Airport Proposed Development Map

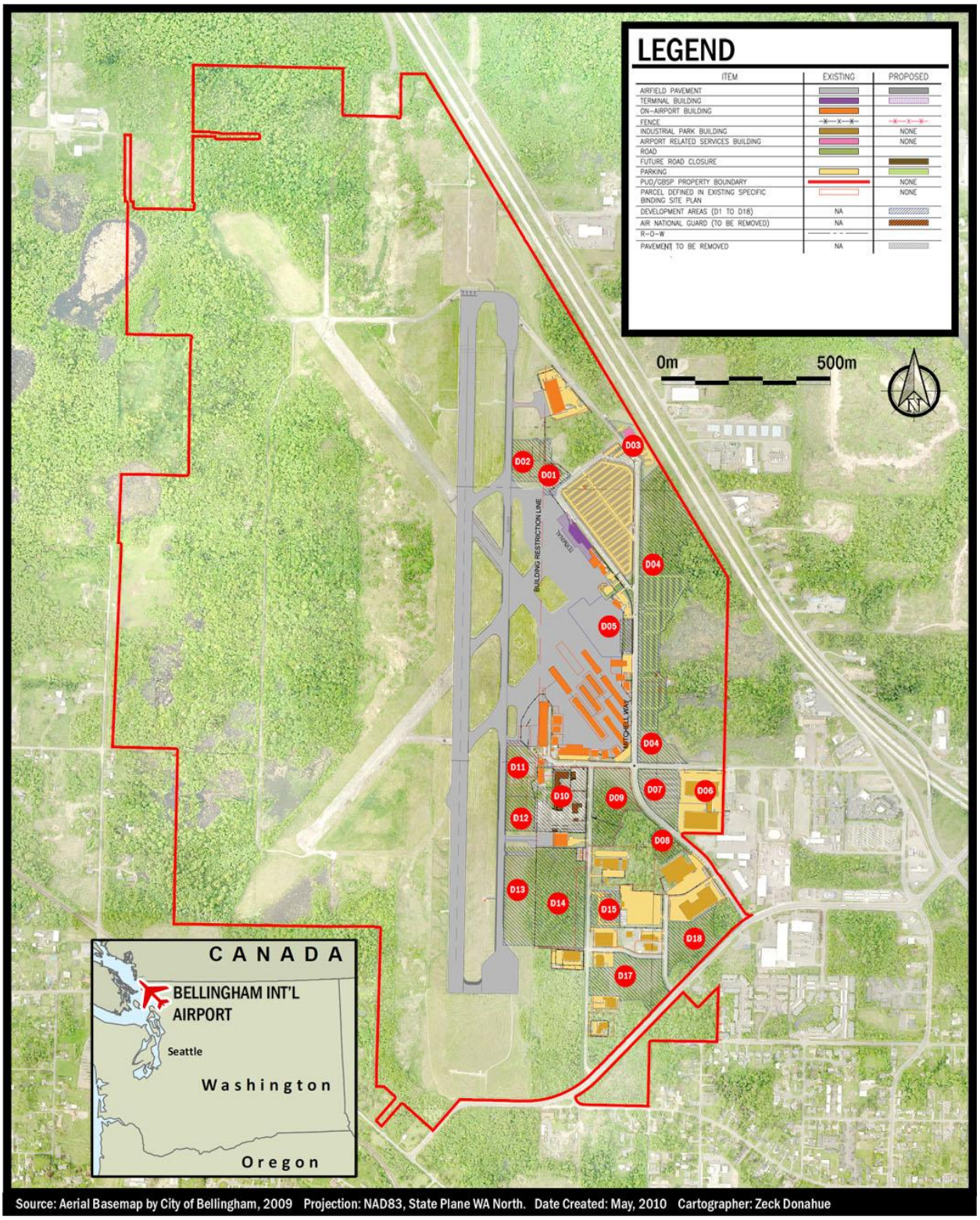

Figure 02- Map indicating the proposed development sites of the Bellingham International Airport expansion.

Bellingham International Airport Phase of Development Map

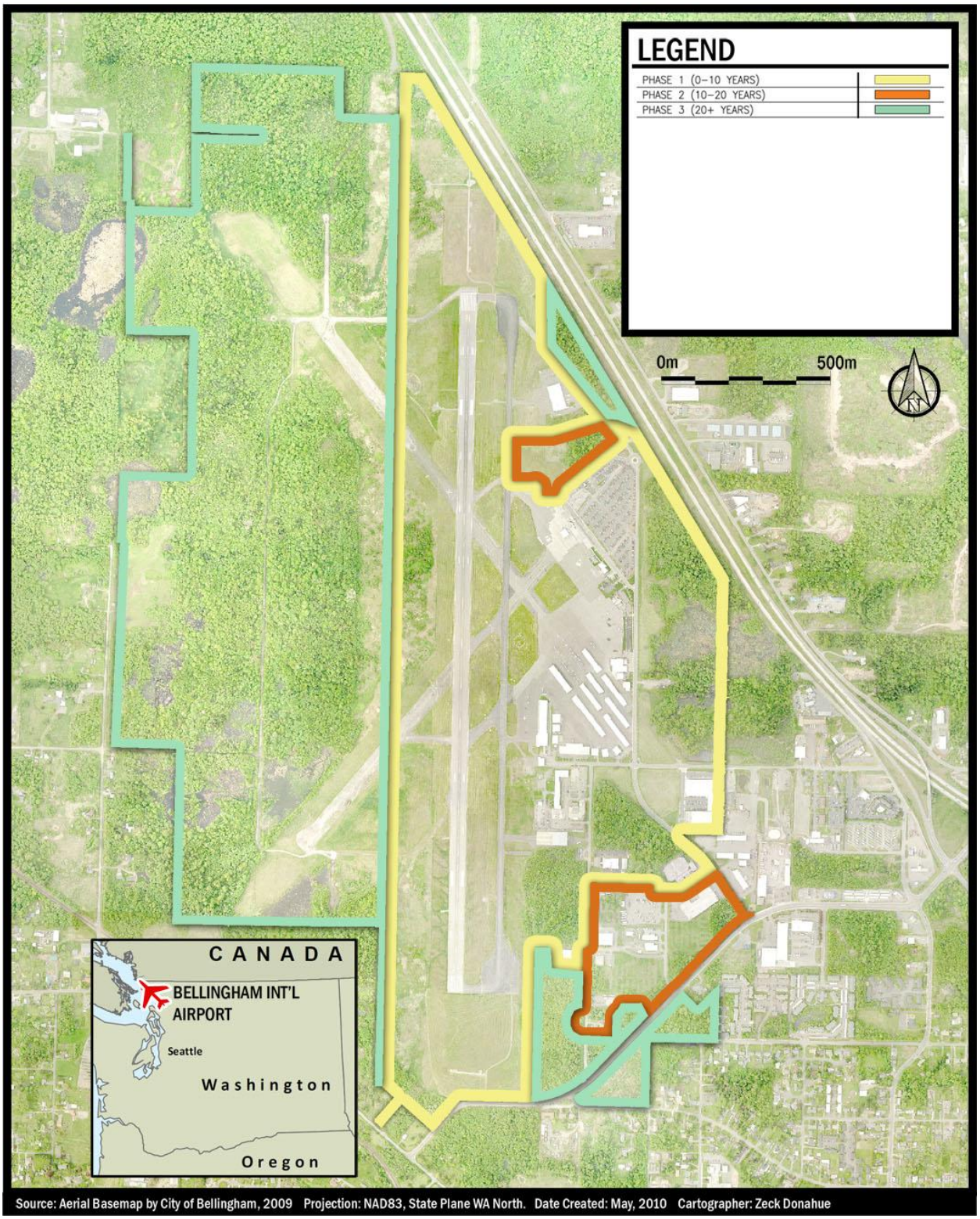

Figure 03- Map showing the different phases of development in 10 year increments at the Bellingham International Airport expansion.

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GLOSSARY OF TECHNICAL TERMS, ACRONYMS AND ABBREVIATIONS

Airplane Design Group (ADG): A grouping of airplanes based on wingspan or tail height. Where an airplane is in two categories the highest category will be used. Each category requires different runway and taxiway widths.

Group #	Tail Height (ft)	Wingspan (ft)	Runway Width (ft)	Taxiway Width (ft)
I	<20	<49	100	25
II	20 - <30	49 - <70	100	35
III	30 - <45	70 - <118	100 – 150	50
IV	45 - < 60	118 - < 171	150	75
V	60 - <66	171 - <214	150	75
VI	66 - <80	214 - <262	200	100

Source: Federal Aviation Administration

Airport Classes: A classification that designates airports based on the largest aircraft that can be accommodated by that airport.

Type of Air Carrier Operation	Class 1	Class 2	Class 3	Class 4
Scheduled Large Air Carrier Aircraft (30+ seats)	X			
Unscheduled Large Air Carrier Aircraft (30+ seats)	X	X		X
Scheduled Small Air Carrier Aircraft (10-30 seats)	X	X	X	

Carbon Dioxide (CO2): A greenhouse gas that is a part of the atmosphere and is colorless and odorless. It is a product of fossil fuel combustion and other processes and contributes to global warming. The global warming potential (GWP) of other greenhouse gases is measured in relation to that of carbon dioxide (EIA, 2010).

Carbon Dioxide Equivalent: This is equal to the amount of carbon dioxide that would have to be emitted into the atmosphere to produce the same estimated radioactive forcing as another gas. This is measured by multiplying the weight of the gas being measured by its estimated global warming potential (GWP) (EIA, 2010).

Check Dams: a small dam designed to reduce flow velocity and control soil erosion.

Climate Change: A term used to refer to climatic inconsistency, such as a change from one prevailing climatic condition to another. This sometimes use synonymously with global warming, but climate change usually includes a broader range of climatic changes (EIA, 2010).

Detention Facility: A pond that is used to manage storm water runoff to prevent flooding, erosion, or excessive pollutants in the storm water from going into a major body of water. It is also used to filter and treat polluted storm water.

Greenhouse Gases (GHGs): A term that refers to a group of gases such as water vapor, carbon dioxide, nitrous oxide, methane, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride that are transparent to solar (short-wave) radiation but opaque to infrared (long-wave) radiation. These gases prevent this long-wave radiant energy from leaving the earth's atmosphere, which tends to warm the atmosphere (EIA, 2010).

Low Impact Development (LID): Uses new techniques such as pervious concrete and rain barrels that are highly effective at controlling storm water pollution and protecting developing watershed.

Mulch Netting: Mulching and matting protect the soil surface from the forces of raindrop impact and overland flow. Mulch and mats foster the growth of vegetation, reduce evaporation, insulate the soil, and suppress weed growth.

Part 139: A Federal Aviation Administration regulation that requires the FAA to issue certificates to airports that serve scheduled and unscheduled aircraft with more than 30 seats, serve scheduled aircraft with between 9 and 31 seats, and the FAA Administrator requires to have a certificate. In part 139.315, aircraft rescue and firefighting standards are established for airports based on their index.

Index	Aircraft Length (ft)
Index A	< 90
Index B	90 - < 126
Index C	126 - < 159
Index D	159 - < 200
Index E	200

Perch: A localized zone of standing water.

Silt Fencing: A fence that allows for water to pass through but catches eroded sediment so that the soil particles are retained and not lost.

Abbreviations
BLI: Bellingham International Airport
COB: City of Bellingham
LID: Low Impact Development
NRCS: Natural Resource Conservation Service
USDA: United States Department of Agriculture
FAA: Federal Aviation Administration
UR3: Urban Residential 3 per acre Zone

UGA: Urban Growth Area
AO: Airport Operations
LII: Light Impact Industrial
URM: Urban Residential Moderate Density Zone
ILS: Instrumental Landing System

CHAPTER 1. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

1.1 INTRODUCTION

Chapter 2 explains the proposed action, the alternative action, and the no action alternative for the Bellingham International Airport Expansion Project. The proposed action is the original action that the Port of Bellingham created for the expansion project. The alternative action was created after the original action was proposed to help in reducing environmental impacts. The no action alternative would be to not do anything. No action would mean to leave the airport as it is and to not take any further steps to achieve the proposed action's objectives. The location of all three actions is at the Bellingham International Airport and neighboring Port owned property within the City of Bellingham's limits east of Wynn Road, south of Slater Road, and West of Interstate 5 (I-5) (see Figure 3).

1.2 PROPOSED ACTION

1.2.1 PROJECT OBJECTIVES

The project objective is to create additional development areas within and adjacent to the Bellingham International Airport for airport-related, airport-dependent, light-industrial and commercial uses compatible with airport operations. Other objectives include:

- Obtain permits to directly fill 8.63 acres and indirectly fill 0.29 acres of on-site wetlands and provide 36.39 acres of off-site wetland mitigation.
- Resolve conflicts between the Whatcom County code and FAA requirements for landscaping, signage and parking.
- Adopt the Bellingham International Airport Storm water Management Master Plan prepared by DEA, Inc.
- Establish predictable standards and project timing allowing the creation of approximately 11 to 28 new specific sites for phased BSP/PUD development over a 20 year period.

1.2.2 PROJECT PROPOSAL

The Bellingham International Airport is divided up into eight Planning Areas, six of which have proposed changes under his plan. Figure 04 shows these planning areas and Figure 03 show how these will be phased over time. Phase one is from 2010 to 2020, phase two is from 2020 to 2030 and phase three is beyond the 20 year planning horizon of this project.

Commercial Aviation Planning Area

- This area contains the Main Terminal, the FAA control Tower, the International Arrivals Building and the main terminal parking area. Under the proposed action, the terminal building will be expanded an additional 55,000 square feet.

General Aviation Planning Area

- This area is currently used for aprons, taxi-ways, hangars and tie-downs, and fixed based operations such as fuel services. There are 315,000 square feet of building space proposed and all of it in this planning area will be used for aircraft hangars and tie-downs.

Airport Related Use Planning Area

- This area currently only contains 12,591 square feet of existing buildings. Proposed additional building of 50,000 square feet will consist of rental car agencies, lodging, and other airport relates services. There will also be a new 14.4 acre parking lot in this area.

Air Cargo Planning Area

- This is currently used for air cargo and small package freight operations with direct access to the runway. There are 30,000 square feet of additional building proposed, and this will also be for air-freight facilities.

Airport Operations Planning Area

- This area contains the runway, approach zones, taxi-ways, and aprons. There are no additional buildings proposed for this area, however the 6700 by 150 foot runway will be repaved and the adjacent 6700 foot long taxi-way will be repaved and widened from the existing 60 feet to 75 feet.

The **Aeronautical Land Use Area/ Reserve Tract** and the **Open Space Areas** have no proposed expansions included in this project proposal and are in phase three. Phase three is not included in the 20 year planning period of this project, and any future development plans in this area would need additional approval (Port of Bellingham, 2010).

Bellingham International Airport Land Use Map

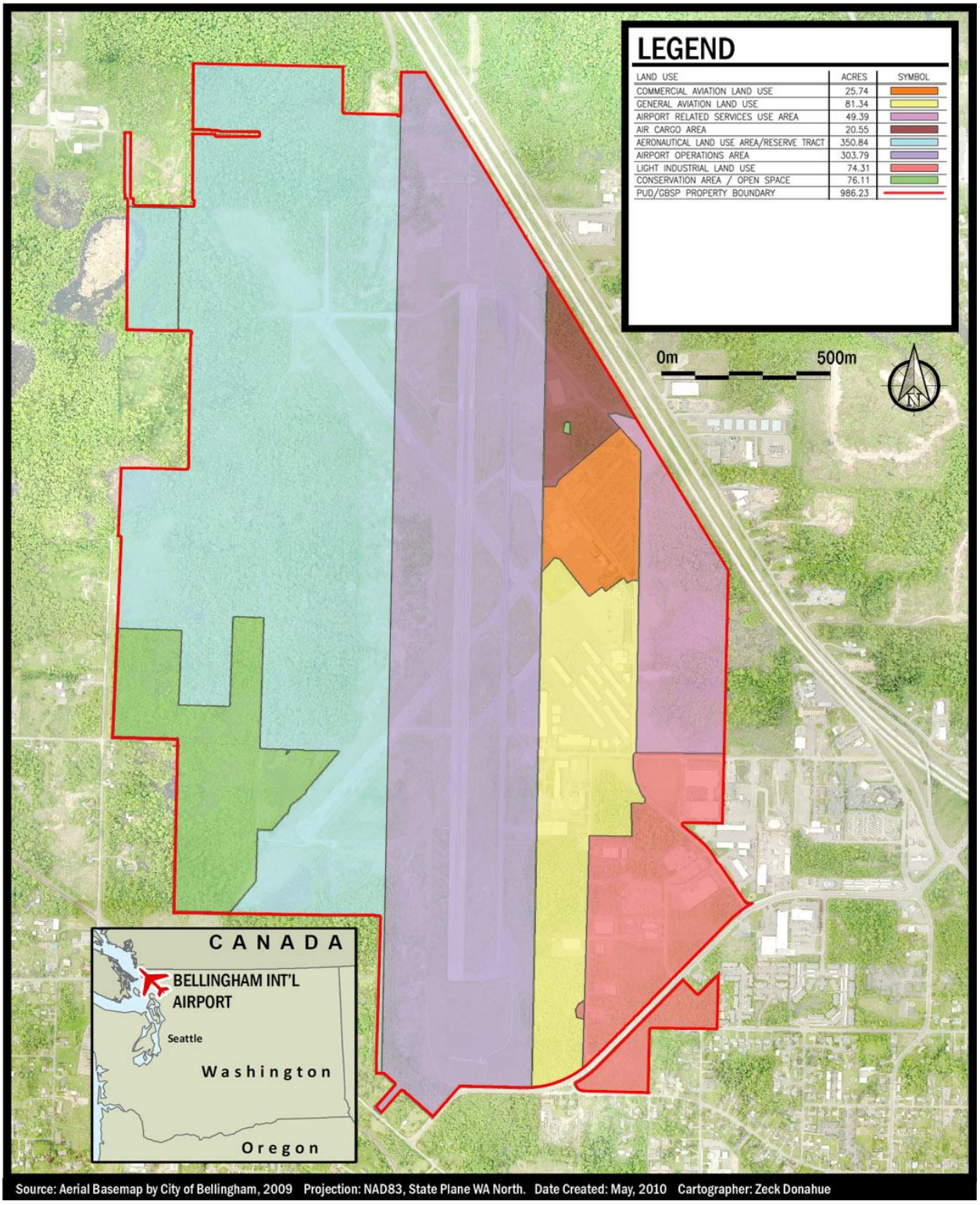

Figure 04- Map displaying the designated land uses at the Bellingham International Airport.

1.3 ALTERNATIVE ACTION

The alternative action achieves the proposed action's objectives, but with less environmental costs and degradation. By using mitigation measures that are not currently enforced by law, a lower environmental impact can be achieved. Specifically, greenhouse gas emissions can be fully or partially mitigated by purchasing greenhouse gas offsets and impacts on soil and water can be reduced by using Low Impact Development (LID) methods.

Buying Greenhouse Gas Offsets

In this alternative, the Port of Bellingham would be required to alleviate the pressure on Global Climate Change by mitigating for a portion of the greenhouse gas emissions that will result from the project. Whatcom County has set an emissions reduction target of 33% of projected emissions in 2020. This plan is described in detail in the Whatcom County Action Plan for Climate Protection. In order to be consistent with this goal, the Port of Bellingham would be required to offset at least 33% of their projected emissions. The project's total emissions have been estimated at 906,443.29 tons of carbon dioxide equivalent using the King County Department of Development and Environmental Service's SEPA GHG Emission Worksheet and recommended aircraft emissions modeling techniques. In order to comply, the Port of Bellingham would purchase greenhouse gas offsets for 299,126.29 tons of carbon dioxide equivalent over the 20 year life of this project.

Low Impact Development (LID)

Incorporating LID strategies into the expansion of the BLI project will help lessen harmful environmental impacts on soil erosion, storm water runoff, and pollution runoff. Where it is applicable, pervious surfaces, such as porous cement, should be implemented. Light Impact Industrial building sites, hangar building sites, parking lots, and sidewalks can implement porous cement without compromising the rest of the airport expansion project. The porous cement will decrease the projected amount of impervious surfaces of 3,344,234 square feet. This will in turn decrease storm water runoff and therefore pollutants into the drainage basins. Rain barrels can also be installed to catch excess water runoff from ceilings and other impervious surfaces and be recycled for any other airport water based needs. These practices have been found to be very affective and actually reduce the cost of projects in the end.

1.4 NO ACTION

Under the No Action Alternative, the Bellingham International Airport would not build or expand upon the airport operations, facilities, or nearby Light Impact Industrial Zone. The existing terminal at the airport is crowded currently, but not so much that it is a major problem. Future projections say that there could be an increase in passengers, but that would also depend on if the expansion project was completed. In leaving the airport alone, the airport will not grow and environmental conditions will stay as they are.

1.5 DECISION MATRIX

Decision Matrix		
	Proposed Action	**No Action**
Natural Environment		
Earth		
Soils	-	**0**
Air		
Climate	-	**0**
Air Quality	**0**	**0**
Water		
Surface Water Movement/Storm water Runoff	**0**	**0**
Wetlands	-	**0**
Vegetation and Wildlife		
Vegetation	-	**0**
Wildlife	-	**0**
Built Environment		
Environmental Health		
Environmental Health Hazards	-	**0**
Emergency Services	-	**0**
Noise	-	**0**
Transportation	-	**0**
Land Use	**0**	**0**
Energy and Natural Resources	**0**	**0**
Housing	**0**	**0**
Recreation	**0**	**0**
Historic and Cultural Preservation	**0**	**0**
Public Services	**0**	**0**
Aesthetics	**0**	**0**
Light and Glare	**0**	**0**
No Impact: 0	**Positive and Negative Impacts: + / -**	
Large Positive Impact: + +	**Positive Impact: +**	
Large Negative Impact: - -	**Negative Impact: -**	

CHAPTER 2. AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES AND MITIGATIONS

2.1 EARTH

2.1.1 SOILS

Existing Conditions

Four soil series have been detected by the Web Soil Survey for the Bellingham International Airport (BLI) area; Urban land-Whatcom Labounty complex(#172), Whatcom silt loam (#178), Whatcom silt loam (#179), and Whatcom Labounty silt loams (#182). The Urban land soil has between 0 and 8% slopes, is the most abundant soil in the area of interest and is found along the main airport facilities such as beneath and around the runway, terminal, and parking lots of the BLI. This soils drainage is moderate, has a very high water capacity, and does not frequently pond. The Whatcom silt loam #178 has between 0 and 3% slopes and is found on the western boundaries of the airport. It is moderately well drained, does not frequently pond, and is found within a non-developed forested area. The Whatcom silt loam # 179 has between 3 and 8% slopes which affect changes from the Whatcom silt loam #178. It is found west of the runway in a forested area. The drainage is moderate and there is no known ponding of water for this soil. The Whatcom-Labounty silt loam #182 has between 0 and 8% slopes and is found North, South, and Southwest of the runway and airport facilities in undeveloped areas. It is also moderately well drained and does not have any known ponding on the surface (Web Soil Survey).

Vegetation in the Whatcom silt loam soils and the Whatcom Labounty silt help slow runoff and increase organic matter. This creates a natural buffer between pollution from the BLI and the drainage basins, underground water, and creeks of the area since the airport is located on the highest point than the surrounding outlying areas. There are existing detention ponds to also help catch polluted runoff and have so far been able to keep most of the chemicals and other pollution out of the drainage basins and other water sources.

Erosion of the existing soils is low because of the natural vegetation, the infrequent heavy intense rainfall, and the drainage is moderately good for the 35 to 50 inches of rain Whatcom County receives annually. Since erosion is low, the soils have been able to develop naturally and vegetation has been stable in the area to establish natural buffers from the airport.

Proposed Action Impact

Approximately 26.8% of the proposed construction area will be covered with impervious surfaces (3,344,234 square feet). This will lead to larger amounts of water runoff with more chemicals and pollutants from the construction site which will lead to higher erosion rates which will lead to less soil development which will lead to less vegetation cover. With that environmental domino effect, the pollution runoff will be at hazardous levels and the soil

erosion that will occur will leave the land barren. Mitigation measures need to be put into place to stop this environmental degradation.

Proposed Action Mitigation Measures

There has been no set plan to use to minimize soil erosion and storm water runoff except to use existing plans that are mandatory. This may include the Storm water Pollution Prevention Plan, the Best Management Practices (BMP's), and a Temporary Erosion Sedimentation Control (TESC) plan. The TESC and BMPs plans are said to be implemented throughout the construction of the project and will use silt fencing, mulch netting, straw bale barriers, and check dams. If these measures are put in place then these mitigation measures will have lessened the environmental impacts of the proposed action so that there will be no significant impacts to pollution runoff and soil erosion. However, if they are for some reason not enforced and therefore not implemented the soil erosion and storm water runoff will be significant and will affect not only the land around the airport, but the pollution into the drainage basins and underground water sources.

Alternative Action Impact

The alternative action that has been proposed would use low impact development as well as fewer building sites to lessen the impact of runoff and soil erosion. Low impact development would use pervious cement where applicable, around hangers and other proposed building sites, as well as parking lots and sidewalks to lessen the runoff from impervious surfaces. Also, if fewer buildings were constructed the square footage of impervious surfaces will decrease and cause less runoff and erosion. The mitigation measures from the proposed action will still need to be use, but there will be no significant impact under this alternative.

No Action Impact

If this project is not done, there would be no significant impacts to the soil. The existing detention ponds and natural buffers keep most of the runoff pollution out of the drainages and water resources of the surrounding outlying area.

Bellingham International Airport Soil Sample Survey Map

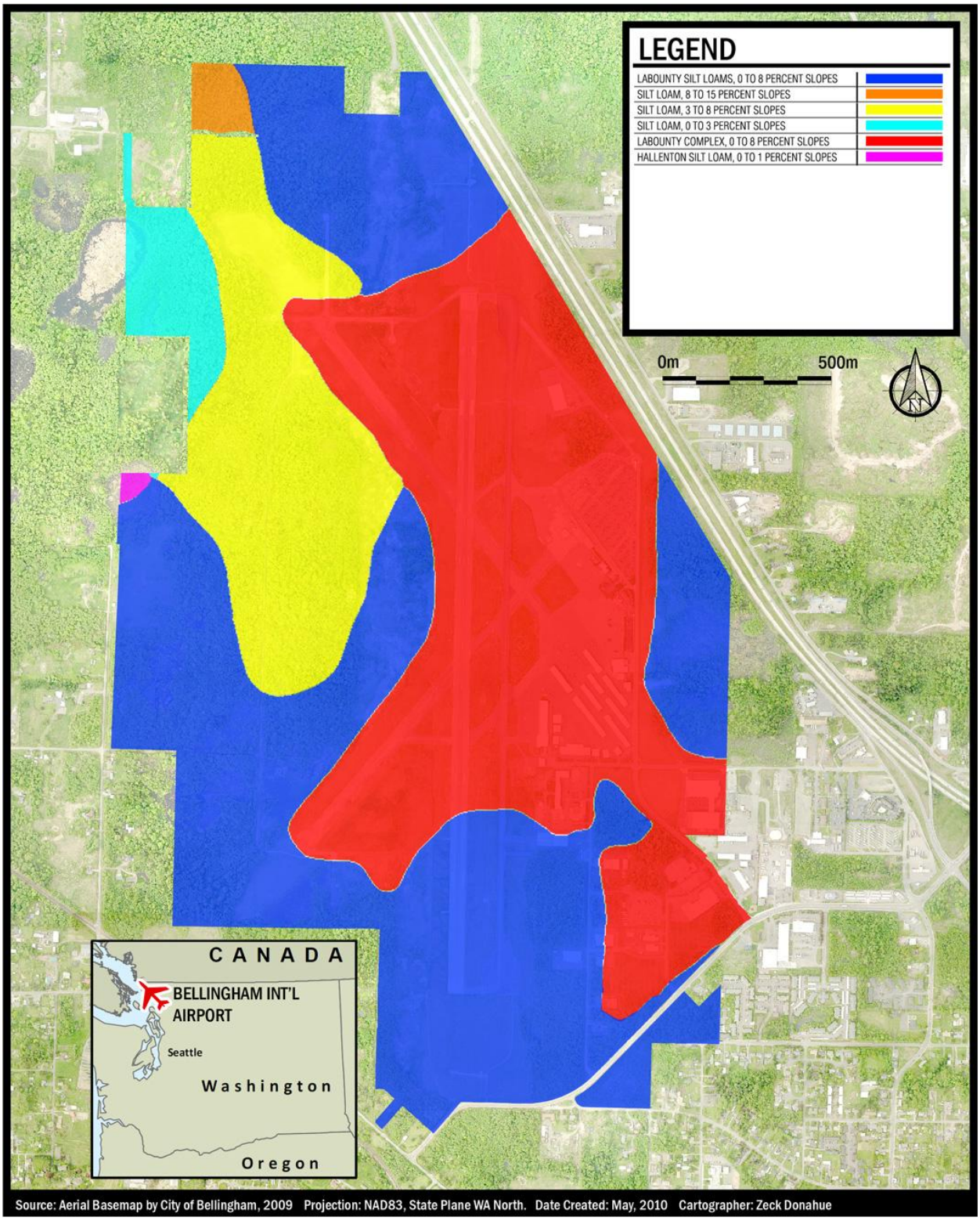

Figure 05- Map showing the different soil compositions and slope at the Bellingham International Airport.

2.2 AIR

2.2.1 CLIMATE

Existing Conditions

Whatcom County has a maritime climate where the influence of the ocean serves to maintain moderate temperatures. The mean annual temperature is 48.9˚F (9.4˚C) with a range of -4˚F (20˚C) to 97˚F (36˚C). The coldest months are December and January but most winters see minimal snowfall of approximately three inches per month. Winters are typically rainy. Average annual precipitation is 34 inches (86.4cm) with a range of 20 inches (50.8cm) to 49 inches (124.5cm) (COB "UGA" 2004).

Climate is an important consideration, not only for the impacts it may have on pollutants in the air, but also for the impact of human activity on the climate. Greenhouse gases (GHSs) such as water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (NO2), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride are gases that trap radiation and warm the planet's surface (EIA, 2010). Too many of these gases may overly heat the atmosphere, in effect, changing the climate. Whatcom County has proposed an Action Plan for Climate Protection in order to confront the issue and deal with the possible impacts. In 2001, Whatcom County totaled 2,750,728 tons of greenhouse gas emissions and this number is expected to rise to 3,650,660 by the year 2020. An emissions reduction target was set for 1,175,005 tons. This is 10% of the emissions in the baseline year of 2001, and 33% of total projected emissions (Whatcom County, 2007).

Proposed Action Impact

In addition to dust and exhaust from construction, this project will result in a significant increase in greenhouse gas emissions.

Based on information provided in the Binding Site Plan and through the use of the King County Department of Development and Environmental Service's SEPA GHG Emissions Worksheet, the greenhouse gasses that will result from the Airport Expansion project have been estimated (See table below). A total of 815,443 tons of CO2 equivalent emissions will result from the construction of, the energy demands of, and the transportation demands of this project over the life of the buildings and pavement. Of this, 527,369 tons will occur as a result of the phase one development, and 288,074 tons will be from phase two. This difference exists because the bulk of the development is concentrated in phase one and all of the paving of the runway, taxiway, and parking lot will occur in phase one as well.

Table 1 is the SEPA GHG Emissions Worksheet with the values for the Bellingham International Airport Expansion project. The binding site plan describes the planned use for each planning

area and each development area and these are categorized to fit the descriptions of the building uses set up by the GHG worksheet. The 'warehouse and storage' category includes development areas 5, 9, 10, and 14 from the General Aviation planning area which are going to be used as hangars. The 'other' category includes industrial areas with some retail space and all other miscellaneous buildings. Development areas 7, 8, 15, 16, 17, and 18 from the Light Industrial planning area and development area 1 in the Air Cargo planning area which will be used for air-freight operations are placed in this category. Development area 4 is in the Airport Related Services area and is predicted to be used for rental car agencies, overnight lodging, and other airport related services. Since the exact proportions of this are not known, the 50,000SF of this building area is divided equally into four separate categories: service, lodging, office, and retail. Also included in the retail category is the entire 55,000SF proposed addition to the terminal building. This could be included in several different categories including food service, office, and service but without any knowledge about what the additional space will be used for, placing it in the retail category will give a lower bound on the estimated emissions. The last section is pavement, and in this includes the entire repaving of the 6700 by 150 foot runway, the widening and repaving of a 6700 by 75 foot taxiway, and the 627,264SF (14.4 acre) parking lot that will be in development area 4.

In addition to greenhouse gases generated from the construction and use of the new buildings and the new pavement, there will be emissions from aircraft that result from the increased capacity of the terminal building and runway. The airport will be able to accommodate for group IV aircraft (Port of Bellingham, 2010), such as a Boeing 757 and the terminal will be able to handle 45,000 passengers a month, up from the average 30,000 it currently handles (Johnson, 2010). This increase in passenger volume will result in more flights and therefore more emissions. The recommended way for predicting emissions from non-stationary sources, such as planes, is by multiplying the gallons of fuel used by the emission coefficients put out by the Energy Information Administration (NY State Dept., 2009).

A Boeing 757 uses approximately 600 gallons of fuel during a typical flight 500 miles in distance (Winther and Rypdal, 2009) and jet fuel emits 18.355 pounds of CO_2 per gallon (US Energy Information Administration, 2010). This is approximately 5 tons of CO_2 per flight. If all of the 15,000 per month increase in passengers is met by Boeing 757s, which can hold 200 passengers each, then that will be an additional 75 flights and 380 tons of CO_2 per month. This amounts to 4,550 tons of CO_2 per year, and over the 20 year planning horizon it could reach 91,000 tons. Now this is just an estimate but it provides a general idea for what the possible emissions impacts could be. As it turns out, doing this same calculation with a Boeing 737 gave a result of 90,000 tons over that same period, so it is not dramatically different with a smaller plane.

Overall, this project would result in 906,443.29 tons of greenhouse gas emissions from buildings, transportation, energy and flights.

Table 1 Greenhouse Gas Emissions From Buildings and Pavement

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			**Lifespan Emissions (MTCO2e)**
			Embodied	Energy	Transportation	
Single-Family Home	0		98	672	792	-
Multi-Family Unit in Large Building	0		33	357	766	-
Multi-Family Unit in Small Building	0		54	681	766	-
Mobile Home	0		41	475	709	-
Education		0.0	39	646	361	-
Food Sales		0.0	39	1,541	282	-
Food Service		0.0	39	1,994	561	-
Health Care Inpatient		0.0	39	1,938	582	-
Health Care Outpatient		0.0	39	737	571	-
Lodging		12.5	39	777	117	**11,664.11**
Retail (Other Than Mall)		67.5	39	577	247	**58,236.01**
Office		12.5	39	723	588	**16,866.82**
Public Assembly		0.0	39	733	150	-
Public Order and Safety		0.0	39	899	374	-
Religious Worship		0.0	39	339	129	-
Service		12.5	39	599	266	**11,300.85**
Warehouse and Storage		315.0	39	352	181	**180,100.35**
Other		273.5	39	1,278	257	**430,536.95**
Vacant		0.0	39	162	47	-
Pavement		2,134.76				**106,738.20**
		Total Project Emissions:				**815,443.29**

Alternative Action Impact

Under an alternative, there would be actions taken to reduce greenhouse gas emissions. To keep future development consistent with the Whatcom County Action Plan for Climate Protection, the Port of Bellingham would reduce their carbon emissions by at least 33% through purchasing greenhouse gas offsets corresponding to the development that is occurring. Over the 20 year life of this project that would amount to a total of 299,126.29 tons of greenhouse gas emissions offsets. This would reduce the impacts that this development would contribute to global climate change.

Proposed Action Mitigation Measures

There are currently no laws or regulations in place that mandate control of greenhouse gas emissions. However, on December 7, 2009 the EPA Administrator made an endangerment finding specifying that greenhouse gases in the atmosphere present a threat to public health and welfare. This finding is specifically related to emissions from motor vehicles and marks the beginning of a process to finalize new standards. This recent development places no requirement on this project, but it does show the possibility of new requirements in the future to control greenhouse gas emissions and should be known (EPA, 2009).

No Action Impact

Under the no action alternative, there would be no significant increase in greenhouse gases from the construction and use of new buildings, or from new pavement at the Airport site. However, since greenhouse gases are evenly dispersed in the atmosphere it is reasonable to consider other sites. The Whatcom County Comprehensive Plan and Bellingham Urban Fringe plan predict a shortage of “serviced light industrial land” in Bellingham and Whatcom County (Preliminary Binding Site Plan, 2010). It is probable that the impacts of some of these buildings, especially the light industrial uses, will still occur with or without this specific development plan. In addition, there has been significant demand growth for flights from the Bellingham International Airport and this increase, over time, will still result in further greenhouse gas emissions from aircraft use (Gallagher, 2010).

2.2.1 AIR QUALITY

Existing Conditions

The Bellingham International Airport lies in the Fraser Valley airshed (COB “UGA” 2004). The Northwest Clean Air Agency (NWCAA) is in charge of enforcing federal, state, and local air pollution regulations in Island, Skagit and Whatcom counties. According to NWCAA’s air quality monitors in Anacortes, Bellingham, Lynden, Mount Vernon, and Oak Harbor, all areas are in compliance with the National Ambient Air Quality Standards (NAAQS) and the Washington State standards (NWCAA, 2010).

The NAAQS exist for six criteria pollutants including carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter (PM) 10, PM2.5, ozone (O3), and sulfur oxides and are regulated by the EPA (NWCAA, 2010). The Bellingham air quality monitor is located along Yew Street and it measures ozone and PM 2.5 levels. It currently reads 2.3ug/m3 in PM 2.5 and 0.03ppm in ozone (WA DOE, 2010). There is also an air quality monitor in Lynden. This monitor currently reads 3.5ug/m3 for PM2.5, 15ug/m3 for PM10, 0.036ppm for O3, 0.001ppm of NO2 and 0.149ppm of CO (WA DOE, 2010). All of these measurements are within acceptable limits of the NAAQS and the Washington State Standards (see table below). A carbon monoxide station operated between 1988 and 1990 and it too showed levels within the NAAQS (COB "UGA" 2004).

Table 2 National And State Ambient Air Quality Standards

The EPA has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants and are listed below. Units of measure for the standards are parts per million (ppm) by volume and micrograms per cubic meter of air (µg/m3).

POLLUTANT	NATIONAL PRIMARY STANDARDS	NATIONAL SECONDARY STANDARDS	WASHINGTON STATE STANDARDS
Carbon Monoxide (CO)			
8-hour	9 ppm	9 ppm	9 ppm
1-hour	35 ppm	35 ppm	
Lead			
Quarterly Average	1.5 µg/m3	1.5 µg/m3	1.5 µg/m3
Nitrogen Dioxide (NO2)			
Annual Mean	0.053 ppm	0.053 ppm	0.050 ppm
Particulate Matter (PM10)			
Annual Average	50 µg/m3	50 µg/m3	50 µg/m3
24-hour	150 ug/m3	150 ug/m3	150 ug/m3
Particulate Matter (PM2.5)			
Annual Average	15.0 µg/m3	15.0 µg/m3	15.0 µg/m3
24-hour	65 ug/m3	65 ug/m3	65 ug/m3
Ozone			
8-hours *	0.075 ppm	0.075 ppm	0.08 ppm
1-hour	0.12 ppm	0.12 ppm	0.12 ppm
Sulfur Oxides			
Annual Average	0.03 ppm	None	0.02 ppm **
24-hour 1	0.14 ppm	None	0.10 ppm
3-hourr 1	None	0.50 ppm	0.40 ppm
1-hour	None	None	0.80 ppm ***
5-minute	None	None	

* Eight hour ozone standard went into effect on September 16, 1997, but implementation is limited.

** 0.25 not to be exceeded more than two times in any 7 consecutive days.

*** NWCAA standard
Source: Northwest Clean Air Agency

Proposed Action Impact

There will be dust and exhaust as a result of the construction. However, this represents an insignificant impact, because as stated in the environmental checklist, standard equipment will be used and reasonable precautions taken to reduce these impacts (Environmental Checklist, 2009).

Alternative Action Impact

Under the alternative action, there would still be dust and exhaust as a result of the construction and growth in airport traffic.

No Action Impact

With no action, there will be no impacts from construction; however, continued growth in demand for flights out of the Bellingham International Airport will mean that there will still be increased exhaust emissions as a result of airplane traffic.

2.3 WATER

2.3.1 SURFACE WATER MOVEMENT / STORMWATER RUNOFF

Existing Conditions

BLI is located between a watershed divide. The North Bellingham Bay Watershed drains west to Bellingham Bay via Airport Creek. The Silver Creek Watershed drains northeast to Silver Creek, which is a tributary of the Nooksack River.

Within these two watersheds there are 10 sub basins. Sub basins that are located in the North Bellingham Bay Watershed include Airport Basin, Boxwood basin, West Marine Dr. Basin, East Marine Dr. Basin and Cliffside Basin. Water moves through Airport Creek as well as other small, unnamed streams. Sub basins that are located in the Silver Creek Watershed include Terminal Basin, Bakerview Basin, East Basin and North Basin. (David Evans & Associates, 1998).

There are two storm water detention facilities used to detain and filter runoff. The Southwest Detention Facility receives runoff from Airport Basin (Southwest) Basin and the west portion of Bakerview (East) Basin. The Alderwood Detention Facility receives runoff from Boxwood (Alderwood) Basin and Cliffside (South) Basin. Storm water runoff is channeled into these detention facilities through the use of roadside ditches and underground pipe systems. There is

also a detention vault and rain gardens that are used to detain parking lot storm water. (BLI Comprehensive Wetland Strategy, 2008).

Runoff from all other sub basins that were not mention above is not currently detained, retained or treated by any facilities. (BLI Comprehensive Wetland Strategy, 2008). Storm water runoff for the four sub basins (Terminal, Airport, Bakerview and Boxwood Basins) that will be affected by the Proposed Action are described below. The location of these sub basins are illustrated by the Bellingham International Airport Drainage Basin Map (see Figure 6).

Terminal (Runway NE) Basin

This basin consists of developed airport infrastructure, runways and taxiways. The terminal building, other small buildings and parking lots are all located in this basin. There is an existing storm water pipe system built underground that discharge into a forested wetland on the east side of the basin. A stream from the wetland crosses under Interstate 5 via a 24-inch culvert and drains into a tributary of Silver Creek.

Airport (Southwest) Basin

The majority of developed airport area is located in Airport Basin. Infrastructure, runways, taxiways, parking and roads are all located in this basin. There is also a portion of the Airport Basin that is forested, grassy and undeveloped.

There is an existing storm water culvert system that was built before 1975 in the developed areas of Airport Basin. Runoff is directed through 24 and 36-inch culverts to the Southwest Detention Facility. Remaining surface water flows towards the pond, which is located at the lowest point of the basin. Water from the Southwest Detention Facility discharges into Airport Creek, which drains to Bellingham bay.

Bakerview (East) Basin

Bakerview Basin existing conditions consist of undeveloped forest, no current storm water infrastructure exits. Water from Bakerview Basin drains through two 12-inch culverts under I-5 and into a tributary of Silver Creek.

Boxwood (Alderwood) Basin

Current existing conditions in Boxwood Basin consists of light industrial areas and County roads. There are some areas of this basin that are not developed, these areas are either forested or abandoned, previously developed areas. Storm water runoff is diverted through ditches along Sound Way, Williamson Way and Airport Drive. Water is discharged through an 18-inch culvert into a stream that drains into an existing Alderwood Detention Facility. Water from Alderwood Detention Facility is drained into an unnamed stream that flows into Bellingham Bay.

Alternative Action Impact

Future development of BLI will use the existing Southwest and Alderwood Detention Facilities to detain and treat storm water. The sub basins that will be affected by the Proposed Action

that do not drain into the existing detention facilities include Terminal Basin and a portion of Bakerview Basin.

Additional detention facilities will be built and designed in accordance with the Washington State Department of Ecology (WSDOE) Manual. These detention facilities will provide storm water detention and treatment for the remaining development areas that do not already drain into existing detention facilities. Water quality treatment will be designed according to FFA guidelines and avoid creation of open water and habitat that attracts waterfowl. (BLI Comprehensive Wetland Strategy, 2008).

Before the BLI development construction begins a Storm Water Pollution Prevention Plan (SWPPP) will be prepared according to Whatcom County standards. This plan will be based on Best Management Practices (BPMs) and will address both short and long term storm water and erosion control. The SWPPP will be implemented as a program for specific site development areas. (BLI Comprehensive Wetland Strategy, 2008).

Proposed Action Mitigation Measures

Mitigation measures are included in the Proposed Action. Mitigation includes creation of additional detention facilities and the development of the Storm Water Pollution Prevention Plan. These measures will be carried out in appliance to the Washington State Department of Ecology Manual and Whatcom County Standards.

Alternative Action

The use of Low Impact Development (LID) will significantly decrease the amount of storm water runoff generated by the Proposed Action. Porous cement will decrease the projected amount of impervious surfaces of 3,344,234 square feet. This will in turn decrease storm water runoff and therefore pollutants into the drainage basins. Rain barrels can also be installed to catch excess water runoff from ceilings and other impervious surfaces and be recycled for any other airport water based needs. These practices have been found to be very affective and actually reduce the cost of projects in the end.

No Action Alternative

The No Action Alternative will consist of a continuation of the current existing conditions. Storm water runoff will drain through existing wetlands, ditches and small, unnamed streams. The current storm water detention facilities will need to be maintained in order to effectively detain and treat runoff. Additional storm water detention facilities should be built in order to treat runoff from sub basins that do not drain into the existing detention facilities. Surface water movement will continue to drain through BLI sub basins into Bellingham Bay and tributaries of the Nooksack River.

Bellingham International Airport Wetlands Determination Watershed and Drainage Basin Map

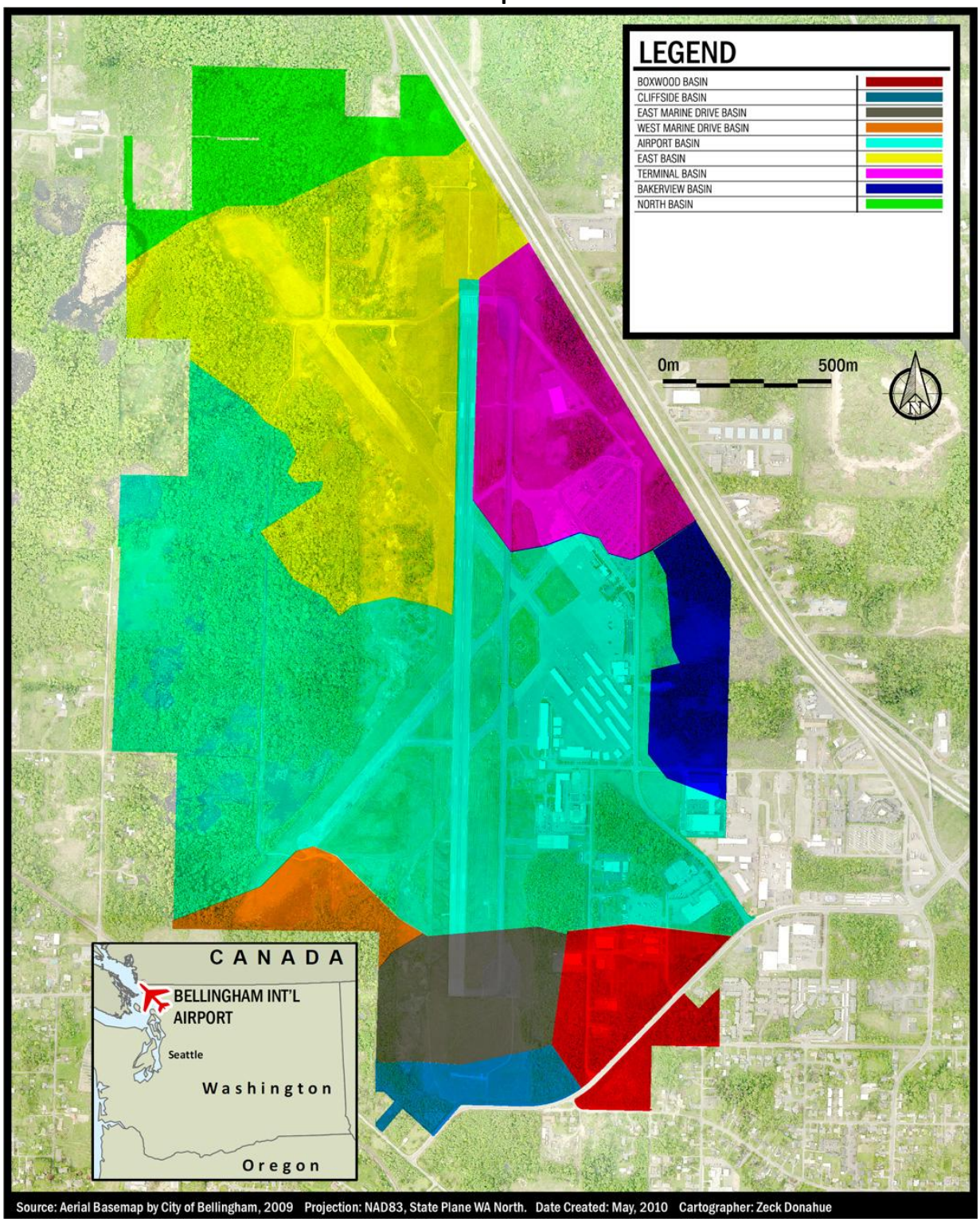

Figure 06- Map distinguishing the different drainage basins present at the Bellingham International Airport.

2.3.2 WETLANDS

Existing Conditions

Wetlands provide important water retention and filtration functions. They also provide habitat for many plant and animal species.

Wetland hydrology of BLI wetlands is directly influenced by precipitation and a seasonally high water table. Runoff from local impervious surfaces is also a source of wetland hydrology. David Evans & Associates found wetland soils to be saturated within 12 inches of the surface during most field studies. However, a portion of the wetland delineation was performed during summer months when wetland hydrology could not be directly observed. (David Evans & Associates, Inc. 1998)

David Evans & Associates, Inc. prepared the Wetland Analysis for Bellingham International Airport in 1998. Although this study was done in 1998 it is the most current representation of existing conditions. Current conditions have not changed significantly since this study was prepared. For this analysis BLI was divided into study areas A though P. The study areas that will be affected by the Proposed Action include Study Area B, C and J. These study areas and corresponding wetlands are described below.

The Bellingham International Airport Wetlands Map shows the exact location of all wetlands on site. Study area locations are illustrated by the Bellingham International Airport Study Area Wetlands Map (see Figure 8).

Study Area B

Study Area B consists of Airport industrial area. This 14-acre area contains impervious surfaces for buildings and parking. There already exists an unnatural, gravely fill in this area that perches water during wet months. A few of these wet spots were flagged, but further jurisdictional guidance is needed to determine the qualification of these as wetlands since they are occurring in an already disturbed location.

Eighteen wetlands comprising 5.6 acres were delineated by David Evans & Associates, Inc. On the north end natural drainage patters exist that are perched. To the south woodland areas and an abandoned wood sorting yard drain south through Boxwood Basin.

Study Area C

East woods between Mitchell Way (east) and an undeveloped woodland area privately owned by the Human Society (west). There are 11 separate wetlands in this area totaling about 14.75 acres. Most of this is thickly forested and undisturbed or of low disturbance. It is clearly defined with a central wetland formed in a depression. The area drains into an unnamed tributary to Bear Creek of the Silver Creek watershed through the Bakerview Basin. These wetlands are of high quality and provide excellent habitat areas.

Study Area J

Study Area J is about 13 acres and is located southeast of Runway 34. The area was heavily affected by logging and conditions reflect regenerating clear-cut logging. Logging roads in the area affect drainage and traverse wetlands. There are six wetlands totaling 4.59 acres. Industrial development isolates the wetlands. In winter months water perches and recedes when less rainy conditions occur.

Proposed Action Impact

The Proposed Action will result in the filling of 8.9 acres of wetland, including parts of 25 different wetlands (see Figure 7). There is a wetland buffer plan prepared by David Evans & Associates in order to protect unfilled wetlands during future airport development. A total of 606,080 square feet of the development area has been designated as wetland buffer area. (David Evans & Associates, 1998).

All fill material will be from an approved clean fill provider. The average depth of will be 3 feet and fill activity will be occur depending on development over the next 20 years. A total of approximately 43,000 cubic yards of fill material will be used. (Port of Bellingham, 2007).

Cook Scientific Services, Inc. has prepared a plan for wetland mitigation. This plan highlights the specific wetlands that will be filled and the locations of compensatory wetlands that will be built. The plan will mitigate for hydrology detention, recharge, and water quality functions on site and habitat functions off site. Off site mitigation will include the creation and enhancement of wetlands along the east bank of the Nooksack River off of Slater Road. This area is owned and managed by the Washington State Department of Fish and Wildlife. (Port of Bellingham, 2007).

On Site Mitigation

Buffers will be placed around all remaining wetlands that will not be filled. These buffers will provide protection from erosion and construction runoff during development, as well as habitat protection. On site wetland function will be mitigated by the use of storm water detention and treatment facilities. Two such facilities exist as the Alderwood and Southwest detention facilities. These facilities will be utilized as well as one or more new facilities that will be built.

Wetland functions that will be mitigated on site include water retention, filtration (water quality functions) and recharge. Underground pipe systems and ditches will drain water into treatment facilities that will provide appropriate wetland functions.

Off Site Mitigation

Off site mitigation will include wetland creation, wetland enhancement and upland enhancement. These compensatory wetlands and enhancement areas will be located along the east bank of the Nooksack River. This land is owned and managed by the Washington State Department of Fish and Wildlife.

A total of 35.78 acres of off-site compensation will be used to mitigate for wetland habitat functions. There will be 9.3 acres of new wetlands built, 9.49 acres of wetland enhancement and 16.99 acres of wetland rehabilitation. All wetland mitigation designs will be based on and follow the guidelines created by the Washington State Department of Ecology (WSDOE) (Port of Bellingham, 2008).

Proposed Action Mitigation Measures

Wetland mitigation is included in the BLI expansion proposal. Wetlands will be mitigated on site and off site. Mitigation measures are described above and are consistent with Washington State and Whatcom County regulation.

Alternative Action

The Alternative action will have no significant impact on wetlands. Mitigation measures will serve to replace all wetland functions on and off site.

No Action Alternative

No Proposed Action would result in wetlands remaining intact. Disturbed wetlands will continue to be degraded with time and continuation of current industrial uses. BLI will continue to increase the amount of use as far as its current capacity can withstand. This increase in Airport use will be detrimental to wetlands especially wetlands that are already highly disturbed. Wetland buffers must remain at current standards in order to preserve wetland functions.

Bellingham International Airport Basin

Figure 07- Photo of wetlands that will be filled in to create a parking lot.

Bellingham International Airport Wetlands Map

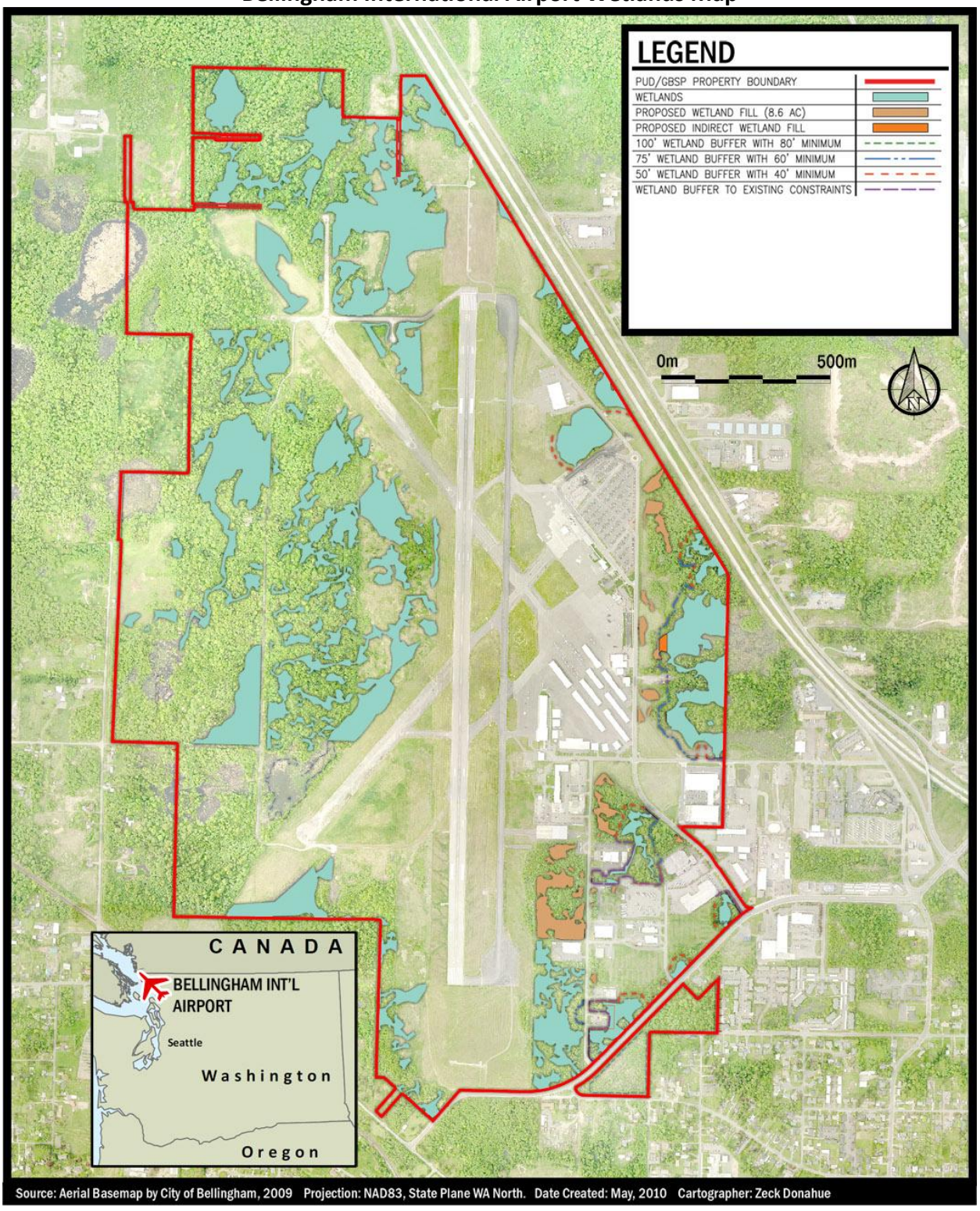

Figure 08- Map displaying the confirmed impacted wetlands present at the Bellingham International Airport by the expansion.

Bellingham International Airport Study Area Wetlands

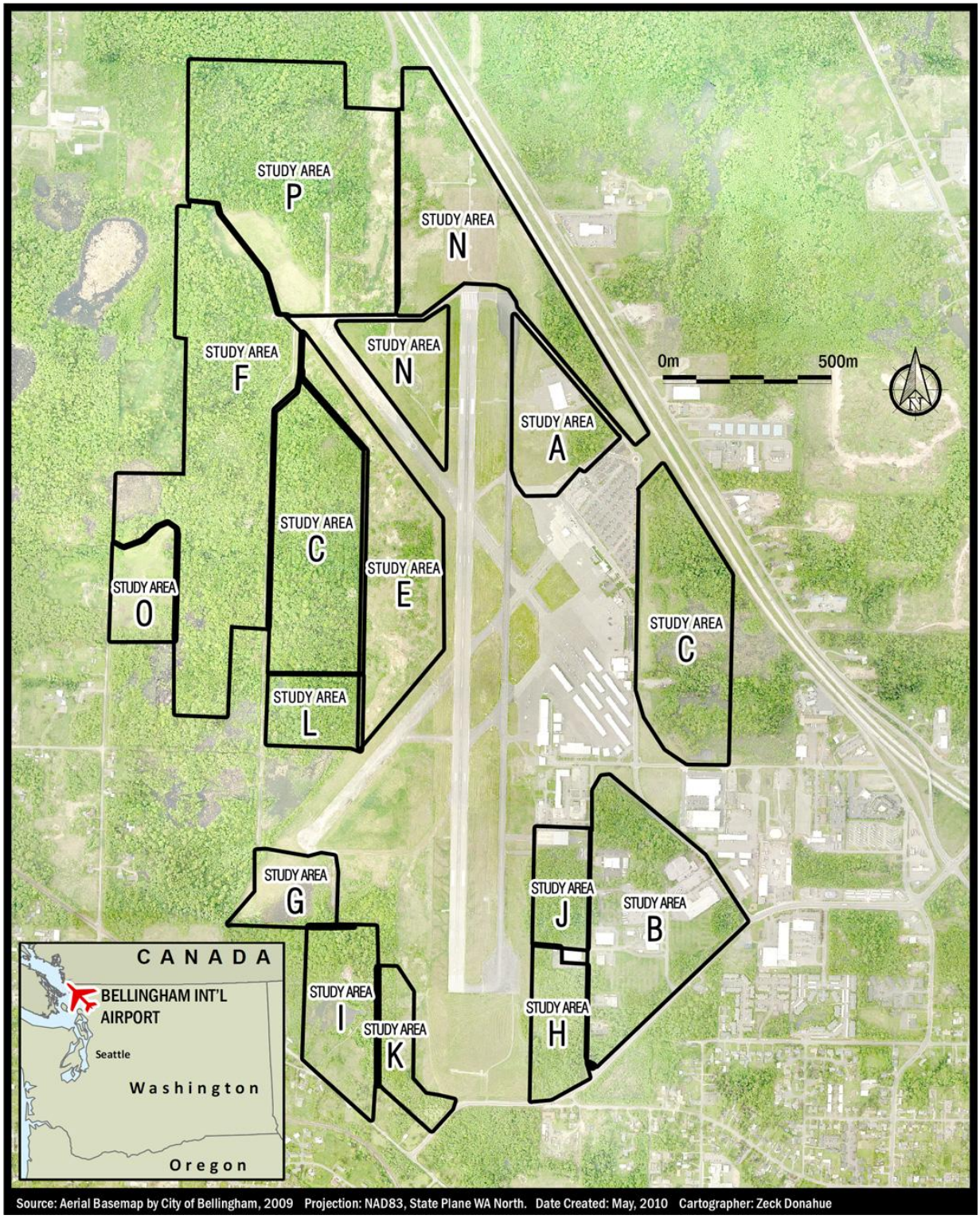

Figure 09- Map of the different study areas in trying to recognize the impacts to wetlands by development.

2.4 VEGETATION AND WILDLIFE

2.4.1 VEGETATION

Existing Conditions

David Evans & Associates evaluated BLI for vegetation qualities based on vegetation types. Habitat diversity is enhanced with a variety of interspersed vegetation types. The following vegetation types identified on site are described below.

Upland Forest
Forest is made up of red alder, paper birch, big-leaf maple, Douglas fir and bitter cherry. Western red cedar is rarer but was found on site. The under story is made up of vine maple, snowberry, ocean spray, Indian plum and thimbleberry. Other plants found on the forest floor are not abundant but include sword fern, Pacific bleeding heart and piggy-black pant. Western trillium and bracken fern are also found but only in areas where light shines though the canopy.

Wetland Forest
The canopy of the Wetland Forest areas is predominantly made up of red alder and black cottonwood with an occasional western red cedar. There were a few Sitka spruce found on the western side of the site. Pacific willow, Scouler's willow and Sitka willow are common among the Wetland Forests. The north end of Runway 16-34 has a few patches of quaking aspen stands. Shrubs found in these vegetation types include salmonberry, re-osier dogwood, Douglas spirea, black twinberry, red elderberry, spreading gooseberry and prickly current.

Forest Emergent
Emergent's present vary greatly depending on the amount and condition of surface water. Most of the wetland hydrology patterns support slough sedge, skunk cabbage, water parsley and American speedwell. Other plants found in Forest Emergent vegetations types include lady fern, spreading wood fern and Piggy-black plant. Tall manna grass and common cattail are also found in wet forest openings. More disturbed areas support creeping buttercup, soft rush and reed canary grass.

Wetland Meadow
The dominant vegetation in the Wetland Meadows is red fescue, creeping bent grass or tall fescue and soft rush. Other plants include meadow foxtail, water foxtail, slough sedge and small-fruited bulrush. Some areas are dominated by reed canary grass.

Proposed Action Impact

Development of the Proposed Action will occur in areas that are already heavily developed. Vegetation types that will be removed are primarily Wetland Meadow. These areas are located in the wetland areas that will be filled; a total of 8.9 acres of Wetland Meadow habitat will be destroyed.

The Wetland Mitigation Plan prepared by Cook Scientific Services, Inc. will replace vegetation types that will be destroyed by the Proposed Action off site. A buffer will protect vegetation types that are not destroyed on site.

Off site mitigation will include wetland creation, wetland enhancement and upland enhancement. These compensatory wetlands and enhancement areas will be located along the east bank of the Nooksack River. This land is owned and managed by the Washington State Department of Fish and Wildlife.

A total of 35.78 acres of off-site compensation will be used to mitigate for wetland habitat functions. There will be 9.3 acres of new wetlands built, 9.49 acres of wetland enhancement and 16.99 acres of wetland rehabilitation. All wetland mitigation designs will be based on and follow the guidelines created by the Washington State Department of Ecology (WSDOE) (Port of Bellingham, 2008).

Proposed Action Mitigation Measures

Vegetation will either be mitigated by off site replacement or protected on site by buffers. Mitigation will be included in the proposal.

Alternative Action

The Alternative proposed will not significantly impact the vegetation on site. Vegetation mitigation is included in the Proposed Action.

No Action Alternative

If the Proposed Action is not carried out all vegetation types will remain undisturbed. Current existing conditions will remain.

Figure 10- Photo showing the wetland vegetation found in study area J.

2.4.2 WILDLIFE

Existing Conditions

BLI is located within the Pacific Flyway migratory route. This is an important north to south migration path of waterfowl. Migratory waterfowl and songbirds, resident songbirds, shorebirds and raptors can be found on or near the site.

Mega fauna such as elk and deer inhabit the area. These animals rely on the undeveloped areas on site for habitat and food sources. Varieties of smaller animals also inhabit the area; these animals include beaver, foxes, raccoons, rodent species and other similar species.

BLI drains into Nooksack River and Bellingham Bay. Species potentially affected include resident game fish such as rainbow and bull trout, non game fish such as sculpin. Migratory species may also be affected such as salmon and steelhead. Some of these species are currently under review and may be listed under the Endangered Species Act.

Proposed Action Impact

The Proposed Action will eliminate a portion of habitat for resident and migratory species located on the site. Approximately 8.9 acres of habitat will be destroyed. All habitat function will be replaced off site.

Drainage from BLI will be detained and treated before it is released to Bellingham Bay and tributaries of the Nooksack River. This will protect fish and other aquatic species that live in Bellingham Bay and the Nooksack River.

Off site mitigation will include wetland creation, wetland enhancement and upland enhancement. These compensatory wetlands and enhancement areas will be located along the east bank of the Nooksack River. This land is owned and managed by the Washington State Department of Fish and Wildlife.

A total of 35.78 acres of off site compensation will be used to mitigate for wetland habitat functions. There will be 9.3 acres of new wetlands built, 9.49 acres of wetland enhancement and 16.99 acres of wetland rehabilitation. All wetland mitigation designs will be based on and follow the guidelines created by the Washington State Department of Ecology (WSDOE). (Port of Bellingham, 2008).

Increased air traffic will have an effect on migratory and resident birds. There will be an approximate increase of about 75 more flights per month with the expansion of BLI. It is unknown how this increase will directly affect bird species in the area.

Proposed Action Mitigation Measures

Wildlife Habitat mitigation will be included in the proposal. Wildlife habitat will be replaced off site and is described in the above section.

Alternative Action Impact

The Alternative Action will not significantly affect the wildlife. Wildlife habitat will be mitigated off site and is included in the proposal. Storm water that could affect fish and other aquatic species will be managed and treated on site and is also included in the proposal.

No Action Impact

No Action will result in all habitats on site remaining intact. Projected growth of BLI without continuation of the Proposed Action will result in some degradation of existing habitat.

CHAPTER 3. ELEMENTS OF THE BUILT ENVIRONMENT

3.1 NOISE

Existing Conditions

Noise is defined as unwanted, annoying, unexpected, or loud sound. The amount of noise that is being produced by the Bellingham Airport is an external impact of the daily operation of the airport. The existing sources of noise for the airport and its surrounding area come from traffic, daily operations, and equipment such as airplanes. In periods of construction it is necessary to consider the likely increase in noise level and frequency that will result from increased traffic, machinery, and new operations. The current and potential impacts of noise from the area can result in annoyance stress, high blood pressure, sleep loss, the inability to concentrate, the inability to learn and the loss of productivity.

Proposed Action Impact

For the proposed airport expansion there will be increase in noise level being produced and how often it is produced, depending on the phase. In the first phase when the runway is being repaved the surrounding neighborhoods can expect noise increase from the bulldozers and cement trucks laying the asphalt. The nearest residential area is located just outside of the airport property to the southeast. The predictions that have been made using noise contour maps predict that the level of noise growth of the noise will stay nearly the same over the 20 year expansion.

The larger terminal will increase the frequency in the airplanes taking off and landing. The most common size commercial airplane currently at BLI is the Boeing MD-80 (172 passengers). The expansion will allow the use of the large Boeing 757 (186-279 passengers). This gives a potential for 15,000 more passengers per month. The overall noise footprint will be decrease with the shift to the larger 757 sized airplane (See Fig 09). With these larger Boeing 757 airplanes the level of noise will be decreased, but at the same time more frequent. There have not been any projections made to forecast this increase in total flights in and out of BLI.

Dating back to the 1993 changes to the 150 Noise Compatibility Plan, the Port of Bellingham has been committed to being a caring member of the community and recognizing their potential noise impacts on the neighborhoods surrounding the airport (Port of Bellingham, 2009). Air traffic noise affects primarily the areas surrounding BLI and the areas under the takeoff and landing paths of the aircrafts. The fallowing noise mitigation efforts have been put in effect for BLI. The first is the VFR noise abatement procedures which give pilots specific directions on the path that they are to take off and land:

1. Departures - Runway 16: Fly runway heading to shoreline before commencing turns.

2. Arrivals - Runway 16: Follow published traffic pattern procedures.

3. Departures - Runway 34: Fly runway heading to freeway before commencing turns.

4. Arrivals - Runway 34: Fly base leg over water, fly final leg to cross shoreline on runway

Some factors that have affected pilots and may have caused higher than normal noise levels in the surrounding neighborhoods include, weather, emergency procedures, training requirements, or the direction of the tower signal.

Secondly, there are noise abatement procedures that are performed voluntarily by the members of the aviation community using the airport. Through the pilot education classes that are conducted at the airport they are instructed to take the most care for the noise that they may be producing.

The times that the most near or on ground noise is produced come when they are checking the engines functionality before their use. There are currently engine run-up restrictions stating that, “no person shall run the engine of an aircraft in any location of the airport in such manner as to cause damage or injury to aircraft, property, or persons or to create a nuisance to establishments of the airport” (Choat, 2010). This is to be done near the north end of the runway, further from the nearest neighborhood.

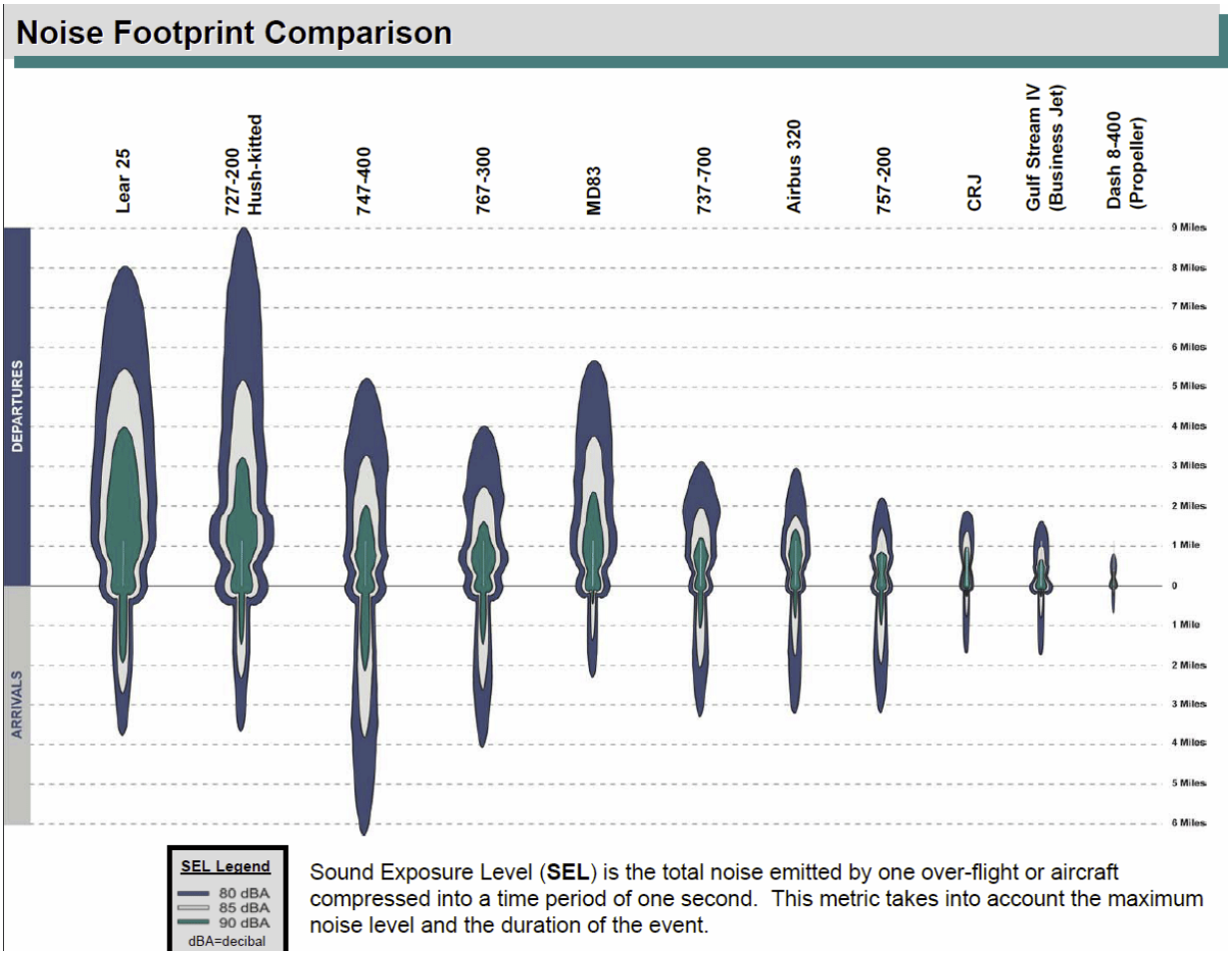

Figure 11- Comparison of noise levels from different aircraft on takeoff and landing.

Alternative Action Impact

It is uncertain to exactly what degree the level noise will be affected by the expansion. Over the 20 year expansion, there is predicted to be an overall decrease in the noise exposure relative to their operations. This will occur as the fleet of airplanes utilizing the Bellingham Airport shift to a newer, larger and quieter. Over the next 20 years there will be an increase in air passenger counts and the noise contour lines are projected to remain the same (Port Of Bellingham, 2009). Some mitigating measures to reducing the impact of sound could include: restricting construction to only day time hours, encourage the use of low noise equipment, monitor the flight path and times of the helicopter to St. Joseph hospital, encourage carpooling or alternate transportation to reduce traffic noise, encourage the use of quieter vehicles such as hybrids, develop a noise awareness program for the workers to fallow, and the use of noise reducing construction materials on buildings and roads (Luther, 2007).

No Action Impact

There is no projected increase in noise produced at the airport.

3.2 ENVIRONMENTAL HEALTH

3.2.1 ENVIRONMENTAL HEALTH HAZARDS

Existing Conditions

The Bellingham International Airport project site includes uses such as commercial and general aviation operations, fixed-based operations (providing fuel and other services), hangars and aircraft tie-downs, and industrial uses (Port of Bellingham, 2010). The airport requires on-site jet fuel refueling and other maintenance that requires toxic chemicals. The adjacent industrial uses also include the risk of possible toxic spills or accidents (Port of Bellingham, 2009).

Proposed Action Impact

This project requires 174,000 tons of asphalt to repave the existing 150 by 6700 foot runway and to expand the 60 foot wide taxiway to 75 feet (Port of Bellingham, 2010). The National Institute for Occupational Health and Safety (NIOSH) recommends exposure limits (Ca C 5mg/m^3) for asphalt workers (NIOSH, 2005). A literature review of the health effects of asphalt fumes suggests that any possible related health effects are a result of direct contact with asphalt through inhalation or absorbed through the skin. Epidemiological studies have mixed results. Some have shown statistical significance of a higher risk of asphalt workers to certain health effects, but other studies have not (NIOSH, 1997).

Other impacts from the airport expansion project consist of a continuation of existing trends in airport operation and the industrial and airport related uses. There is anticipated to be higher volume of passengers and with that comes more flights and more refueling. The projections by the Whatcom County Comprehensive Plan and the Bellingham Urban Fringe Plan that there will be a shortage of light industrial land suggests that the light industrial land in the project will indeed be put to use (Port of Bellingham, 2010). With that comes the possibility of more spills, fires, or accidents (Port of Bellingham, 2010).

Proposed Action Mitigation Measures

There are currently no Occupational Safety and Health Administration standards for asphalt fumes; however exposures to asphalt fumes are addressed under standards requiring personal protective equipment. Under section 5(a)(1) of the OSH Act the employer is required to "furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his

employees". By following these standards, asphalt workers will be protected from inhalation of or skin-contact with the asphalt.

Federal Aviation Administration Regulations in section 139.321 mandate that any airport holding a certificate must “establish and maintain standards authorized by the Administrator for protecting against fire and explosions in storing, dispensing, and otherwise handling fuel on the airport.” By following these regulations and standards, the Bellingham International Airport can minimize impacts caused by fuel use.

Alternative Action Impact

There will be the same impacts from asphalt paving under the alternative action.

No Action Impact

If there is no action at the Bellingham International Airport site, there would be no need for concern over asphalt fumes from the paving; however that raises the issue of the impacts of the activities that are currently taking place to maintain the runway. Impacts from increased use of the airport and the industrial land uses may still be applicable. Continued demand growth for the Bellingham airport will result in higher passenger traffic and more flights with or without this project. Also, the projected shortages in light industrial land show that these uses will be necessary in the future. Without this project, these uses may be placed someplace else, and the impacts would be the same.

3.2.2 EMERGENCY SERVICES

Existing Conditions

The airport is certified by the Federal Aviation Administration under Part 139 and is classified as an index B airport under section 139.315 (Port of Bellingham, 2009). These index classifications are determined based on the size of the aircraft and the average daily departures of those aircraft. Each index level requires a certain amount of firefighting and emergency medical services that must be pre-arranged and ready to respond when alerted (section 139.315 FAA Regulation).

Proposed Action Impact

The Bellingham International Airport expansion will increase the capacity of the airport and allow it to handle many more passengers (Johnson, 2010). Higher passenger traffic means that there would be a greater risk of accidents and more emergency services would be required. At the increased level of passenger traffic the airport will need to be reclassified as an index C airport (Port of Bellingham, 2009).

Proposed Action Mitigation Measures

Under Federal Aviation Administration Regulations in section 139.315 it states what is required under an index C classification. By following these mandated regulations, the Port of Bellingham will mitigate for any increased risks associated with this project.

Alternative Action Impact

Under the alternative action, the capacity of the airport will still be expanded therefore this reclassification to an index C airport will still be necessary.

No Action Impact

If this project is not done, the impacts may be just the same. Even though this project will allow for more capacity at the airport, estimates that demand for airport services will naturally increase may result in the need to reclassify BLI as an index C airport anyway.

3.3 TRANSPORTATION

Existing Conditions

There are 5 main arterials that serve the Bellingham Airport, Bakerview Road, Airport Drive, Williamson Way, Airport Way, and Mitchell Way. Traffic on these two lane roads is controlled by stop signs. The current use of these roads allow them to function with no times of congestion even during the peak traffic hours. At the current size of the Bellingham airport there is a shortage of over 500 parking spaces. In 2008 there were a total of 1652 parking spaces at BLI, and this includes the overflow lot that is accessible by shuttle. During peak times this was not enough parking and there were greater than 200 cars that were being parked on Mitchell Way and other streets or undeveloped grassy areas (Port of Bellingham, 2008). The majority of the BLI patrons are from outside the Bellingham are, many of which are Canadian who use the airport parking for extended parking, rather than being dropped off and picked up. The current public bus transportation that serves the airport area fails to go all the way to the terminal, leaving the closes stop a walking distance of one mile to the terminal from the stop on Airport Drive and Airport Way. From the airport this bus will take passengers toward the Lummi Ferry or to Downtown Bellingham bus station coming to the area approximately every 45 minutes (WTA Bus Schedule).

Table 3 Projected BLI Parking Demand

	2007	2025
Projected Annual Enplanements	310,791	363,180
Projected peak month enplanements	30,768	35,955
Average enplanements per week in peak month	7,692	8,989
1 space/ 3.9 passengers = parking demand/week	1,972	2,305
Rental car spaces	125	190
Employee parking	75	125
20% Contingency		524
Total parking spaces needed	2,172	3,144

Alternative Action Impact

There currently is a form of public transit, a city bus line, which serves the airport. It is important to note that this bus line fails to go all the way to the terminal. The nearest stop is just outside the road to the airport terminal. In an attempt to lessen the amount of traffic going to the airport, a bus line could be further developed to go from the downtown Bellingham or Cordata stations to the airport terminal. There could also be a parking lot that is created in a separate location with more available space and shuttle people to the airport. The frequency of the number of trips that the bus would me to the airport would be more frequent during the peak times of the day. There will be an increase in the demand for public transportation with the projected increase of employees parking rising from 75-125, the option of public transportation will be an alternative.

No Action Impact

Considering that 80% of the people using Bellingham Internationals Airport come from areas outside of Bellingham, there would be a major shortage in the amount of parking that is necessary to meet the growth in the amount of flights and passengers that are projected to be using the airport with the expansion.

3.4 LAND USE

Existing Conditions

Zoning for the existing project area is mainly for Airport Operations (AO) and Light Impact Industrial (LII) use. Other zoning areas within the Port owned lands are Urban Residential 3 units per acre (UR3), Rural Residential (RR1), and Urban Residential Medium Density (URM), but phase 1 and 2 of the proposed action are only within AO and LII. The main use of the land is for operating and facilitating the BLI in the AO zone and owning and operating light industry in the LLI zone. Residential areas are located on the outskirts of the Port land and for the most part, besides noise pollution, are not affected by the airport (EIA).

Currently there is approximately 1,078 acres just outside of the Bellingham City limits that is designated to the BLI and owned by the Port of Bellingham. BLI is a FAA Class 1 airport that has an all weather approach runway (6,700 x 150 feet), a full instrument Landing System (ILS), and an FAA Air Traffic Control Tower that supports both private and commercial flights. Around the airport there are 123 hangers and 69 aircraft tie-downs. On the outskirts of the airport is the Airport Industrial Park (AIP) that supports businesses. There are 14 tenants in the AIP that are both private and Port owned. There are also various parking lots near the airport terminal as well as overflow parking lots located in the LII Zone. There are no other uses for this land currently (SEPA Checklist).

Proposed Action Impact

There are no proposed changes to the land use zoning, however, the project area is located within the City of Bellingham's Urban Growth Area (UGA) and will be building upon land that has never been built upon before. Eighteen more buildings will be erected along with sidewalks, parking lots, and roads. Also the runway will expand width wise and will be using up land that has never been build on. Expansion within the air cargo planning area, airport-related use planning area, commercial aviation planning area, general aviation planning area, airport operations area, light industrial area, aeronautical land use area, and open space areas will add fill into existing wetlands and change the land use by building on it. The use of land zoning is not changing, but the physical land use will be changing and taking on a heavier burden to support more air traffic, transportation, storage, and commercial use. However, with the available research and information provided it has been decided that the land will be able to support the proposed action changes to it and there will be no significant impacts on land use.

Alternative Action Impact

There are no changes to the current or proposed action of land use for the project area and there will be no significant impacts.

No Action Impact

If this project is not done, there would be no significant impact on the lands use.

3.5 ENERGY AND NATURAL RESOURCES

Existing Conditions

Currently BLI is using Cascade Natural Gas and Puget Sound Power for their gas and electricity usage. The airport is located within the City of Bellingham's urban service area and therefore uses water provided by the city primarily from the Lake Whatcom watershed. The forested area is currently being left alone, but has been logged previously. No oil, woodstove, or solar energy is being used at the site at this time.

Proposed Action Impact

Temporary use of electricity will be used for the construction site, mainly for lighting the area in the dark or running equipment. After construction there will be more buildings that will be using more electricity than the existing usage. Gasoline and diesel fuel will be used for vehicles and construction equipment on site. Also, natural gas and propane may be used in small quantities for construction equipment. There are projected increases in flights which would mean more fuel (gasoline) for those airplanes. The increase in fuel for plane is approximately 45,000 gallons per month. The fuel stations available would be able to handle this load. No mitigation or conservation methods have been included to reduce the use of energy for the proposed action because there should be no significant impact to the usage or the source of the energy and natural resources.

Alternative Action Impact

The alternative action that has been proposed would use almost the same amount of energy and natural resources as the proposed action. There is no significant impact on the energy and natural resources and no mitigation measures would be necessary.

No Action Impact

There would be less energy and natural resources used if no action occurred because there would be no construction for usage or future buildings and flights that would add to the current usage. There would be no significant impact and no mitigation measures would be necessary.

3.6 HOUSING

Existing Conditions

Within the Bellingham International Airport there does not exist any residential units (Port of Bellingham, 2009).

Proposed Action Impact

The project proposal for the BLI expansion does not include a provision for building any housing units (Port of Bellingham, 2009). Furthermore, the project proposal is not expected to expand the amount of surrounding residential housing units it impacts already nor increase the impact it already has on those it already does impact.

Alternative Action Impact

The alternative would have no impact on housing at the BLI.

No Action Impact

There will be a continuation of no housing needed or provided at the BLI.

3.7 RECREATION

Existing Conditions

The only recreational opportunity within the BLI is a scenic trail, the Coat Millennium Trail, which runs through the south-west end of the property (Bellingham Parks & Recreation, 2005).

Proposed Action Impact

The proposed current project area (see Figure 10) would not impact the Coat Millennium Trail.

Alternative Action Impact

The alternative would have no impact on recreational opportunities such as they are at the BLI.

No Action Impact

Existing conditions of the Coat Millennium Trail would continue unaltered.

Bellingham International Airport Recreational Trail Map

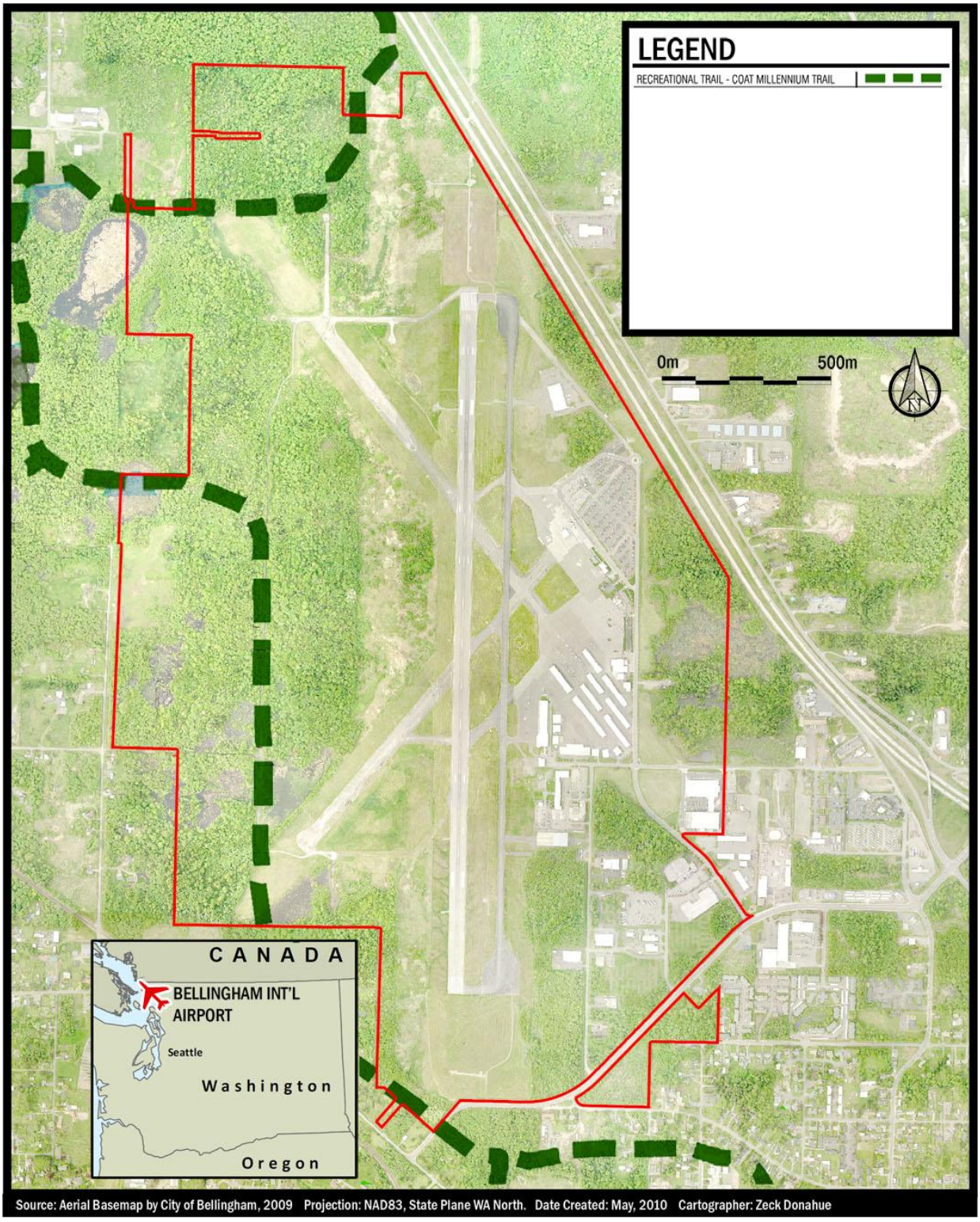

Figure 12- Map displaying recreational trails found near and on Bellingham International Airport property

3.8 HISTORIC AND CULTURAL PRESERVATION

Existing Conditions

There are not any historically architectural or archaeological places or objects so far found by the Department of Archaeology and Historic Preservation (DAHP) within the airport property of the BLI (Department of Archaeology & Historic Preservation (DAHP), 2010).

Proposed Action Impact

According to the DAHP (see Figure 11), the proposed project would have no impact on any historic or cultural places or objects (DAHP, 2010). However, other studies privately funded by the Port of Bellingham, the Archaeological Survey and Cultural Resource Evaluation for Developments, to find and record any historically architectural or archaeological places or objects within the development sites that might be impacted have yet to be made available to the public.

Alternative Action Impact

The alternative would have no known impact on any historic and cultural places or objects.

No Action Impact

Existing conditions at the Bellingham International Airport would continue unaltered.

Washington Information System for Architectural and Archaeological Records Data Map

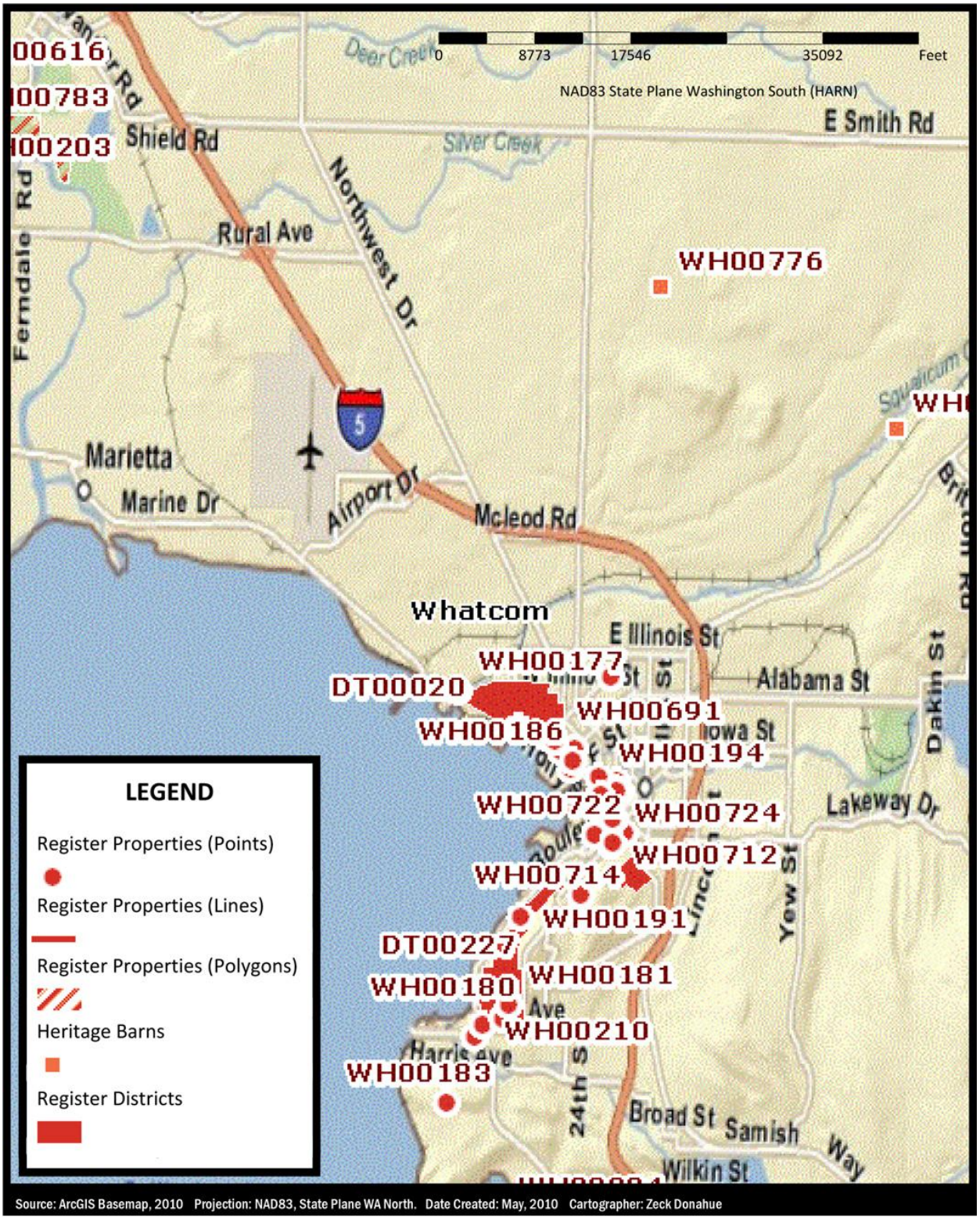

Figure 13- Map displaying recognized and protected archaeological and registered sites in Bellingham, Washington.

3.9 PUBLIC SERVICES

Existing Conditions

The Bellingham International Airport is located within the urban service area of the city limits of Bellingham. Currently the Bellingham International Airport is served by volunteer Whatcom County Fire District No. 8, its own crash-rescue services, and the local Whatcom County Sheriff Department ("Interlocal Agreement," 2008).

Proposed Action Impact

The projected airport expansion proposal would not increase the need of public services already being rendered to the airport. If the situation existed that the airport expansion did lead to an increase in use of the fire, medical and crash fire rescue services, there already exists a signed agreement between the Port of Bellingham and Whatcom County Fire Protection District No. 8 that the Port would cover the additional costs to the local fire department ("Interlocal Agreement," 2008).

Alternative Action Impact

The alternative would have no impact on the public services found at the Bellingham International Airport.

No Action Impact

Existing public services would continue unaltered.

3.10 Aesthetics

Existing Conditions

There is currently one high building, the control tower, which stands 100 feet tall. This blocks only a very small piece of the skyline, thus having a small impact on the aesthetic value of the horizon (Port of Bellingham, 2009).

Proposed Action Impact

The destruction and paving over of these wetlands surrounding the airport will come with a cost in the beauty for the flora and fauna that is native to the area. The newly constructed architectures must fit the patterns of the existing to maintain attractiveness for the community

who views it. The height if the proposed building will not have an impact on the landscape of the current skyline.

Alternative Action Impact

There will be no further detriment to the aesthetic value of the BLI area. In the end there is expected to be an equal or greater aesthetic value of the area. The new parking lot and building structures are expected to match the ones that already exist.

No Action Impact

The aesthetic conditions of the appearance of the airport and the natural skyline will remain as they are currently.

3.11 LIGHT AND GLARE

Existing Conditions

Bellingham International Airport site currently has various lighting intensity levels that are required for airport operations and light-industrial uses; however no measurements have been taken at the site (Port of Bellingham, 2009).

Proposed Action Impact

This project will need additional lighting that is necessary for light-industrial, retail, office, storage and other operations related to airport use. There is no way to measure whether this change is significant, because there is no baseline to measure significant impacts from. Any additional lighting that results from the project will not be a safety hazard or interfere with views (Port of Bellingham, 2009).

Alternative Action Impact

Impacts under the alternative action will be the same as under the proposed action.

No Action Impact

A no action approach will result in a continuation of the status quo, and there will be no change.

3.12 UTILITIES: WATER AND SEWER

Existing Conditions

The Bellingham International Airport is located within the urban service area of the city limits of Bellingham and is currently services with city water and sewer (Port of Bellingham, 2010).

Proposed Action Impact

The projected proposal will have no impact on the airports current water and sewer lines as pump stations installed in the 1980's were built to cover any future development projects (Port of Bellingham, 2010). In addition, there is no data to suggest that the airport expansion will lead to an increase in water and sewage beyond what the city has already allotted to the airport (Port of Bellingham, 2009).

Alternative Action Impact

The alternative would have no impact on the water and sewer utilities found at the Bellingham International Airport.

No Action Impact

Existing water and sewer utilities would continue unaltered.

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