

ORCAS ISLAND AIRPORT

Final Environmental Assessment

For

Obstruction Removal

October 2016

Prepared for:

Port of Orcas

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Acronyms

ACHP Advisory Council on Historic Preservation

Airport Orcas Island Airport

APE Area of Potential Effect

BA Biological Assessment

BMP best management practice

CEQ Council on Environmental Quality

CERCLA Comprehensive Environmental Response, Compensation and Liability Act

CO carbon monoxide

DAHP Washington State Department of Archaeology and Historic Preservation

dB decibels

dBa A-weight decibels

DNL day/night average sound level

DOE Washington State Department of Ecology

DOT U.S. Department of Transportation

E.O. Executive Order

EA Environmental Assessment

EFH Essential Fish Habitat

ESA Endangered Species Act

FAA Federal Aviation Administration

FAR Federal Aviation Regulation

GAO General Accounting Office

GHG greenhouse gas

ICAO International Civil Aviation Organization

MBTA Migratory Bird Treaty Act

MSL mean sea level

NAAQS National Ambient Air Quality Standards

NEPA National Environmental Policy Act

NMFS National Marine Fisheries Service

NO₂ nitrogen dioxide

NOAA National Oceanic and Atmospheric Administration

NO_x nitrogen oxide

NPDES National Pollutant Discharge Elimination System

NRHP National Historic Preservation Act

 O_3 ozone

Pb lead

PM particulate matter

PM₁₀ particulate matter smaller than 10 microns in diameter

Port Port of Orcas

RCRA Resource Conservation and Recovery Act

SHPO State Historic Preservation Office

SO₂ sulfur dioxide

T&E Threatened and Endangered

THPO Tribal Historic Preservation Office

USEPA U.S. Environmental Protection Agency

USFWS U.S. Fish and Wildlife Service

VOC volatile organic compound

WDFW Washington Department of Fish and Wildlife

WSDOT - Aviation Washington State Department of Transportation – Aviation Division

Chapter 1 Introduction

Environmental Assessment for Obstruction Removal – Orcas Island Airport

1.1 Background and History of Proposed Action

This Environmental Assessment (EA) has been prepared in accordance with the guidance provided in Federal Aviation Administration (FAA) Order 1050.1F *Environmental Impacts: Policies and Procedures* (July 2015) and Order 5050.4B *National Environmental Policy Act [NEPA] Implementing Instructions for Airport Projects.*

The Orcas Island Airport (Airport) is located in San Juan County, Washington, approximately one mile from the Island's business center of Eastsound. San Juan County is in northwestern Washington and is comprised of four major islands and over 700 smaller ones. Orcas is the second most populated island with about 4,500 residents. The four major islands, Orcas, San Juan, Lopez, and Shaw, are all served by the Washington State Ferry System. Three of the four have public airports with the exception of Shaw.

The critical need for air service united Orcas Island residents to form their own port district in 1959. A public meeting took place on August 1, 1958 with an election to form the port district and to create a public airport. The vote was overwhelmingly in favor of both measures. The Port of Orcas (Port) came into operation January 12, 1959. The Port then purchased property and the private airstrip for \$14,000. From the 1970s-1990s, the Airport went through expansion and construction projects with the financial assistance of Washington State Department of Transportation – Aviation Division (WSDOT-Aviation) and the FAA.

The Port now has five commissioners, and the Airport is managed by a professional airport manager. According to a 2012 WSDOT-Aviation study, the Airport provides approximately \$6.4 million in direct, indirect, and induced economic impacts. This estimate includes jobs, salaries, and contributions to the local economy.

The 64-acre Airport has a single runway, Runway 16-34, which is 2,900 feet long and 60 feet wide. According to the 2008 Airport Layout Plan Update, there were approximately 26,250 annual aircraft operations and more than 6,400 passengers were served, with 75 based aircraft in 2005. Commercial air service is provided with other businesses offering freight, recreation, and flight instruction.

A 2014 obstruction survey identified numerous obstructions to the Runway 34 Federal Aviation Regulation (FAR) Part 77 approach surface. To improve the 20:1 visual approach surface for Runway 34, vegetation removal is proposed to clear current and future potential obstructions. The vegetation proposed for removal is within Port-owned property in the approach / departure zone to the south of the airport operations area. These trees are hazardous to operational safety because of their height and are growing into regulated airspace.

The Port of Orcas has undertaken this EA to evaluate the potential impacts of the proposed vegetation removal project needed to clear the visual approach surface. **Exhibit 1-1**, Vicinity Map, illustrates the Airport, project area and the surrounding area.



Exhibit 1-1 Vicinity Map

Chapter 2 Purpose and Need

Environmental Assessment for Obstruction Removal – Orcas Island Airport

This chapter describes the conditions at the Airport, identifies the Purpose and Need for the Proposed Action, and describes how the components of the Proposed Action will address the Purpose and Need. It also describes the Proposed Action and the anticipated timeframe for implementing the action.

According to the Federal Aviation Regulation (FAR) Part 77, there are currently obstructions to the Runway 34, 20:1 visual approach surface.

2.1 Purpose and Need for the Proposed Action

This section describes FAA airspace obstruction regulations. Further detail is provided to describe how the components of the Proposed Action would correct the obstruction penetrations in the approach surface that are necessary to comply with FAR Part 77.

2.1.1 Obstructions to FAR 77, 20:1 Approach Surface

The FAA regulates the airspace surrounding an airport to provide a safe operating environment for aircraft. FAR Part 77.25, *Objects Affecting Navigable Airspace*, defines airport imaginary surfaces which are established to protect the airspace immediately surrounding a runway. The airspace and ground areas surrounding a runway should be free of obstructions (*i.e.*, structures, terrain, trees, etc.) to the greatest extent possible. One of these imaginary surfaces is the approach surface. The visual approach surface at the Airport extends outward and upward at a slope of 20:1, beginning 200 feet from the end of the runway along the extended runway centerline. The approach surface has a trapezoidal shape and is 5,000 feet long, and has inner and outer widths of 250 feet and 1,250 feet, respectively.

Based on an obstruction survey completed in February 2014, there are numerous tree penetrations to the approach surface of Runway 34. More trees will likely penetrate the approach surface in the future, based on the current tree height and species of trees present. The Airport proposes clearing the vegetation within the approach surface on Port-owned property to protect the 20:1 visual approach surface for Runway 34, as shown in **Exhibit 2-1**

2.1.2 Purpose and Need of the Proposed Action

The purpose of the proposed action is to remove existing and future obstructions located within the Runway 34, 20:1 visual approach surface in accordance with FAR Part 77 on Port-owned property.

The proposed action is necessary because the current approach surfaces for Runway 34 does not meet the FAA regulations, which are meant to enhance safety. The proposed clearing of existing and future vegetation obstructions is needed to maintain the 20:1 visual approach surface for Runway 34.

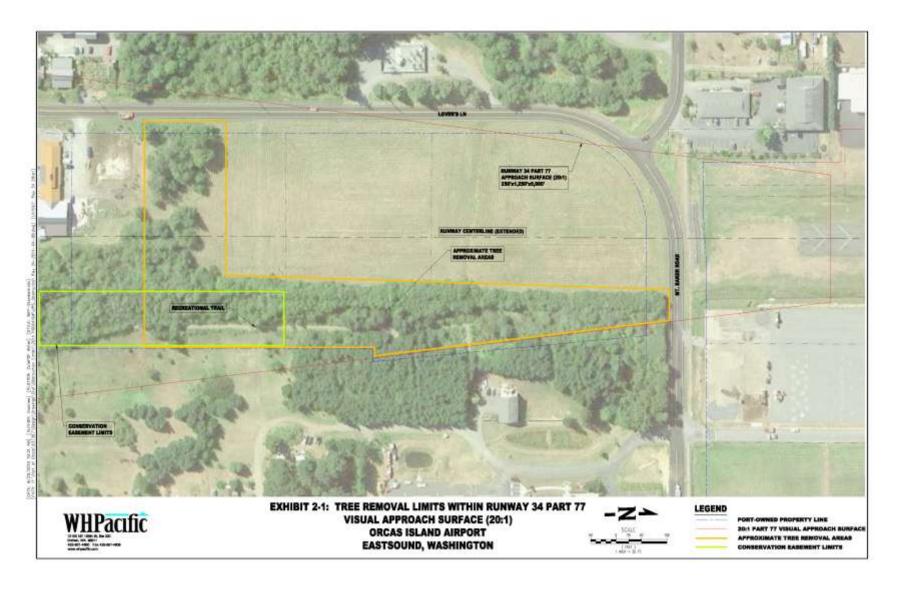


Exhibit 2-1 Tree Removal Limits Within Runway 34 Part 77 Visual Approach Surface 20:1

2.2 Elements of the Proposed Action

The Port of Orcas is proposing the following actions at the Airport in order to address the stated Purpose and Need:

Clear obstructions (vegetation) that currently penetrate the FAR Part 77, 20:1 visual approach surface
off of Runway 34 on Airport property. Vegetation that is likely to penetrate the approach surface in
the future will also be cleared.

2.3 Proposed Federal Actions and Estimated Timeframe

The requested Federal Action is the approval of FAA funding and approval for Proposed Action, which is further described in Chapter 3, *Alternatives*.

The Proposed Action is anticipated to be completed outside of the bird nesting season and during the dry season. Timing is dependent upon funding availability.

FAA will make an environmental finding based upon the analysis in this document and the comments received from the public on the Draft EA.

Chapter 3 Alternatives

Environmental Assessment for Obstruction Removal – Orcas Island Airport

This Chapter identifies and analyzes alternatives that address the deficiencies discussed in Chapter 2, *Purpose and Need*. The analysis has been prepared in accordance with the Council on Environmental Quality (CEQ) regulations (40 CFR Section 1502.14) for implementing the National Environmental Policy Act (NEPA), which require that Federal agencies perform the following tasks:

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

The following section describes the method by which alternatives were identified and evaluated to meet the Purpose and Need.

3.1 Obstruction Removal Alternatives

The Alternatives presented below address the obstructions to the Runway 34 approach surface. **Exhibit 2-1** illustrates the FAR Part 77 visual approach surface, existing vegetation, and areas where the vegetation penetrates the approach surface. The visual approach surface begins 200 feet beyond the runway end and extends upward and outward at a rate of 20:1 for 5,000 feet. The surface's inner width is 250 feet, with an outer width of 1,250 feet.

The Airport proposes to clear vegetation obstructions on Port-owned property within the visual approach surface. The area in question is dominated by willow and red alder toward the north; Douglas fir, willow, and red alder toward the south. The vegetative understory throughout the forested area is comprised of English hawthorn, pea-fruited rose, Himalayan blackberry, and sweetbriar rose (see **Appendix A**, Biological Evaluation Memorandum). Along the eastern portion of the forested area are densely planted stands of Douglas fir. Some of the area is designated wetland. A portion of the Port-owned property was granted easements for the purposes of 1) public pathway and 2) wetland conservation. Obstruction clearing and maintenance activities are allowed within these easements.

The following section provides a brief description and evaluation of the proposed Alternatives.

3.1.1 No Action Alternative (Alternative 1)

Under the No Action Alternative, obstructions (vegetation) in the Runway 34 approach surface would remain. Additionally, some vegetation that is currently below the surface would likely grow to become future

obstructions. The vegetation within the approach surface would continue to pose a hazard to aircraft operations.

This alternative does not meet the Purpose and Need of the project as it does not remove objects penetrating the airspace. This would lead to a reduction of the usable runway length in order to maintain a clear approach for aircraft operations and negatively impact the ability of certain aircraft to continue safe operation at the Airport. This alternative will be included in the analysis as required per CEQ and NEPA.

Key Features of the No Action Alternative:

- There are no environmental impacts on- or off-site.
- It does not remove vegetation that has grown or potentially would grow into the FAR Part 77 visual approach surface.

3.1.2 Alternative 2

Alternative 2 includes complete vegetation removal, consisting of all trees, shrubs, and stumps within the Runway 34 visual approach surface, including the wetland conservation easement area.

This alternative would meet the Purpose and Need at the present and for the foreseeable future as it removes the existing and potential obstructions in the approach surface on Port-owned land. This alternative would disturb the wetland conservation easement area, which is intended to protect the natural and ecological features.

Because of its potential impact on portions of the conservation easement area, Alternative 2 will not be considered for further analysis.

3.1.3 Alternative 3

Alternative 3 includes complete vegetation removal, consisting of all trees, shrubs, and stumps within the Runway 34 non-precision approach surface as shown in **Exhibit 3-1**. The 34:1 non-precision approach surface is a trapezoidal shape that is 5,000 feet long with inner and outer widths of 500 feet and 2,000 feet, respectively. The Port owns the land in the center portion of the non-precision approach surface. There are multiple private owners within the remainder of the approach surface areas. This alternative would meet the Purpose and Need as it removes the existing and potential obstructions in the approach surface; however, a portion of the vegetation removal area is located outside of the Port-owned property and would require landowner permission or potential purchase of the easements.

Because the non-precision approach surface covers areas outside of the Port-owned property, Alternative 3 will not be considered for further analysis. The Port is scheduled to conduct an Airport Master Plan Update next year, when a full obstruction analysis will be conducted for all the FAR Part-77 surfaces as part of the Master Plan Update.



Exhibit 3-1 Runway 34 Part 77 Non-Precision Approach Surface (34:1)

3.1.4 Alternative 4

Alternative 4 consists of the complete vegetation removal (trees and shrubs, including stumps), within the visual approach surface – not including the wetland conservation easement area – as illustrated in **Exhibit 2-1** Within the wetland conservation easement area, tree species that penetrate or have the potential to penetrate the 20:1 visual approach surface would be selectively removed, while the stumps would remain in place to minimize impacts to the ground and wetlands.

This alternative would satisfy all of the project's Purpose and Need by:

- Full vegetation removal (all trees and shrubs, including stumps) within the approach surface on Portowned land, excluding the wetland conservation easement area.
- Within the wetland conservation easement area, all trees currently penetrating or with the potential to penetrate the approach surface would be removed, while leaving the stumps and undergrowth in place, to minimize ground and wetland disturbance and impacts. San Juan County was consulted on this project and their written consent in included in **Appendix B**.

Alternative 4 does address the Purpose and Need of the project as it removes all the current and potential future obstructions located within the 20:1 visual approach surface in the foreseeable future.

The alternative provides a long-term solution for surface approach penetrations. Additionally, there would be minimal ground disturbance within the conservation easement area. For these reasons, Alternative 4 is chosen as the Preferred Alternative for obstruction removal.

The key features of the Proposed Action:

- It would remove current and potential future obstructions within the Runway 34 visual approach surface.
- It would minimize ground disturbance within the conservation easement area.
- It would not impact private land.

The Proposed Action meets the project's Purpose and Need.

Chapter 4 Affected Environment

Environmental Assessment for Obstruction Removal – Orcas Island Airport

The Affected Environment chapter succinctly describes the environmental conditions of the project area. As described in 40 CFR 1502.15, this section is concentrated on the project area and gives particular attention to important issues. It provides sufficient data and information to determine the level of potential impact for each resource category.

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, requires the evaluation of the following resource categories:

- Air Quality
- Biotic Resources
- Compatible Land Use
- Vegetation Removal (typically Construction) *
- Department of Transportation Act, Section 4(f) Resources
- Federally listed Endangered and Threatened Species
- Energy Supplies, Natural Resources, and Sustainable Design
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Farmlands
- Floodplains
- Hazardous Materials
- Historical, Architectural, and Cultural Resources, including Native American and Tribal Resources
- Light Emissions and Visual Effects
- Noise
- Solid Waste
- Water Quality
- Wetlands
- Greenhouse Gases/Climate
- Cumulative Impacts *

For the purpose of this EA, two elements are not applicable: Coastal Resources and Wild and Scenic Rivers.

• Coastal Resources laws pertain to marine coastal areas on the Atlantic, Pacific and Gulf coasts of the United States. The project site is outside of any areas regulated under shoreline or coastline laws.

^{*} Vegetation Removal and Cumulative Impacts are the result of selecting a clearing alternative, and the impacts to these categories will be discussed in Chapter 5, *Environmental Consequences and Mitigation*.

- The Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) was developed to protect certain free flowing rivers with outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values.
- Based on a review of the National Park Service website (www.rivers.gov/washington.php), there are
 no rivers in the project vicinity designated as Wild and Scenic or on the Candidate Rivers for Wild and
 Scenic listing.

No further discussion or analysis of these elements will be included in the EA.

4.1 Airport Location and Study Area

Orcas Island is located in Washington's Puget Sound in San Juan County. The Airport is located less than 1 mile north of the Village of Eastsound and is part of the Urban Growth Area. The Airport is located on a low-lying narrow section of the Island that has a width of approximately 1 ¼ miles and an elevation of approximately 30 feet mean sea level (MSL).

San Juan County consists of 176 named islands and reefs (up to 743 at low tides), with a population of 15,769 (2010 Census). The largest islands in the County are San Juan, Orcas, Lopez, and Shaw. The area is served by the Washington State Ferry System. Access to the Airport is provided via Mt. Baker Road and Schoen Lane.

The Airport land is governed by San Juan County's Code. According to the Eastsound Subarea Plan, the Airport resides in the County's Eastsound Airport District and is further addressed in San Juan County's Municipal Code, Section 16.55.280. Briefly, the purpose of this District is to accommodate the existing airport and provide for airport-related facilities and services within the Airport Use District, to allow for new compatible airport-related facilities and services, to allow for limited service and light industrial uses compatible with airport uses, and to prohibit residential development. Furthermore, it states that all development in the District must comply with FAR Part 77, relating to heights of land uses proximate to airports and protection of airspaces critical to airport operations, and that all development must comply with FAA Advisory Circular 150/5370-10, Standards for Specifying Construction on Airports.

The San Juan County zoning ordinance includes an Airport Overlay District, which is based on FAR Part 77 regulations to further mitigate the adverse impacts of new development on airport operations.

Existing land uses within a mile of the Airport are:

- Marina to the north
- Service and Light Industrial located all directions from the Airport
- Village Residential (4-12 units/acre) to the south
- Eastsound Residential (2 units/acre) to the west
- Eastsound Residential (4 units/acre) to the east

4.2 Air Quality

In accordance with the Clean Air Act Amendments of 1990, the Federal government cannot approve an action that is not supportive of the attainment and maintenance of National Ambient Air Quality Standards (NAAQS) conformity. Conformity is intended to ensure that the Federal government does not take, approve or support actions that are in any way inconsistent with a state's plan to attain and maintain the NAAQS for criteria pollutants. Conformity applies to areas designated as "maintenance" or "non-attainment" for any of the criteria

pollutants. Six pollutants are typically monitored and regulated. These include carbon monoxide (CO), particulate matter (PM), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and nitrogen oxide (NO_x). Particulate matter is further monitored as to the size of particles. PM₁₀ is the most critical, as it represents particles smaller than 10 microns, which are easily inhaled and can remain in the lungs.

Geographic areas are classified as "non-attainment" if standards for one of the monitored pollutants are violated. "Maintenance" areas are those geographic areas that had a history of non-attainment, but are now consistently meeting the NAAQS. Areas classified as "attainment" are typically monitored for these standards, but no violations have occurred. Areas are "non-classified" if air quality is generally not a concern. San Juan County, including Orcas Island, is non-classified.

4.3 Biotic Resources (including Threatened & Endangered Species)

Biotic resources include plant and animal communities in the project study area. Included in this discussion are Threatened and Endangered (T&E) species. Section 7(C) of the Endangered Species Act (ESA) requires that Federal agencies contact the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) prior to any construction activity to determine if any proposed or listed T&E species may be in the project area. If the USFWS or NMFS determines that T&E species under their respective jurisdictions may be affected, a Biological Assessment (BA) must be prepared. If species are not present or a Biological Evaluation shows no effect, no BA is needed.

A detailed *Biological Evaluation Memorandum*, including recent photographs of resources found in the project area, was prepared by WHPacific, Inc. and is included in **Appendix A**.

WHPacific staff completed a pedestrian survey of the project area on June 10, 2014. Plant species and communities, and observed bird species were identified and recorded. The USFWS species list for San Juan County, Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species database, and NMFS Essential Fish Habitat database were reviewed prior to field investigations.

The largest portion of the study area lies north of Mt. Baker Road within the boundaries of the Airport fence. Some wetlands exist within this portion of the study area. Vegetation communities consist of mowed grasses between pavement surfaces, including common meadowgrass (Poa pratensis), tall fescue (Schedonorus arundinaceus), meadow brome (Bromus erectus), and other Agrostis, Poa, and Bromus spp. Avian species typical of mowed-grass airport environments include killdeer, European starlings, American robins, gulls, geese, waterfowl, and occasional raptors. The Airport perimeter is surrounded by an eight-foot high fence to prevent deer and other wildlife from entering the property.

The southern portion of the study area across Mt. Baker Road includes a large open field of tall grasses and an adjacent forested area, both of which contain wetlands. The western portion of this area is an open field which is primarily wetland with native and non-native grasses, sedges, rushes and forbs including velvetgrass (Holcus lanatus), soft rush (Juncus effusus), tall fescue, slough sedge (Carex obnupta), and another unidentified sedge (Carex sp). The general topography is hummocky with surface saturation present at low points and standing water up to one inch in very few places. In general, water flows from the tree removal area north across Mt. Baker Road into the airport.

The adjacent forested portion of this area and the site of proposed vegetation removal is dominated by willow (Salix spp.) and red alder (Alnus rubra) with a typical diameter at breast height (DBH) of 2-4" toward the north, and Douglas fir (Pseudotsuga menziesii), willow, and red alder with typical DBH of 6-8" toward the south. The

understory throughout the forested area is comprised of English hawthorn (Crataegus monogyna), pea-fruited rose (Rosa pisocarpa), and some Himalayan blackberry (Rubus armeniacus) and sweetbriar rose (Rosa rubiginosa). Along the eastern portion of the forested area are densely planted stands of Douglas fir with little understory or light penetration. No obvious avian nesting behaviors were observed in the study area, though dense forest and understory in the obstruction removal portion of the study area made it difficult to see in some places. Avian species observed using the proposed vegetation removal area included Swainson's thrush, cedar waxwing, American robin, and other passerines. All observed avian species are not listed as Federal or state T&E, but most are protected by the Migratory Bird Treaty Act (MBTA).

The USFWS and WDFW T&E species databases were reviewed prior to field investigations. None of the listed species were observed during field survey and suitable habitat for these species does not exist within the project area. Additionally, National Oceanic and Atmospheric Administration Fisheries, WDFW Priority Habitat and Species List, and San Juan County's 2014 Critical Area Ordinance were reviewed (per **Appendix A**).

Critical and priority habitats associated with the project were also researched using online databases for USFWS, WDFW, and NMFS. WDFW database search results show palustrine habitat covers most of the area of proposed obstruction removal. Nearby, but outside of the study area, palustrine habitat is west and adjacent to the Airport, and saltwater environs are located off of the north end of the runway containing marine intertidal aquatic habitat and pinto abalone (Haliotis kamtschatkana). A bald eagle (Haliaeetus leucocephalus) breeding area, wetland and palustrine areas are noted within a quarter mile to the west of the north end of the runway. Additionally, a wetland delineation of the study area was conducted (See Section 4.19, and **Appendix C**), which documented one wetland (D) and one ditched channel (3) within the project area.

The NMFS Essential Fish Habitat (EFH) database was reviewed prior to field investigations to determine presence of EFH within the study area. No EFH exists within the study area. A ditched channel (Stream 3) through the on-site portion of Wetland D appears to have been intentionally created several decades ago to control and convey the hydrology within the wetland for agricultural use. The ditched channel conveys natural hydrology, so is classified as a stream. The numerous blocks and lack of spawning habitat are indicators that the ditched channel would not be accessible nor suitable habitat for fish. There was no documented evidence that it supports fish habitat.

4.4 Compatible Land Use

The compatibility of existing and planned land uses near an airport is usually associated with the extent of the noise impacts. Airport development actions to accommodate fleet mix changes or the number of aircraft operations, air traffic changes or new approaches made possible by new navigational aids are examples of activities that can alter aviation-related noise impacts and affect land uses subjected to those impacts.

Existing land uses within a mile of the Airport consist primarily of Service and Light Industrial, and also includes some Residential with densities ranging from two to 12 units/acre. Noise contours have not been prepared for the Airport. According to the FAA's Environmental Desk Reference, Chapter 17, a noise analysis need not be conducted if annual operations are below 90,000 for piston-powered aircraft and 700 for jet-powered aircraft. According to FAA's Form 5010, the Airport's total annual aircraft operations is 41,800. Airport management estimates those operations can be further detailed as such: 37,800 piston-powered, 3,550 turboprop, 100 turbofan/jet, and 350 helicopters.

4.5 Department of Transportation Act, Section 4(f) Resources

The Federal statute that governs impacts in this category is commonly known as the U.S Department of Transportation (DOT) Act, Section 4(f) provisions. Section 4(f) of the DOT Act, which is codified and renumbered as Section 303(c) of 49 U.S.C., provides that the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from an historic site of national, state, or local significance as determined by the officials having jurisdiction thereof – unless there is no feasible and prudent alternative to the use of such land and such program, and the project includes all possible planning to minimize harm resulting from the use.

A review of maps of San Juan show a number of potential resources in the airport vicinity. Doughty Point Park (San Juan County) is approximately 1.5 miles west of the Airport. Turtleback Mountain Preserve (San Juan County Land Bank) is about 3.5 miles southwest of the Airport, and Moran State Park (Washington State Parks) is about 3.5 miles southeast.

Within land owned by the Port, south of the Airport, between Mt. Baker Road and Enchanted Forest Road is a recreational trail, granted through an easement to the County. This trail is considered a 4(f) resource and is protected for the purposes of a recreational trail. The 10-foot wide easement is for non-motorized ingress/egress and provides written allowances to maintain and improve the area including the removal of trees and vegetation. Portions of the trail are in the project area.

4.6 Federally Listed Endangered and Threatened Species See Section 4.3.

4.7 Energy Supplies, Natural Resources, and Sustainable Design

Executive Order (E.O.) 13123, *Greening the Government through Efficient Energy Management*, encourages each Federal agency to expand the use of renewable energy within its facilities and in its activities. The order also requires each Federal agency to reduce petroleum use, total energy use and associated air emissions and water consumption in its facilities. According to the FAA Environmental Desk Reference for Airport Actions (2007), the FAA supports projects that promote environmental sustainability.²

Currently, electrical energy is used to power navigation aids, airport lighting, and airport buildings. Petroleum fuels are used to power aircraft, maintenance vehicles, and other equipment, such as generators.

Other natural resources affected by the Airport are described in the sections discussing water quality, wetlands, biotic communities, and T&E species.

4.8 Socioeconomics

FAA must evaluate proposed airport development actions to determine if they would cause socioeconomic impacts. Socioeconomic impacts include moving homes and businesses; dividing or disrupting established

² FAA *Environmental Desk Reference for Airport Actions*. Office of Airports, Office of Airport Planning and Programming, Airports Planning and Environmental Division, APP-400, (2007).

communities; changing surface transportation patterns; disrupting orderly, planned development; or creating a notable change in employment.

The principal impacts to consider are associated with relocating or disrupting a residential or business community, transportation capability, planned development or employment. Environmental documents should provide information on the individuals and families (e.g., numbers and characteristics) an action would displace and the effects of that displacement on the neighborhood; information on the capability of the neighborhood to provide adequate relocation housing for the families the action would displace; the businesses an action would displace and the effects of moving the businesses to other areas; and information on the areas' ability to provide replacement or new buildings or other features associated with the affected businesses.

Significant impacts may occur when there is:

- Extensive relocation, and sufficient replacement housing is unavailable.
- Extensive relocation of community businesses that would cause severe economic hardship for affected communities.
- Disruption of local traffic patterns that substantially reduce the Levels of Service of roads serving the airport and its surrounding communities.
- A substantial loss in community tax base.

The area surrounding the Airport is Service and Light Industrial mixed with some residential properties. The community is less populated in the winter months, in comparison to the summer months, as many of the properties are second homes to those who live on mainland Washington.

A portion of land owned by the Port, south of the Airport, between Mt. Baker Road and Enchanted Forest Road contains a recreation trail that was granted through an easement to the County. The proposed action includes removal of obstructions (vegetation) in this area to clear the FAR Part 77 approach surface. The trail itself would not be altered, aside from the removal of shade provided by the existing vegetation.

4.9 Environmental Justice

In recent years, concern about environmental impacts on particular populations has been growing; this type of impact is referred to as environmental justice. Low income and minority communities, for example, may bear a disproportionately high risk to human health and the environment from pollution and other effects of specific types of development or facilities. E.O. 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) provide the basis for this analysis.

The Airport has been in the community for over 55 years. Over time, the land uses around the Airport have remained low density residential, with Service and Light Industrial being the most prominent. Within the project area, or immediate vicinity, there are no concentrations of minority or low-income populations.

4.10 Children's Environmental Health and Safety Risks

FAA must evaluate project-related impacts with the potential to have a disproportionate effect on children's environmental health or safety. E.O. 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, provides a basis for this analysis and defines the risks to children's safety that are attributable to products or substances that the child is likely to touch or ingest. Examples include the air, food, water for drinking and

recreation, and soil for food production. An action causing disproportionate health and safety risks to children may indicate a significant impact.

Children are also more sensitive to certain types of impacts that may alter physical development or impact schools or other concentrations of children. Within the project area and immediate vicinity, there are no places where children congregate (e.g., schools, recreation centers, or daycare centers).

4.11 Farmlands

Certain types of soils are considered prime farmland because of their drainage, mineral, and other characteristics. These soils, when in urbanized or developed areas, are not considered prime due to the compaction and other activities that degrade the potential for farm use.

Across Mt. Baker Road, the majority of the area proposed for vegetation removal is Sholander-Speiden complex (0 to 15 percent slopes). The western edge of this area is in Deadmanbay-Morancreek complex (2 to 15 percent slopes).

According to the Soil Survey of San Juan County, Sholander-Speiden complex is considered prime farmland if it is irrigated. There is no irrigation on the Airport and in the vegetation removal area. The Deadmanbay-Morancreek complex is considered prime farmland soil. See Figure 4 in **Appendix C** (Wetland Compensatory Mitigation Plan) for U.S. Department of Agriculture-Soil Conservation Service soils maps.

There is no history of cultivation in this area, although it may have been used for grazing prior to the Airport's development.

4.12 Floodplains

Floodplains. E.O. 11988 directs Federal agencies to "take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains...." A review of on-line Flood Insurance Rate Maps, prepared by the Federal Emergency Management Administration shows the area is not within the mapped floodplain.

4.13 Hazardous Materials

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances, and wastes. The two most important statutes to the FAA for the NEPA analysis are the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of any release of hazardous substances, excluding petroleum, into the environment.

The Airport currently generates solid waste associated with aircraft use and the operation of a fixed base operator. Based on information presented in the San Juan County's Solid and Hazardous Waste Management Plan and a records search of Washington State Department of Ecology's Cleanup Site Search (https://fortress.wa.gov/ecy/gsp/sitesearchpage.aspx), there is no history of spills or dumping on the site. There is no reason to believe the ground is contaminated by hazardous material. If odor or visual clues are identified during vegetation removal, work would be halted, and an assessment of the contamination and remediation requirements would be prepared.

4.14 Historical, Architectural & Cultural Resources including Native American & Tribal Resources

A cultural resource inventory (**Appendix D**) that included a records review, pedestrian survey, and subsurface probing for the proposed improvements was completed. No cultural resources were identified during the survey of the proposed area of potential effect (APE). Analysis of LiDAR imagery and shovel probe data revealed that the proposed APE showed signs of filling at the southern end and potential cutting associated with field clearing or leveling, thus limiting the potential for encountering archaeological deposits in this area. The wetland conservation easement of the proposed APE appears to have been subject to limited development - primarily vegetation removal. A series of drainage ditches are located in the northern half of the conservation easement portion of the proposed APE, but they appear to be modern in origin and either currently support, or had previously supported, drainage of the airport runway. As such, the potential for encountering archaeological deposits in this area is also limited.

4.15 Light Emissions and Visual Effects

Vegetation removal may create impacts due to light emissions or visual impacts. These include increased visibility of airport lighting from off-site viewpoints and the potential to impact people or properties. The EA must consider the extent to which any lighting associated with the proposed action will create an annoyance among people in the airport vicinity or interfere with their normal activities.

Visual or aesthetic impacts are more subjective. Analysis of these impacts may include the extent that the proposed action contrasts with the existing environment and whether another agency considers the contrast objectionable.

The FAA regulates lighting that is used on an airport for navigation and directional information. There are also recommendations for minimization of light and glare that could affect a pilot's ability to see or understand airport lighting.

The Airport currently has a medium-intensity runway and taxiway lighting system. The Airport is also equipped with a rotating beacon, a lighted windsock, a two-light precision approach path indicator on the left side of Runway 34, and a four-light visual approach slope indicator on the left side of Runway 16. The lighting may be visible at night from adjacent home sites. Beyond the properties adjacent to the Airport, on-airport lighting is mostly contained on-site and does not spillover into the surrounding community. The beacon may be visible in excess of a mile from the Airport.

The area south of the Airport is mostly open land with patches of trees. The eastern edge of the area has dense vegetation. The trail through the area provides views of trees and shrubs.

4.16 Noise

For aviation noise analyses, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as FAA's primary metric. However, FAA Order 1050.1F, Appendix B, states

"No noise analysis is needed for projects involving Design Group I and II airplanes (wingspan less than 79 feet) in Approach Categories A through D (landing speed less than 166 knots) operating at airports whose forecast operations in the period covered by the NEPA document do not exceed 90,000 annual propeller operations (247 average daily operations) or 700

annual jet operations (2 average daily operations). Also, no noise analysis is needed for projects involving existing heliports or airports whose forecast helicopter operations in the period covered by the NEPA document do not exceed 10 annual daily average operations with hover times not exceeding 2 minutes."

As discussed in Section 4.4, the Airport annual operations consist of 41,800 aircraft. Therefore, the Airport is exempt from developing noise contours.

4.17 Solid Waste

There is no threshold of significance for solid waste. The impacts of a project would be considered significant if the solid waste generated by the project would exceed available landfill or incineration capacities or require extraordinary effort to meet applicable solid waste permit conditions or regulations, or if local, state, or Federal agencies determine that substantial unresolved solid waste issues are associated with the project.

Currently, the Airport generates solid waste from the existing Fixed Based Operators and from aircraft using the Airport. The quantity generated is minimal and is picked up as part of a regular garbage collection cycle.

Solid waste accumulation during vegetation removal is expected to be minimal.

4.18 Water Quality

Water quality is generally governed under the provisions of the federal Water Pollution Control Act, as amended by the Clean Water Act and other amendments. To comply with Federal law, Washington State Department of Ecology (DOE) maintains a listing of water bodies and impediments to meeting water quality standards for each body. These standards are typically thresholds for the presence of a particular element (such as dissolved oxygen or bacteria) or general conditions such as temperature or artificial stream banks.

For airports, the primary water quality effect is caused by any additional runoff generated from the creation of impervious surfaces. There is also some potential for impacts to water temperature, oil or fuel spillage, and de-icing chemicals to affect water quality. The Airport rarely, if ever, uses de-icing chemicals. Oil and fuel are used in airport maintenance and operations, as well as aircraft operations. The Port maintains a spill containment pad at its fueling station. The Port also maintains a set of procedures to be followed in the event of a spill, to prevent contaminants from entering the local waters. Incidental fuel or oil collected on hard surfaces is removed from runoff as it is conveyed through drainage swales.

The Airport collects, treats and maintains most of its stormwater on-site; therefore, the Port is not required to operate under the requirements of a National Pollutant Discharge Elimination System (NPDES) 1200-Z permit Schedule A, Storm Water Pollution Control Plan. For vegetation removal, the Port would need a 1200-C permit.

4.19 Wetlands

A delineation of wetlands and other waters in the project area was prepared after site visit June 3, 2014 (see **Appendix C**). WRI identified one wetland (Wetland D) and one ditched channel (Stream 3) within the project area.

Wetland D

Wetland D was historically part of a larger wetland complex that extends off-site to the south. It is classified as a depressional, forested wetland. Prior to development in the East Sound area, the wetland may have extended to Fishing Bay, located within 1/2 mile south of the site. The wetland contains a ditched channel (Stream 3), which was constructed for agricultural use many decades ago to control and convey the hydrology within the

wetland. Wetland D has moderate potential for hydrologic control and water quality improvement functions, as evidenced by its scores for these functions on the DOE wetland rating form. Wetland D receives a low score for habitat functions because it contains forested habitat with special habitat features and multiple water regimes.

The full wetland delineation report is included in **Appendix C**.

4.20 Greenhouse Gases/Climate

Greenhouse Gases (GHGs) are not directly discussed within FAA Order 1050.1F; however, the following section is included because research has shown there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and power generation (41 percent)³. The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally.⁴ Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.⁵

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in GHG emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., National Aeronautics and Space Administration, NOAA, U.S. Environmental Protection Agency, and DOE), has developed the Aviation Climate Change Research Initiative in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for AiR Transportation Noise & Emissions Reduction Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the ICAO.⁶

As discussed in Section 4.15, operations at the Airport are modest. The amount of GHGs created at the Airport are not known, but are likely minimal.

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³ Aviation and Climate Change. GAO Report to Congressional Committees, (2009).

⁴ Alan Melrose, European ATM and Climate Adaptation: A Scoping Study, in ICAO Environmental Report. (2010).

⁵ Climate Change Division, Office of Atmospheric Programs, USEPA, *Technical Support Document for Endangerment and Case or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3 (2009).*

⁶ Lourdes Q. Maurice and David S. Lee. *Chapter 5: Aviation Impacts on Climate*. Final report of the ICAO Committee on Aviation and Environmental Protection Workshop.

Chapter 5 Environmental Consequences & Mitigation

Environmental Assessment for Obstruction Removal – Orcas Island Airport

This Chapter provides a summary of the impacts of the two alternatives under analysis, No Action (Alternative 1) and the Proposed Action (Alternative 4), for each of the environmental elements described in the Affected Environment chapter. In some cases, the impacts may be short-term, generally associated with vegetation removal activity, or they may be long-term, associated with the upkeep of the vegetation in the approach surface at the Airport. In some cases, there may be no impact. Where applicable, the reader may be referred to an appendix containing a topic-specific report that provides greater detail.

5.1 Air Quality

5.1.1 Significance Criteria

The U.S. Environmental Protection Agency (USEPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of a primary and secondary standard for each pollutant. Air quality standards are the levels established to protect the public health and welfare from harm within a margin of safety. All areas of the country are required to demonstrate attainment with the NAAQS.

The DOE has established state ambient air quality standards that are at least as stringent as the national standards.

The air quality standards focus on limiting the quantity of six criteria pollutants:

- Ozone (O₃)
- Carbon Monoxide (CO)
- Nitrogen Dioxide (NO₂)
- Particulate Matter (PM₁₀ and PM_{2.5})
- Sulfur Dioxide (SO₂)
- Lead (Pb)

Volatile Organic Compounds (VOCs) are not a criterion pollutant and therefore no ambient air standards have been established for this pollutant. Since VOCs react with nitrogen oxides (NO_x) in sunlight to form ozone, VOCs, and NO_x emissions are included in this analysis.

FAA Order 1050.1F, Significance Threshold, identifies significant impacts if the action would "cause pollutant concentrations to exceed one or more of the NAAQS, as established by USEAP under the Clean Air Act, for any of the time periods analyzed, or increases the frequency or severity of any such existing violations."

Actions that would not increase airport capacity, lead to increased congestion of roadways or airfields, or relocate aircraft or vehicular activity closer to sensitive receptors are not likely to exceed the NAAQS for CO.

5.1.2 Analysis

An Air Quality Analysis was not prepared for this project, as it will not result in an increase in operations, and

the Airport is outside of any areas designated non-attainment or maintenance.

No Action Alternative

With the No Action Alternative, the proposed project would not be undertaken. Therefore, no project-related vegetation removal would occur, and there would be no additional emissions. Surface transportation emissions would continue to increase as background traffic increases.

Preferred Alternative

The use of heavy equipment, trucks, chippers and chain saws would be necessary to complete vegetation removal. These impacts are discussed under Vegetation Removal, Section 5.4.

As noted in the Purpose and Need and Alternatives Chapters of this EA, the Proposed Action would not alter the number of aircraft operations serving the Airport. Surface transportation emissions not related to vegetation removal would remain the same as in the No Action Alternative. The Preferred Alternative would not create changes to air quality beyond what would occur with growth in Airport operations.

5.1.3 Mitigation

No mitigation is required, as the proposed project would not result in an exceedance of the general conformity de minimis threshold (100 tons of project-related emissions); thus, no significant adverse impact is expected to occur with the proposed project.

5.2 Biotic Resources (including Threatened & Endangered Species)

5.2.1 Significance Criteria

According to FAA Order 1050.1F, *Significance Threshold*, a project should consider impacts on the biotic communities and consult with agencies and organizations having jurisdiction over or special expertise. According to FAA Order 1050.1F, for non-listed species, there is not an established significance threshold. A project would have impacts on biotic communities when the Proposed Action has the potential for:

- "A long-term or permanent loss or unlisted plant or wildlife species"
- "Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations"
- "Adverse impacts on a species reproductive success rates, natural mortality rates, non-natural
 mortality (e.g. road kills and hunting), or ability to sustain the minimum population level required for
 population maintenance."

FAA Order 1050.1F, *Significance Threshold*, states a project would have significant impacts on special status species when the USFWS or NMFS "determines that the action would be likely to jeopardize the continued existence of Federally-listed threatened or endangered species, or would result in the destruction or adverse modification of Federally-designated critical habitat in the affected area."

FAA Order 1050.1F further specifies that a project would have significant impacts on special status species when in addition to the criteria for non-listed species; the Proposed Action or alternatives would also create:

 "Adverse impacts to special status species (e.g. state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitat."

5.2.2 Analysis

Information in the *Biological Resources Evaluation Memo* (see **Appendix A**) describes four vegetation communities within the project vicinity. The report confirms that there are no listed terrestrial plant or animal species present, nor are there listed fish species in the project area. The habitat types are not unique within Orcas Island.

No Action Alternative

There would be no change to the habitat types found on and around the Airport, other than continued maintenance of grass in the mowed area, the habitat found within the maintained Airport area. There would be No Effect on Federal- or state-listed species.

Preferred Alternative

As designed, the proposed project is expected to have no effect on Federal- or state-listed species. Listed species or species of concern were not observed during field investigations, and are unlikely to be within the project area based on available habitat. Critical habitat does not occur within or near the project area. Avian species observed during the site investigation are not Federal-or state-listed as threatened or endangered, but are protected under the MBTA. Vegetation removal would occur after the nesting season.

No EFH occurs within the project area.

5.2.3 Mitigation

No impacts to Biotic Resources are expected as a result of the Proposed Action. Areas outside of the conservation easement would be seeded with grass.

5.3 Compatible Land Use

5.3.1 Significance Criteria

FAA Order 1050.1F, Significance Thresholds, states "the FAA has not established a significance threshold for Land Use. There are no specific independent factors to consider for Land Use. The determination that significant impacts exist in the Land Use impact category is normally dependent on the significance of other impacts."

5.3.2 Analysis

Noise impacts for the project fall into two general areas: aircraft noise and traffic noise. Noise modeling was not required for the Airport as the project would not change the runway length or alter the location of aircraft relative to sensitive receptors, nor does the current level of aircraft operations justify the need for noise modeling.

San Juan County has an Airport Overlay District that is intended to identify and protect the Airport by providing protective standards that are combined with the underlying zoning district to minimize the conflicts between airports and proposed future development. These protections prevent future incompatible uses and the establishment of airspace obstructions in airport clear zones, approaches and surrounding areas through height restrictions, and restrict noise-sensitive uses and regulate further establishment of uses sensitive to airport operations by precluding some uses and notification of airport impacts of other uses.

No Action Alternative

The No Action Alternative would maintain noise at its current level. Vehicle noise would likely increase over time because of new development and tourism. Aircraft operations and noise may increase over time.

Preferred Alternative

The Preferred Alternative vegetation removal activity would produce short-term noise effects (see Section 5.4). As described in the Purpose and Need, the Proposed Action would not cause an increase in Airport operations. Noise may increase over time, if aircraft and vehicular traffic volumes increase in the project vicinity from new development and tourism.

5.3.3 Mitigation

No mitigation measures are proposed, as the vehicular noise increases are not significant according to Title 23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, which cites significance when noise sensitive areas to experience an increase in noise of 10 A-weight decibels (dBA) or approaches 67 dBA. Additionally, because there is no change in the number of aircraft operations, the change in aircraft noise is not significant according to FAA criteria (an increase of 1.5 dBA or more above the 65 dBA noise exposure line).

5.4 Vegetation Removal

5.4.1 Significance Criteria

There is no threshold of significance for vegetation removal. Vegetation removal would be conducted in accordance with the guidance provided in FAA Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports*, Item P156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control (FAA, 1991).

5.4.2 Analysis

The No Action Alternative includes minor maintenance activities. The Preferred Alternative would be implemented over one season. The vegetation removal work would occur outside of the bird nesting season and during the dry season.

There are no vegetation removal-related impacts to the following resources, as the resource is not present in the project area or the resource is not subject to temporary impacts: Compatible Land Use, Cumulative Impacts, Environmental Justice and Farmlands.

The impacts of the project would predominantly be temporary, resulting from activities that are necessary to meet the project's purpose and need.

No Action Alternative

The No Action Alternative would have minimal impacts associated with ongoing maintenance.

Preferred Alternative

It is anticipated that vegetation removal would involve heavy-duty diesel equipment potentially traveling to Orcas Island via ferry. Vegetation removal personnel may consist of local workers and commuters.

Air Quality Impacts

Vegetation removal related air quality impacts would include the potential for airborne particulates as a result of exhaust from equipment. Equipment-related emissions would be primarily from the use of power tools (e.g. chain saws), trucks, chippers and loaders.

Biotic Resources

Timing of vegetation removal would avoid disturbance of nesting birds and to take advantage of dry conditions.

No EFH occurs within the project area. Erosion control would comply with the County and the Washington State Department of Ecology requirements, and follow Best Management Practices (BMPs) as described under Water Quality.

Department of Transportation Act, Section 4(f) Resources

Short-term vegetation removal activities runway would not affect Section 4(f) resources. Tree removal in the conservation easement area may require temporary closure of the trail to protect user's safety. Trail users would be given advance notice of the closures.

Federally-Listed Endangered and Threatened Species

No Federal-listed T&E species were found in the project area. Timing of vegetation removal would avoid impacts to any protected species under MBTA.

Energy Supplies, Natural Resources, and Sustainable Design

Vegetation removal impacts on energy supplies, natural resources and sustainable design would be minimal. The vegetation removal equipment may include gasoline powered saws, as well as diesel powered equipment, including chippers, loaders and trucks to remove wood-waste. Because of the island's remote location, the contractor may choose to provide on-site fueling for equipment. There would be no impact to fuel supplies on the island.

Vegetation removal activity would not have a short-term impact on natural resources such as sand, gravel or rock resources, and would have no impact on sustainable design features.

Floodplains

The vegetation removal project area is located outside of the flood zone.

Hazardous Materials

Any time fuel powered equipment is used, there is a risk of an accidental spill or leak. The contractor would be required to have a spill prevention and pollution control (SPPC) plan in place, and maintain a supply of absorbent materials on-site in the event a release occurs.

Historical, Architectural, and Cultural Resources, including Native American and Tribal Resources

The vegetation removal area also has a history of farming use. The Cultural Resources Report (**Appendix D**), and subsequent consultation with the potentially affected Tribes, suggest that resources are not likely to be present in the project work area. There is a remote possibility that during the earthwork phases, resources may be uncovered.

If any archaeological or historic materials are encountered, work would stop and the State and Tribal historic offices would be contacted. If materials that are considered sensitive are found, the Port and the contractor would:

- Implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering
- Take reasonable steps to ensure the confidentiality
- Take reasonable steps to restrict access

Socioeconomic Effects

Vegetation removal workers may come from off-island, increasing the demand for temporary housing or creating additional traffic on the Washington State Ferry system and on local roads. There may be increased use of Island shops, including restaurants and grocery stores. While vegetation removal may take place during "high season" for tourism, typical schedules would allow workers to arrive and depart outside of heavy recreational travel times.

Recreational users of the trail, including bicyclists and walkers, would need to find alternate recreation sites during the temporary trail closure. Users would be notified in advance of any closures.

Light Emissions and Visual Effects

During and after the vegetation removal process, the view of the area would change. Equipment would be visible south of the Airport.

Noise

The use of chainsaws, chippers, trucks and loaders would add to the background noise in the project area. There are no residences immediately adjacent to the vegetation removal areas.

Solid Waste

Removal of the vegetation would generate solid waste. The vegetation removed from the area within the visual approach surface may have marketable use including firewood or production of wood chips for landscaping. Other waste may include food, packaging and containers from oil, lubricants and other materials. The contractor would be required to provide a collection area for waste and arrange for its removal.

Water Quality

The areas outside of the conservation easement would be seeded with grass after vegetation removal. There would be the potential to create erosion before the grass begins to grow. Because the project disturbs more than one acre of land, vegetation removal would require a NPDES 1200C Construction Stormwater Permit. The NPDES 1200C Permit focuses on preventing pollution from erosion and runoff by requiring protections such as erosion-control fencing and the use of BMPs. In addition, permittees are required to inspect and maintain their controls to ensure they are working properly to prevent erosion and sediment runoff from leaving the site. Other BMPs may also be required, per FAA Order 1050.1F and FAA Advisory Circular 150/5370-10A.

Additionally, water quality impacts may occur from fuel or lubricant spills, as discussed in Hazardous Materials section. Secondary containment would be required when refueling equipment and spill kits would be on hand in case of an accidental release.

Wetlands

Wetland D may also incur soil disturbance related to vegetation removal equipment. Stream 3, also in the vegetation removal area, would be protected by erosion control devices and by performing work during the dry season. Tree stumps would be left in-ground in the conservation easement area to reduce disturbance to wetland soils.

5.4.3 Mitigation

Specific effects during vegetation removal that may create temporary adverse environmental impacts include noise from equipment use; noise and dust from the transport of equipment and personnel to the site; and water quality impacts from erosion and spills. No mitigation is required, but minimization and avoidance techniques would be employed.

BMPs for vegetation removal include a variety of measures to minimize impacts. These include:

- Limits on hours of construction
- Requirements for engine mufflers on equipment to reduce noise
- SPPC Plan and on-site materials for spill containment and clean up
- Washing equipment before it leaves site
- Recycling of waste materials where appropriate
- Use of removed vegetation for firewood, wood chips and compost in lieu of disposing in a landfill
- Neighborhood and trail user notification of vegetation removal activity
- Vegetation removal during the non-nesting period
- Upon completion of vegetation removal, areas seeded with grass or grass-type vegetation to provide soil stabilization
- Federal and state recommended BMPs used for erosion control and water quality protection

5.5 Department of Transportation Act Section 4(f) Resources

5.5.1 Significance Criteria

FAA Order 1050.1F, Significance Threshold, indicates a significant impact would occur when the Sponsor's Preferred Alternative "involves more than a minimal physical use of a 4(f) property or constitutes a "constructive use" based on an FAA determination that an aviation project substantially impairing the 4(f) resource." "Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished."

5.5.2 Analysis

A review of maps of the local area shows one potential resource, a conservation easement area south of the Airport, on Port-owned land that includes a recreation trail granted under a separate easement. The purpose of the Lavender Hollow Wetland Conservation Easement is to preserve and maintain the natural elements and ecological and aesthetic value of the land by continuation of land use patterns. Wetlands within the conservation easement would not be disturbed by tree removal. San Juan County provided approval to remove trees within the conservation easement (see **Appendix B**). The FAA has determined that the Lavender Hollow Wetland Conservation Easement property is not a 4(f) resource; however, the trail is a 4(f) resource.

No Action Alternative

The No Action Alternative would not alter use of, or the experience of using, the path.

Preferred Alternative

Vegetation removal along the trail may require temporary closure of the trail for user safety; however, no permanent alteration or closure of the trail is planned. Maintenance of the trail in its present configuration, while removing the vegetation is not considered a direct use of the 4(f) resource, is allowed outright in the easement terms.

There is no feasible or prudent alternative to removal of the vegetation in order to protect the 20:1 visual approach surface. The Airport considered topping trees or cutting only trees that currently penetrate the approach surface; however, that would require frequent disruptions of the area, as trees would continue to grow.

Removal of the vegetation near the trail is also not a constructive use of the 4(f) property because the trail would remain in its existing location and would be surrounded with grass and grass-type vegetation. The actions proposed in order to maintain the 20:1 visual approach surface does not constitute a constructive use of a 4(f) property.

5.5.3 Mitigation

No mitigation is proposed beyond replanting the areas around the trail with grass after vegetation removal is complete. Notices would be posted for trail users well in advance, noting the dates and times of any planned closures to ensure public safety while work is being performed.

5.6 Federally-Listed Endangered and Threatened Species See Section 5.2.

5.7 Energy Supplies, Natural Resources, and Sustainable Design

5.7.1 Significance Criteria

FAA Order 1050.1F does not establish a significance threshold for Natural Resources and Energy Supply. The EA must consider if the Proposed Action has the "...potential to cause demand to exceed available or future supplies of these resources." For purposes of the EA, the Proposed Action will be examined to identify any proposed major changes in stationary facilities or the movement of aircraft and ground vehicles that would have a measurable effect on local supplies of energy or natural resources. If there are major changes, power companies or other suppliers of energy will be contacted to determine if projected demands can be met by existing or planned source facilities. The use of natural resources other than for fuel need be examined only if the action involves a need for unusual materials or those in short supply.

5.7.2 Analysis

The Airport's electricity is provided by Orcas Power and Light Cooperative. The Proposed Action would not affect demand for electricity at the Airport.

No Action Alternative

The No Action Alternative would not alter the current use of energy and natural resources at the Airport.

Preferred Alternative

Removal of vegetation would not increase demand for electricity or any construction materials or resources.

5.7.3 Mitigation

No mitigation measures are proposed since the Proposed Action does not involve a need for unusual materials or those in short supply.

5.8 Socioeconomics

5.8.1 Significance Criteria

FAA Order 1050.1F does not establish a significance threshold for socioeconomic impacts. The EA must consider whether the project would:

- "Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or
- Produce a substantial change in the community tax base."

Normally, socioeconomic impacts on public services would not be considered significant except where there are significant impacts in other categories such as land use. For purposes of analysis, an action is considered to have a significant impact on public services if construction of major new facilities, such as a permanent new school building or a community center, is required to accommodate the projected demand from the action.

5.8.2 Analysis

The Airport serves a variety of important economic and social functions for the Eastsound community, as well as the San Juan Islands. As an FAA-obligated Airport, the Port has a responsibility to maintain the Airport's consistency with FAA Part 77, 20:1 visual approach surface regulations.

No Action Alternative

There would be no change to the current conditions. The Port has identified obstructions in the FAR Part 77, 20:1 visual approach surface. If the Airport is not improved, these conditions would remain, and the Airport would not be in compliance or meet Part 77 regulations. Decreased runway length, along with increased approach minimums, would likely occur without obstruction removal.

Preferred Alternative

The Preferred Alternative would remove vegetation in the 20:1 visual approach to meet the FAR Part 77 regulations. Clearing obstructions by removing vegetation in the approach surface would improve aircraft operations and safety.

The proposed project does not create any off-Airport impacts. The Preferred Alternative does not relocate any residents or businesses, and there would be no road closures or detours. There would be no short- or long-term alteration of travel patterns. There would be no losses in the community tax base. Use of the

trail would be restricted during vegetation removal activities to protect user safety. Notices would be posted well in advance to advise users of temporary closure dates.

5.8.3 Mitigation

The project would not create any negative socioeconomics impacts; therefore, no mitigation is proposed.

5.9 Environmental Justice

5.9.1 Significance Criteria

Determining significance under NEPA is guided by FAA Order 1050.1F. The order does not establish a significance threshold for Environmental Justice. The EA must consider whether the proposed "action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to:

- Significant impacts in other environmental impact categories; or
- Impacts on the physical or natural environment that affect an environmental justice population in a
 way that the FAA determines are unique to the environmental justice population and significant to
 that population."

To determine whether an environmental justice population is present, Federal agencies must refer to U.S Census data to establish the demographic and socioeconomic baseline. If a Proposed Action causes disproportionately high and adverse human health or environmental effects on a minority- and low-income population, it would represent a significant impact associated with environmental justice.

5.9.2 Analysis

Within the project area and immediate vicinity, there are no concentrations of minority or low-income populations. A review of land use shows there are no specific concentrations of elderly (nursing home, retirement housing) in the Airport vicinity.

No Action Alternative

The No Action Alternative would not alter the Airport from its current configuration. There would be no change to the manner in which the Airport affects the surrounding community.

Preferred Alternative

No residential or business relocations would occur as part of the Preferred Alternative. Vegetation removal would not affect jobs. The Proposed Action creates minimal off-site impact. As there are no identified populations of ethnic minorities, low income or elderly persons, no disproportionate impacts would occur to one segment of the population.

5.9.3 Mitigation

No mitigation is proposed, as there would be no disproportionate impacts to one segment of the population.

5.10 Children's Health and Safety Risks

5.10.1 Significance Criteria

FAA Order 1050.1F does not establish a significance threshold for Children's Environmental Health and Safety Risks. The project must consider whether there is the potential disproportionate risk to the health and safety of children.

Environmental health and safety risks include those attributable to products or substances with which a child is likely to come into contact. Disproportionate health and safety risks to children that would result from a Proposed Action may represent a significant impact. For the purpose of this analysis, a significant impact to air quality, schools or public recreational facilities would be considered a significant risk to children's health and safety.

5.10.2 Analysis

The project would not alter the number of aircraft operations serving the Airport. Surface transportation emissions not related to vegetation removal would remain the same. Vegetation removal related air quality impacts would include the potential for airborne particulates as a result of exhaust from equipment. There are no schools or daycare facilities in the project area or Airport vicinity.

No Action Alternative

The No Action Alternative would not alter Airport operations or change its current configuration. There would be no change to the manner in which the Airport affects the surrounding community, and no impacts to children's health and safety.

Preferred Alternative

Clearing obstructions by removing vegetation in the approach surface would improve aircraft operations and safety. Recreational trail use would be restricted during vegetation removal activities to protect public safety. Vegetation removal related equipment emissions would not impact children's health and safety because there are no schools or daycare facilities in the project area. The proposed project does not create any adverse or disproportionate impacts to children's health and safety.

5.10.3 Mitigation

The project would not create any negative or disproportionate impacts children's health and safety; therefore, no mitigation is proposed.

5.11 Farmlands

5.11.1 Significance Criteria

FAA Order 1050.1F, Significance Threshold, states a significant impact occurs if "the total combined score on Form AD-1006, Farmland Conversion Impact Rating, ranges between 200 and 260 points." The project must consider if the Proposed Action would convert important farmland to non-agricultural use.

5.11.2 Analysis

In the vegetation removal area, Deadmanbay-Morancreek complex is considered prime farmland soil. Sholander-Speiden complex (unirrigated) is also present. There are no plans to irrigate this area. Vegetation removal would not preclude future use for farming, as long as it was consistent with FAA and local requirements to protect the Airport.

No Action Alternative

The No Action Alternative would not alter any use of soils that are considered prime or unique farmland.

Preferred Alternative

The proposed removal of vegetation would not remove the land from potential farm use. The Port proposes to re-seed the area in grass and maintain it as a mowed field. At some future time, if deemed compatible with Airport use, the area could be farmed.

There is no loss of potentially farmable land as a result of the Preferred Alternative.

5.11.3 Mitigation

No mitigation is proposed, as no prime or unique farmlands would be lost as a result of the Preferred Alternative.

5.12 Floodplains

5.12.1 Significance Criteria

FAA Order 1050.1F, Significance Threshold, states a significant impact occurs when the proposed "action would cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of USDOT Order 5650.2, Floodplain Management and Protection."

Agencies are required to make a finding that there is no practicable alternative before taking action that would encroach on a base floodplain based on a 100-year flood. If the agency finds that the only practicable alternative requires siting in the base floodplain, a floodplain encroachment would occur and further environmental analysis is needed.

The FAA shall, prior to taking the action, design or modify the Proposed Action to minimize potential harm to natural floodplain values or within the base floodplain. The action is to be consistent with regulations issued according to section 2(d) of E.O. 11988. The FAA shall also provide the public with an opportunity to review the encroachment through its public involvement process, and any public hearing presentations shall include identification of encroachment. FAA's analysis shall also indicate if the encroachment would be a "significant encroachment," that is, whether it would cause one or more of the following impacts.

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

5.12.2 Analysis

FEMA maps show the northern portion of the runway and parallel taxiway are in Flood Zone A – annual flooding. This area is protected by a tide gate and most flooding is related to tidal extremes. None of the area proposed for vegetation removal is within an identified flood zone.

No Action Alternative

The No Action Alternative would not alter a floodplain area or increase the risk of flooding.

Preferred Alternative

The Preferred Action Alternative would not affect the flood risk for the area south of Mt. Baker Road, as the area is not within the flood zone.

5.12.3 Mitigation

No mitigation is proposed.

5.13 Hazardous Materials

5.13.1 Significance Criteria

FAA Order 1050.1F does not establish a significance threshold for hazardous materials. According to FAA Order 1050.1F, the EA must consider whether the proposed "action would have the potential to:

- Violate applicable Federal, state, tribal, or local laws or regulations regarding hazardous materials...;
- Involve a contaminated site (including but not limited to a site listed on the National Priorities List)...;
- Produce an appreciably different quantity or type of hazardous waste...;
- Adversely affect human health and the environment."

5.13.2 Analysis

On-Airport, there is a 10,000 gallon underground fuel storage tank. The fuel service area has spill containment aprons. No development or dumping activities have been known to occur in the area south of the runway where vegetation removal is proposed.

No Action Alternative

The No Action Alternative would not increase the generation of potentially hazardous materials in the project area. The No Action Alternative would not increase the risk of finding previously contaminated areas on- or off-Airport property.

Preferred Alternative

Spills may occur when aircraft are damaged as a result of a collision or when an aircraft accidentally leaves the runway or taxiway surface. The removal of vegetation in the 20:1 visual approach area reduces the risk of an aircraft sustaining damage during a landing or take off.

5.13.3 Mitigation

If the contractor identifies any material or odors that could be of a hazardous nature, work would cease until the material can be identified and appropriately disposed of. No additional mitigation is proposed.

5.14 Historical, Architectural & Cultural Resources including Native American & Tribal Resources

5.14.1 Significance Criteria

FAA Order 1050.1F does not provide a significance threshold for historical, architectural, archaeological or cultural resources. According to FAA Order 1050.1F, the EA must consider whether the proposed "action would result in a finding of Adverse Effect through the Section 106 process."

The National Historic Preservation Act (NHPA) of I966, as amended, establishes the Advisory Council on Historic Preservation (ACHP) and the National Register of Historic Places (NRHP). Section 106 requires Federal agencies to consider the effects of their undertaking on properties on or eligible for inclusion in the NRHP. Compliance with section 106 requires consultation with the ACHP, the State Historic Preservation Officer (SHPO), and/or the Tribal Historic Preservation Officer (THPO) if there is a potential adverse effect to historic properties on or eligible for listing on the National Register of Historic Places.

The responsible FAA official determines whether the Proposed Action is an "undertaking," as defined in 36 CFR 800.16(y) (and not an undertaking that is merely subject to State or local regulation administered pursuant to a delegation or approval by a Federal agency), and whether it is a type of activity that has the potential to cause adverse effects on historic properties eligible for or listed on the NRHP. If an undertaking may have an adverse effect, the first step is to identify the area of potential effect (APE) and the historical or cultural resources within it.

If a NRHP-eligible property occurs within the undertaking's APE and the Proposed Action may affect the property's historic characteristics, the Responsible FAA Official must apply the criteria of effect listed in 36 CFR 800.5(a). The Official must examine the potential effects in consultation with the SHPO/THPO and any Tribe or Native Hawaiian organization attaching religious or cultural importance to the identified property. 36 CFR 800.5(a)(3) permits phased assessments of effects when alternatives the agency is considering involve corridors, large land areas, or when access to property is restricted. The FAA Official may propose a "finding of no adverse effect" after determining that the undertaking would not:

- physically destroy the property;
- alter the property, but, if alterations would occur, they meet the requirements of the Secretary of the Interior's "Standards for Treatment of Historic Properties" (36 CFR part 68);
- remove the property from its historic location;
- introduce an atmospheric, audible, or visual feature to the area that would diminish the integrity of the property's setting, provided the setting contributes to the property's historical significance; or,
- through transfer, sale, or lease, diminishes the long-term preservation of the property's historic significance that Federal ownership or control would otherwise ensure.

5.14.2 Analysis

The Cultural Resource Inventory conducted for this project (see **Appendix D**) shows low potential for any significant resources in the area proposed for vegetation removal.

The FAA consulted with the applicable tribes (Lummi, Samish, Upper Skagit, and Swinomish) and Washington State Department of Archaeology and Historic Preservation (DAHP).

No Action Alternative

Taking no action would have no effect on cultural, archaeological, architectural or historic resources.

Preferred Alternative

Based on consultation with the DAHP and Tribes included in **Appendix E**, the Preferred Alternative would have no effect on cultural, archaeological, architectural or historic resources. The FAA has determined the project may proceed in accordance with Section 106 regulations.

5.14.3 Mitigation

No mitigation is proposed. Per the Inadvertent Discovery Plan included in the Cultural Resources Report, recommendations would be implemented if any archaeological or historic materials are encountered. These guidelines are identified in the Vegetation Removal Impacts section of this chapter.

5.15 Light Emissions and Visual Effects

5.15.1 Significance Criteria

FAA Order 1050.1F does not establish significance threshold for light emissions or visual effects. According to FAA Order 1050.1F, the project must consider "the degree to which the action would have the potential to:

- Create annoyance or interfere with normal activities from light emissions; and
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.
- Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and/or visual character in the study area; and
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations."

Because of the relatively low levels of light intensity compared to background levels associated with most air navigation facilities and other Airport development actions, light emissions impacts are unlikely to have an adverse impact on human activity or the use or characteristics of the protected properties.

Visual quality impacts deal more broadly with the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable.

5.15.2 Analysis

There would be no changes to runway lighting or other on-airport lights. Vegetation removal in-line with the runway would create a different view of the approach area. Removal of trees within the conservation easement area would alter the view from the trail. The Airport beacon would remain in its present location and continue operation.

No Action Alternative

Taking no action would not alter the view or the amount of light generated by the Airport.

Preferred Alternative

The Preferred Alternative would remove vegetation in the area directly in-line with the runway. The area would be re-vegetated with grass or grass-like vegetation. Trees and tree species with the ability to grow into the 20:1 visual approach would be removed from the conservation easement area. The view of this area would change to an area of lower shrubs and understory vegetation. Views from the trail would include stumps and existing shrubby vegetation.

5.15.3 Mitigation

No mitigation is proposed.

5.16 Noise

5.16.1 Significance Criteria

FAA order 1050.1F, Significance Threshold, states a significant impact occurs when the "action would increase noise by DNL 1.5 decibels (dB) or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe." This is consistent with federal (FAA and U.S. Department of Housing and Urban Development land use compatibility guidelines and

federal noise attenuation grant funding eligibility criteria. FAA 1050.1F further states, "special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within Section 4(f) properties where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question."

5.16.2 Analysis

Noise modeling was not required for the Airport. Airport noise is primarily a function of runway location (including length) and size. Relocating a runway could move noise generation closer to sensitive users, while lengthening a runway can move noise generation and can allow larger and possibly louder aircraft. The Proposed Action would not alter the location of the runway, extending its length or in any other way moving it closer to sensitive uses. The Proposed Action would not add capacity to the Airport, create induced demand or contribute to an increase in noise.

No Action Alternative

No change to the current conditions would occur.

Preferred Alternative

The Preferred Alternative would not alter Airport-related noise from the current conditions because the runway is not being relocated or extended.

5.16.3 Mitigation

No mitigation is proposed, as there would be no significant noise impacts.

5.17 Solid Waste

5.17.1 Significance Criteria

FAA Order 1050.1F does not establish significance threshold for solid waste. The EA must consider if the project violates Federal, state, tribal, or local laws or regulations for solid waste management or generates an appreciably different quantity or type of solid waste, proposes a different method for collection and disposal, exceeds local capacity or adversely impacts human health or the environment. Generally, additional information or analysis is needed only if problems are anticipated with respect to meet local, state, Tribal or Federal laws and regulation on solid waste management.

5.17.2 Analysis

The Airport currently generates solid waste associated with the business of airport management. Materials may include paper, food waste and wrappings, and replaced aircraft parts. The Proposed Action would remove vegetation. Downed trees within the conservation easement and all vegetation in all other areas would be removed and taken off-site.

No Action Alternative

Solid waste generation under the No Action Alternative would increase at the rate of increasing use of the Airport.

Preferred Alternative

The Preferred Alternative would not effect on-airport waste generation. The removed vegetation can be used for compost, wood chips and firewood, and not taken to a landfill.

5.17.3 Mitigation

There are no significant impacts to solid waste generation at the Airport; therefore, no mitigation is proposed.

5.18 Water Quality

5.18.1 Significance Criteria

FAA Order 1050.1F, Significance Threshold, specifies a significant impact occurs when the project exceeds "water quality standards established by Federal, state, local, and tribal regulatory agencies; or contaminates public drinking water supply such that public health may be adversely affected." The EA must consider whether the Proposed Action has the potential to "adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values; adversely affect surface waters such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; and presents difficulties based on water quality impacts when obtaining a permit or authorization."

5.18.2 Analysis

Water quality is generally governed under the provisions of the Federal Water Pollution Control Act, as amended by the Clean Water Act and other amendments.

No Action Alternative

The No Action Alternative creates no long-term water quality impacts.

Preferred Alternative

The project would not alter the amount of impervious surface on the airport. It would not effect on-airport drainage. The Proposed Action would comply with all requirements for stormwater using erosion control measures. The Port would obtain authorization under the NPDES Construction General Permit and prepare a Stormwater Pollution Prevention Plan to control stormwater runoff.

5.18.3 Mitigation

No mitigation is proposed.

5.19 Wetlands

5.19.1 Significance Criteria

FAA Order 1050.1F, Significance Threshold, states that a significant impact would occur when a Proposed Action would "adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers; substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected; substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare; adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands; promote development of secondary activities or services that would cause the circumstances listed above to occur; or be inconsistent with applicable state wetland strategies."

5.19.2 Analysis

A delineation of wetlands and other waters at the project area was prepared after site visit on June 3, 2014. The delineation identified one wetland (Wetland D) and one ditched channel (Stream 3) in the project area. Detailed wetland information is presented in **Appendix C**.

No Action Alternative

Taking no action would allow the existing on-Airport wetland areas to remain undisturbed.

Preferred Alternative

Vegetation removal activity would not create a permanent loss of wetlands. Wetlands (Wetland D) would be disturbed by the use of equipment necessary to remove vegetation, but the area would be replanted with grass or grass-like vegetation immediately following the work. No filling or grading is proposed; therefore, no loss of hydrologic control functions are anticipated.

There is a ditch channel (Stream 3) through the southern area that connects to other downstream systems, there may be a concern with short- and long-term water quality impacts. Short-term impacts would be mitigated through the installation of erosion control measures. Long-term impacts would be mitigated by replanting of native grass or grass-like along the ditch immediately following the vegetation removal. Other prevention measures include clearing during the driest part of the year.

5.19.3 Mitigation

The proposed mitigation measures for the tree clearing in Wetland D would include:

- 1) Immediate restoration of any disturbed soils, if necessary, and then grass seeding.
- 2) Mowing shall be avoided within 25 feet of either side of the ditch to protect water quality functions.
- 3) Ongoing maintenance to control pioneer tree species would occur within the conservation easement. These mitigation measures would be reviewed and approved by the San Juan County.

5.20 Greenhouse Gases/Climate

5.20.1 Significance Criteria

Although there are no federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate⁷. FAA 1050.1F does not identify significance thresholds or specific factors to consider to make a significance determination. The CEQ has indicated that climate should be considered in NEPA analyses. As noted by CEQ, however, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand".⁸

5.20.2 Analysis

GHGs are currently produced as a result of aircraft operations at the Airport. The exact level of these emissions are unknown.

No Action Alternative

The GHG emissions at the Airport would continue at their current level.

Preferred Alternative

The vegetation removal project would have no impact to GHG emissions. The size of the aircraft that can utilize the Airport does not change as a result of the Proposed Action, nor would it increase the Airport's capacity or alter the type of demand currently exhibited.

⁷ See *Massachusetts v. EPA*, 549 U.S. 497, 508-10, 521-23 (2007).

⁸ Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions, CEQ (2010).

5.20.3 Mitigation

No mitigation is proposed, as the project would not change the level of GHG emissions.

5.21 Cumulative Impacts

5.21.1 Significance Criteria

Cumulative Impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period. Determining whether a Proposed Action will have a significant impact, the EA shall include considerations of whether the action is related to other actions with individually insignificant but cumulatively significant impacts. This analysis shall include identification and consideration of the cumulative impacts of ongoing, proposed and reasonably foreseeable future actions and may include information garnered from FAA, the Port and the NEPA process.

5.21.2 Analysis

The analysis considered the possible impacts of the Proposed Action and other development both on and off the Airport. The analysis identified if any of the following actions are planned to occur within the vicinity of the Proposed Action: development by local government or planning agencies, land development projects, other development or improvements at the Airport, roadway improvements and public infrastructure projects.

Past Projects (3-5 year timeframe)

The Airport apron was reconstructed in 2011. There have been no other projects on the Airport or adjacent to it in the past three to five years.

Present Projects

There is a current airport maintenance project, which includes maintaining the airfield pavements, drainage structures, fencing and gates, and weather reporting equipment.

Reasonably Foreseeable Projects (3-5 year horizon)

There are no known projects in the reasonably foreseeable future in the Airport vicinity. The Airport, at this time, has no plans for future projects, as the Port will be updating the Airport Master Plan.

5.21.3 Cumulative Impacts Summary

The Proposed Action has no off-site impacts. There are no known developments currently occurring or planned in the foreseeable future, and there are no significant impacts associated with the Proposed Action.

The Preferred Alternative, when combined with past, present and reasonably foreseeable future projects is not anticipated to create significant cumulative impacts.

Any new development outside of State-recognized thresholds would be required to undergo review under the Washington State Environmental Policy Act and comply with all State and Federal permitting processes.

5.22 Mitigation Summary

There are no direct or cumulative significant impacts anticipated as a result of the proposed project; therefore, no mitigation is proposed.

5.23 Public and Agency Involvement

The Port held a public scoping meeting on December 2013 to present the project and seek input. The meeting was advertised in the local newspaper. The meeting was minimally attended, and participants were all key users of the Airport. No concerns were raised about the proposed project.

The FAA initiated consultation with DAHP in accordance with Section 106 of the NHPA in March 2015 (**Appendix E**). DAHP concurred with the finding of no historic properties affected for the project (**Appendix D**).

The FAA also initiated consultation with the Lummi Nation, Samish Indian Nation, Swinomish Indian Tribal Community, and Upper Skagit Tribe in March 2015 in accordance with Section 106 of the NHPA, EO 13175 and FAA order 1210.20 (**Appendix E**). No comments were received regarding the proposed project.

The Airport coordinated with San Juan County regarding tree removal within the conservation easement (**Appendix B**). San Juan County agreed to tree cutting within the Port-owned area of the easement.



Technical Memorandum

To: Anthony Simpson, Port of Orcas

From: Valerie Thompson, WHPacific, Inc.

Date: July 5, 2016

Re: Orcas Airport Biological Evaluation Memorandum

Project Description

This Biological Evaluation Memorandum describes the results of a site assessment conducted for the Orcas Island Airport in anticipation of a proposed obstruction removal project. The purpose of this study is to evaluate the potential effects of the proposed project on biological resources listed under the Federal Endangered Species Act (ESA) and Washington State ESA.

The Orcas Island Airport (Airport) is located in San Juan County, Washington, approximately one mile from the Island's business center of Eastsound. San Juan County is in northwestern Washington and is comprised of four major islands and over 700 smaller ones. Orcas is the second most populated island with about 4,500 residents. The airport consists of one runway, one parallel taxiway, and associated airport structures. The proposed action is needed improve the visual approach surface to meet FAA design and safety standards. From a local perspective, the Proposed Action is needed to maintain the Airport as an essential public facility and economic resource for Orcas Island.

There are currently numerous obstructions to the Runway 34 Federal Aviation Regulation (FAR) Part 77 approach surface, as identified in a 2014 obstruction survey. To improve the most critical center portion of the 20:1 visual approach surface of Runway 34, vegetation removal is proposed to meet Federal Aviation Administration (FAA) design standards. The trees proposed for removal are hazardous because of their height and are growing into regulated airspace. Vegetation that is likely to penetrate the approach surface in the future will also be removed as part of this project.

The project is located to the south of the airport. The majority of the project will occur on Port-owned property and a small portion of privately-owned property. The study area consists of two distinct vegetative communities: an open grass field and a forested area. A wetland delineation was conducted for the study area (Wetland Resources 2014), which identified wetlands in both areas, and a stream in the forested area. A wetland conservation easement area and a pedestrian path are also located within the forested portion of the study area.

The project includes full vegetation removal (all trees and shrubs, including stumps) within the approach surface, excluding the wetland conservation easement area. Within the wetland conservation easement area, all trees currently penetrating or with the potential to penetrate the center portion of approach surface will be removed. Tree stumps and undergrowth will be left in place to minimize ground and wetland disturbance and impacts. The use of heavy equipment, trucks, chippers and chain saws would be necessary to complete vegetation removal.

Methods and Results

WHPacific staff completed a pedestrian survey of the study area on June 10, 2014. Photos of the study are shown in Appendix A. Plant species and communities, and observed bird species were recorded. The U.S. Fish and Wildlife Service (USFWS) species list for San Juan County, and Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS), and National Marine Fisheries Service (NMFS) Essential Fish Habitat (EFH) databases were reviewed prior to field investigations to identify sensitive resources for the study area and the surrounding waters of Puget Sound. Two distinct vegetative communities were investigated within the study area: a periodically maintained grass field and an adjacent forested area.

The open grass field, located along the western portion of the study area, contains wetlands and is dominated by soft rush (*Juncus effusus*), taper-tip rush (*Juncus acuminatus*), redtop bentgrass (*Agrostis gigantia*), velvetgrass (*Holcus lanatus*), meadow foxtail (*Alopecurus pratensis*), tall fescue (*Festuca arundinacea*), and slough sedge (*Carex obnupta*). The general topography is hummocky, and at the time of investigation, surface saturation was present at low points throughout the field with standing water up to one inch in a few places.

The eastern portion of the study area is forested and contains wetlands a ditched channel and a pedestrian trail. This forested area is the site of proposed obstruction removal. Vegetation here is dominated by willow (Salix spp.), red alder (Alnus rubra), Douglas fir (Pseudotsuga menziesii), with an understory of English hawthorn (Crataegus laevigata), Himalayan blackberry (Rubus armeniacus), and multiple rose species (Rosa spp.). The eastern portion of the forested area is a densely planted stand of Douglas fir with little understory or light penetration. A ditched channel runs through the forested portion of the site and appears to have been intentionally created several decades ago to control and convey the hydrology within the wetland for agricultural use. The ditched channel conveys natural hydrology, so it is classified as a stream.

No avian nesting behaviors were observed in the study area at the time of investigation. However, the dense forest and understory made it difficult to see in some places; and nesting by common avian species protected by the Migratory Bird Treaty Act (MBTA) would be expected in a forested stand such as this one. Avian species observed using the proposed study area included Swainson's thrush (*Catharus ustulatus*), Cedar waxwing (*Bombycilla cedrorum*), American robin (*Turdus migratorius*), and other common passerines. None of the observed avian species are listed under the Federal or state ESA, but most are protected by MBTA.

The USFWS and WDFW Threatened and Endangered Species databases were reviewed prior to field investigations. Appendix B includes Federal and state listed species for San Juan County including nearby waters of the Puget Sound with listing status and general habitat requirements. Critical and priority habitats associated with the project were also researched using online databases for USFWS, WDFW, and NMFS and San Juan County's 2014 Critical Area Ordinance, and the results are included in Appendix B. None of the listed species in Appendix B were observed during field investigations, and suitable habitat for these species does not exist within the study area.

The NMFS EFH database was reviewed prior to field investigations to determine the presence of EFH within the study area. Listed salmonids are not present within the study area, but are present in the waters

of Puget Sound including Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*, Threatened), Hood Canal summer chum salmon (*Oncorhynchus keta*, Threatened), Puget Sound steelhead (*Oncorhynchus mykiss*, Threatened), and coastal/Puget Sound bull trout (*Salvelinus confluentus*, Threatened). No EFH exists within the study area; however, EFH is present within Puget Sound for Chinook salmon, coho salmon (*Oncorhynchus kisutch*), and Puget Sound pink salmon (*Oncorhynchus gorbuscha*).

The WDFW PHS database search results show palustrine habitat covering most of the area of proposed obstruction removal. Nearby, but outside of the study area, saltwater environs off of the north end of the airport contain Marine Intertidal Aquatic Habitat, and pinto abalone (*Haliotis kamtschatkana*). A Bald eagle (*Haliaeetus leucocephalus*) breeding area, and wetland and palustrine areas are noted within a quarter mile to the west of the north end of the runway. In the waters of Fishing Bay, a half mile to the south of the project area, the PHS database also noted Wetlands, Estuarine and Marine Wetlands as aquatic habitats; a Pacific herring (*Clupea pallasi*) breeding area, and pinto abalone are also present.

Consequences

As designed, the proposed project is expected to have no effect on Federal- or state-listed species. No Federal-listed T&E species were found in the study area during field investigations. Further, they are unlikely to be within the study area based on available habitat. There is no designated Critical Habitat or EFH within the study area.

Avian species observed during the site investigation, or anticipated to be in the study area, are not Federal- or state-listed, but are protected under MBTA. Vegetation removal will occur outside of the nesting season and during the dry season to avoid potential disturbance of nesting birds and minimize ground disturbance.

Stormwater management would be used control erosion and prevent runoff from discharging to local waters. The areas would be seeded with grass after vegetation removal. Vegetation removal would be conducted in accordance with FAA Advisory Circular 150/5370-10A, Standards for Specifying Construction of Airports, Item P156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control (FAA, 1991). Erosion control would comply with the San Juan County and the Washington State Department of Ecology requirements, follow best management practices and comply with all requirements for stormwater.

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Appendix A: Photos (June 10, 2014)



Photo 1: Western portion of study area. Looking northeast toward obstruction removal area.



Photo 2: Emergent wetland within forested area. Willow spp., English hawthorn, Himalayan blackberry, slough sedge.



Photo 3: Southern end of study area, looking south.



Photo 4: Pedestrian path with densely-planted Douglas fir.



Photo 5: English hawthorn, Himalayan blackberry in understory near pedestrian path.

Appendix B: Federal and State Protected Species in San Juan County, Washington:

Table 1: Washington State and Federal Threatened and Endangered Non-Fish Species in San Juan County*

Species		WA State Status	Federal Status	Habitat Requirements and Occurrence in San Juan County	
Taylor's checkerspot (butterfly)	Euphydryas editha taylori	Endangered	Endangered	Dry prairies or prairie-like native grassland with host plant species. Historic range includes the San Juan Islands but there are no known populations currently on the islands (WDFW 2013).	
Brown pelican	Pelicanus occidentalis	Endangered	Species of Concern Not common in San Juan county. Use marine and near shore has used as resting sites including islands, off shore rocks, breakwaters, sand spits, and sandbars (Herrea and the Water Company 2011). Brown pelicans have additional required protes under the San Juan County Critical Area Ordinance (2014).		
Marbled murrelet	Brachyramphus marmoratus	Threatened	Threatened	Inhabit shallow coastal areas where they primarily feed on near shot forage fish. Travel inland to nest in mature and old growth forest, most building nests on large branches or other suitable platforms in large trees (WDFW 2013). Marbled murrelets use the marine waters arour the San Juan Islands year round with higher numbers being found in the winter (Adamus 2011). There is no confirmed nesting of marble murrelets in the San Juan Islands but potential breeding habitat matexists (Adamus 2011). Have additional required protections under the San Juan County Critical Area Ordinance (2014).	
Humpback Whale	Megatera novaeangliae	Endangered	Endangered	Usually occur off of Washington State from July to September. One common (early 1900's) but now rare visitors to the inner marine wate of Washington and British Columbia (WDFW 2013). Have require protections under the San Juan County Critical Area Ordinance (2014)	
Killer Whale (Orca)	Orcinus orca	Endangered (all populations)	Endangered (southern resident population)	throughout Puget Sound, including around the San Juan Islands (NC 2014). Have additional required protections under the Marine Mami	
Sea Otter	Enhydra lutris	Endangered	Species of Concern	At present sea otter populations occur in rocky habitats along the west coast of the Olympic Peninsula (WDFW 2013). Have required protections in the San Juan County Critical Area Ordinance (2014).	
Steller sea lion	Eumetopias Jubatus	Threatened	Species of Concern	Use jetties, offshore rocks, coastal islands, and navigation buoys haulout sites. Present in the San Juan Islands. Pupping areas Washington State are along the outer Washington coast (WDFW 2013 Have required protections under the Marine Mammal Act and the Sa Juan County Critical Area Ordinance (2014).	
Western pond Turtle	Actinemys marmorata	Endangered	Species of Concern	Lives in slow moving streams, lakes, ponds, and wetlands (WDFW 2013). Not listed as present in San Juan County (WDFW 2008). The San Juan Islands are included in the Western pond turtle Puget Sound/Puget Trough recovery zone (Hays et al. 1999). Have additional protections under the San Juan County Critical Area Ordinance (2014).	
Green sea turtle	Chelonia mydas	Threatened	Threatened	Pelagic animals usually found in tropical and subtropical waters near islands and continents. Rarely recorded in Washington State (WDFW 2013).	
Leatherback sea turtle	Dermochelys coriacea	Endangered	Endangered	Pelagic animals that nest in the tropics and feed primarily on jelly fish. They can be found off the coast of WA in the summer and fall, including area around the San Juan Islands (WDFW 2013).	
Loggerhead sea turtle	Caretta	Threatened	Endangered	Pelagic animals that feed mostly on benthic invertebrates and are found throughout in tropical and temperate ocean regions worldwide. They are rarely recorded in Washington State (WDFW 2013).	

Adder's- tongue	Ophioglossum pusilum	Threatened	BLM sensitive, USFS sensitive	Seasonally wet areas in pastures, old fields, roadside ditches, bogs, fens, wet meadows, flood plains, moist woods, grassy swales, dry or damp sand, dry hillsides, and in seasonally wet acidic soil. Rare plant present in San Juan County (WNHP 2014).
Bog twayblade	Liparis loeselii	Endangered	BLM strategic, USFS strategic	Only two known occurrences in WA and one (San Juan Co. population) may be extinct. Both Washington State populations found in boggy wetlands (WNHP 2014).
California buttercup	Rannunculus californicus var. californicus	Threatened	BLM sensitive	Coastal bluffs, open grasslands, rocky slopes along the shore, and rocky wooded areas. Usually in dry grassland areas but also found in moister sites. Only 5 recent populations known in Washington State. (WNHP 2014).
Erect pygmy- weed	Crassula connata	Threatened	BLM strategic	Washington State populations found on seasonally wet cliffs, rock outcrops, and steep slopes. Rare plant present in San Juan County. (WNHP 2014).
Golden paintbrush	Castilleja levisecta	Endangered	Threatened	Primarily found in open grasslands and prairies generally with glacial outwash or depositional soils (WNHP 2014). Does not tolerate closed canopy. It is known to occur in San Juan County (USFW 2014).
Rosy owl- clover	Orthocarpus bracteosus	Endangered	BLM sensitive, USFS sensitive	Open areas in moist meadows in the transition zone between wetland and upland. Historically found on San Juan Island but populations have not been relocated. (WNHP 2014).
Rush aster	Symphyotrichum boreale	Threatened	BLM strategic	Lakesides, marshes, bogs, and fens (including calcareous bogs and fens), open peatland, and sedge-dominated open sphagnum bogs, at elevations from 250 to 2500 feet. Rare plant present in San Juan County. (WNHP 2014).
Sharpfruited peppergrass	Lepidium oxycarpum	Endangered	BLM strategic	Only one documented occurrence in WA (San Juan Co.). Grows within salt spray zone in moist cracks and vernal pools on bedrock, sandy, or dark saline soil in full sun (WNHP 2014).
Water lobelia	Lobelia dortmanna	Threatened	BLM strategic, USFS strategic	Submerged aquatic habitats in lakes and ponds. Grows on hard, firm sandy or gravel sediment (WDOE 2014). Rare plant present in San Juan County. (WNHP 2014).
White meconella	Meconella oregana	Endangered	Species of Concern	Open grassland on gradual to 100% slopes, at elevations of 60 to 620 feet. Sometimes found in a mix of forest and grassland Rare plant present in San Juan County. (WNHP 2014).

^{*} San Juan County listed species compiled from WDFW Priority Habitat and Species List (WDFW 2008), Washington Natural Heritage Program's list of known occurrences of rare plants in San Juan County (WNHP 2014), and San Juan County's 2014 Critical Area Ordinance section 18.30.160 fish and wildlife habitat conservation areas (FWHCAs).

Table 2: Listed Fish and Shellfish in San Juan County *

Spe	cies	WA State Status	Federal Status	Notes
Bull trout/Dolly Varden	Salvelinus confluentus/S. malma	Candidate	Threatened	(USFWS 2014)
Chinook - Puget Sound ESU ²	Oncorhynchus tshawytscha	Candidate	Threatened	(NOAA 2014) Have additional required protections San Juan County Critical Area Ordinance (2014).
Chum - Hood Canal summer run ESU ²	Oncorhynchus keta	Candidate	Threatened	(NOAA 2014) Have additional required protections San Juan County Critical Area Ordinance (2014).
Ozette Lake Sockeye	Oncorhynchus nerka	Candidate	Threatened	(NOAA 2014)
Steelhead - Puget Sound ESU ²	Oncorhynchus mykiss	Candidate	Threatened	(NOAA 2014) Have additional required protections San Juan County Critical Area Ordinance (2014).
Bocaccio- Georgia Basin DPS ¹	Sebastes paucispinis	Candidate	Endangered	Have additional required protections San Juan County Critical Area Ordinance (2014).
Canary rockfish – Georgia Basin DPS ¹	Sebastes pinniger	Candidate	Threatened	Have additional required protections San Juan County Critical Area Ordinance (2014).
Yelloweye rockfish – Georgia Basin DPS ¹	Sebastes ruberrimus	Candidate	Threatened	Have additional required protections San Juan County Critical Area Ordinance (2014).
Pinto (Northern) Abalone	Haliotis kamtschatkana	Candidate	Species of Concern	WDFW 2014, NOAA 2014

^{*}San Juan County listed fish species list compiled from NOAA Fisheries, West Coast Region, and Status of ESA Listings & Critical Habitat Designations for West Coast Salmon & Steelhead Map, WDFW Priority Habitat and Species List (WDFW 2008), and San Juan County's 2014 Critical Area Ordinance section 18.30.160 fish and wildlife habitat conservation areas (FWHCAs).

¹ Distinct Population Segment (DPS)

² Evolutionary Significance Unit (ESU)

Table 3: Species not included above with additional habitat protection requirements outlined in San Juan County Critical Area Ordinance section 18.30.160 fish and wildlife habitat conservation areas (FWHCAs) (San Juan County 2014).

	20.001200 1.011 0	WA		Total of areas (FWHEAS) (Sair Saari County 2014).	
		State Federal			
Species		Status	Status	Species Information and/or Required FWHCAs Protections	
Island marble butterfly	Euchloe ausonides insulanus	Candidate	Species of Concern	Sub-species of marble butterfly re-discovered in 1998. Small population found in coastal grasslands and prairies on San Juan and Lopez Islands. Uplants in the mustard family as host plants (WDFW 2013).	
Great arctic butterfly	Oeneis nevadensis gigas	Candidate	None	Non-migratory butterfly species found on the southern end of Vancouver Island, British Columbia, Canada. Listed as potentially occurring in San Juan County but there are no known populations currently in Washington State (NatureServe 2014).	
Sand verbena moth	Copablepharon fuscum	Candidate	None	Restricted to habitats along beaches, sand dunes, and spits that have dense populations of its host plant yellow-sand verbena (<i>Abronia latifolia</i>) (NatureServe 2014).	
Valley silverspot butterfly	Speyeria zerene bremnerii	Candidate	Species of Concern	Windy peaks with nearby forest openings, native prairies and grasslands. Found in the San Juan Islands. (Xerces 2014).	
Bald eagle	Haliaeetus lucocephalus	Sensitive	Species of Concern	Protected under the federal Bald and Golden Eagle Protection.	
Black oystercatcher	Haematopus bachmani	None	None	Rocky coastal shorelines. Breeding habitat associated with inter-tidal zon high tide margin and includes sand and gravel beaches, cobble and grave beaches, exposed rocky headlands, rocky islets, and tidewater glacia moraines (NatureServe 2014). Occur at low densities across range and have breeding sites in San Juan County (Golumbia et al. 2009).	
Golden eagle	Aquila chrysaetos	Candidate	None	Rare in Western Washington but are known to live year round in the Sar Juan Islands (Seattle Audubon 2014). Protected by the federal Bald and Golden Eagle Protection Act.	
Common Loon	Gavia immer	Sensitive	None	Wintering, migrating, and non-breeding populations occur around the Sal Juan Islands. Most common in shallow, clear, sheltered waters close to shore. There are no recent breeding records in San Juan County. (Adamu 2011). Have required buffer zones and other protections when present.	
Great Blue Heron	Ardea herodias	None	None	Foraging habitats include freshwater and brackish marshes, along lakes bays, lagoons, ocean beaches, mangroves, fields, and meadows. Nest commonly in tall trees in swamps and forested areas but have been known to nest in bushes or on the ground. (NatureServe 2014). Found on Orcas Island (Adamus 2011). Required ¼ mile buffer zones around nesting areas.	
Northern Harrier	Circus cyaneus	None	None	Grasslands, farmlands, parks, and steppe (Seattle Audubon). Required buffer zones around nesting and feeding areas.	
Peregrine falcon	Falco peregrimus	Sensitive	Species of Concern	Have required buffer zone and other protections when present. Recommendations include avoiding the use of lead shoot, pesticides and insecticides near nesting and feeding areas.	
Short-eared owl	Asio flammeus	None	None	Broad expanses of open land with low vegetation including fresh and saltwater marshes, bogs, dunes, prairies, and grasslands for feeding and nesting (NatureServe 2014). Not known to occur on Orcas Island but island has preferred habitat (Adamus 2011). Required buffer zone around nesting and feeding areas.	
Wilson's Snipe	Gallinago delicata	None	None	Breed in lowland, freshwater marshes and wet meadows with emergent vegetation (especially sedge meadows). During migration and winter, snipes can also be found in salt marshes, estuaries, and other mucky areas (Seattle Audubon Birdweb). Known to occur on Orcas Island (Adamus 2011). Required buffer zones around nesting and feeding areas.	
Northern flying squirrel	Glaucomy sabrinus	None	None	Coniferous and mixed forest, deciduous woods, and riparian woodlands. Prefer cool, moist mature forests with snags and downed logs near surface water (NatureServe 2014). Found on San Juan Island, probable presence on Orcas Island based upon habitat preferences (Adamus 2011).	

Townsend's big-eared bat	Corynorhinus townsendii	Candidate	Species of concern	Dry to moist forests, riparian, and open field habitats. Day roosts include caves, lava tubes, mines, old buildings, bridges, and concrete bunkers Hibernacula include caves, mines, lava tubes, and occasionally buildings Maternity colonies have been found in San Juan County (WDFW 2013).	
All bat species				FWHCA protection for areas with high concentrations of roosting bats.	
Gray Whale	Eschrichtius robustus	Sensitive	None	Coastal marine species that feed on the sea bottom in shallow waters. A few visit the inner marine waters of Washington State each year from around January through summer (WDFW 2013).	
Sharp-tailed snake	Contia tenuis	Candidate	Species of Concern	Generally found under logs, rocks, fallen branches or other cover in pastures, meadows, oak woodlands, chaparral, and edges or coniferous or hardwood forests (NatureServe 2014). Found on Orcas Island (Adamus 2011).	
Western Toad	Anaxyrus boreas	Candidate	Species of Concern	Required buffer zones when species is present. Recommendations include minimizing soil-disturbing activities, the preventing the pollution of runoff, and retaining rocks and down wood.	
Alaska alkaligrass	Puccinellia nutkaensis	WNHP watch list	USFW strategic	Salt marshes, rock outcrops and crevices receiving salt spray, mud flats and gravelly areas near the beach (WNHP2014). Added to WNHP's watch list since species is more abundant and/or less threatened in Washington than previously assumed (WNHP 2014).	
Arctic aster	Eurybia merita	State Sensitive	USFS sensitive	Open rocky places, rock crevices, alpine lithosols, and unstable talus slope mostly at high elevations in the mountains (WNHP 2014).	
Blunt-leaf pondweed	Potamogeton obtusifolius	Sensitive	BLM strategic	Submerged on banks of lakes, sloughs, and slow-moving streams in 3 to 9 feet of water. Rare in Washington State (WNHP 2014).	
Brittle prickly pear cactus	Opuntia fragilis	WNHP watch list	None	Sandy slopes, rocky outcrops, rocky knobs, and talus slopes in dry well dra soil from 14 to 4500 feet. Found in San Juan County. (WNHP <i>Opuntia fragil</i> website). Added to WNHP's watch list since species is more abundant and/o less threatened in Washington than previously assumed (WNHP 2014).	
Coast microseris	Microseris bigelovii	Possibly Extirpated		Grasslands on old dunes, glacial deposits, in small crevices, and on rock, 6 to 10 feet above the high tide line, usually in very little soil. Historically found in San Juan County, may be extinct in Washington State (WNHP 2014).	
Few-flowered sedge	Carex pauciflora	Sensitive	BLM sensitive, USFS sensitive	Wet acidic environments including sphagnum bogs and acidic peat a elevations of 250 to 4550 feet (WNHP 2014).	
Nuttall's quillwort	Isoetes nuttallii	Sensitive	BLM sensitive, USFS sensitive	Seasonally wet ground, seepages, temporary streams, and mud near verna pool at elevations from 200 to 345 feet (WHNP 2014).	
Slender crazyweed	Oxytropis campestris	Sensitive	BLM sensitive	Prairies, alpine meadows, open woodlands, and gravelly flood plains, moist or dry soils, at elevations from 1870 to 7600 feet (WNHP 2014).	
White top aster	Sericocarpus rigidus	Sensitive	Species of Concern	Usually on gravelly, glacial outwash soils in relatively flat, open lowland grasslands at elevations of 30 to 550 feet (WNHP 2014).	





SAN JUAN COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT

135 Rhone Street, PO Box 947, Friday Harbor, WA 98250 (360) 378-2354 | (360) 378-2116 dcd@sanjuanco.com | www.sanjuanco.com

Anthony Simpson Orcas Airport Manager PO Box 53 Eastsound, WA 98245

July 8, 2016

Re: Tree removal in conservation easement area

Dear Tony,

San Juan County Auditor's File Number 90168783 is a Lavender Hollow Wetland Conservation Easement that was recorded September 13, 1990 between Lavender Hollow Associates and San Juan County. Approximately half of this easement burdens property owned by the Port of Orcas and is within the 20:1 Part 77 Approach Surface.

The attached aerial photo from 1991 shows there were significantly fewer trees in the easement area than exist today. The Conservation Easement states in the fifth "whereas" that the "Grantor and Grantee County desire and intend that the natural elements and the ecological and aesthetic values of Grantor's land be preserved and maintained by the continuation of the patterns of land use on the Grantor's land that will not interfere with or substantially disrupt the natural elements or the workings of the natural systems."

On page two of the conservation easement, #2 states "The right of the Grantee, in a reasonable manner and at reasonable times, to enforce proceedings at law or in equity, the covenants hereinafter set forth, including but not limited to, the right to require the restoration of the protected easement area to the condition at the time of this grant. The Grantee, or its successors or assigns, does not waive or forfeit the right to take action as may be necessary to ensure compliance with the covenants and purposes of this grant by any prior failure to act."

Tree cutting in the Port-owned area of the conservation easement will be allowed. It will require environmental review under the State Environmental Policy Act for the entire area trees are to be removed, a wetland report prepared by a qualified wetland specialist showing how this project will not cause adverse impacts to the functions and values of the wetland, and if mitigation is necessary, a mitigation plan.

Please feel free to contact me if you have further questions. I can be reached at 370 7571 or by email at terikas@sanjuanco.com.

Sincerely.

Frika Shook, Directo





9505 19th Avenue S.E. Suite 106 Everett, Washington 98208 (425) 337-3174 Fax (425) 337-3045

COMPENSATORY WETLAND MITIGATION PLAN

FOR

ORCAS ISLAND AIRPORT 2016 RUNWAY AND TAXIWAY IMPROVEMENTS

Wetland Resources, Inc. Project #12225

Prepared By:

Wetland Resources, Inc. 9505 19th Ave. SE Suite 106 Everett, WA 98208 (425) 337-3174

For:
Port of Orcas
c/o WH Pacific
Attn: Flannan Tam
12100 NE 195th St., #300
Bothell, WA 98011

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Attachments

APPENDIX A: FIGURES, PHOTOS AND CHARTS

- Existing Conditions Map Airport Site (Figure 1)
- Existing Conditions Map South Site (Figure 2)
- Conceptual Mitigation Plan (Figure 3)
- Photo Plates 1 and 2
- WH Pacific Exhibit 3 Potential Wetland Impacts (1/4 4/4)
- Selecting Wetland Mitigation Sites Using A Watershed Approach Chart 3 Q&A
- Watershed Approach Chart 2
- Watershed Approach Chart 3
- Watershed Approach Chart 10

APPENDIX B: DELINEATION REPORT

Responsible Parties

Project Name:	Orcas Island Airport 2016 Runway and Taxiway			
	Improvements			
State:	Washington			
County:	San Juan County			
Location:	Portion of Section 11, Township 37N, Range 2W, W.M. Latitude: 48.709647, Longitude: -122.911606			
Project Proponent:	Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195 th St., #300 Bothell, WA 98011			
Proponent Contact:	Flannan Tam (425) 951-4872			
Preparer:	Wetland Resources, Inc. 9505 19th Ave. SE, Suite 106 Everett, WA 98208			
Preparer Contact:	Andrea Bachman Senior Wetland Ecologist (425) 337-3174			

Executive Summary

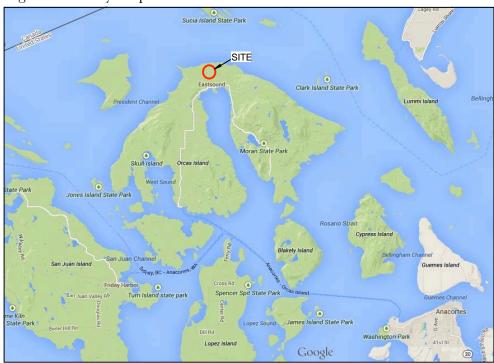
This project is on Orcas Island in the jurisdiction of San Juan County within portions of Sections 11 and 14, Township 37N, Range 2W, W.M. The project includes the following tax parcel numbers: 271412010000, 271412009000, 271412013000, 27114202300, and 271131001000. The Airport facility and adjacent mitigation area covers approximately 40 acres and is located at 147 Schoen Lane and is herein referred to as the "Airport Site". The site south of the airport covers almost 12 acres and is herein referred to as the "South Site". The South Site has no address, but is bordered to the north by Mt. Baker Rd. and to the west by Lover's Ln., and can be accessed from either road. This site is designated within the Water Resources Inventory Area (WRIA) 2.

The Port of Orcas, herein referred to as the Port, is proposing an expansion of the Orcas Island Airport facility in order to improve airport safety and comply with FAA requirements. This will include shifting the taxiway to the east, re-grading the runway and taxiway profiles, improving stormwater conveyance system on the site, and cutting trees underneath the flight path within the Port-owned property south of the Airport. Due to the proximity of the wetlands on the site, the project will result in permanent impacts to .06 acres of Wetland A (Category I), 0.8 acres of Wetland B (Category III) and 1.5 acres of Wetland C (Category IV).

The mitigation project will be required to meet both San Juan County and Department of Ecology/Corps of Engineers requirements. For this project, the applicant will propose a combination of wetland creation and wetland enhancement. This is intended to meet the minimum requirements of both San Juan County and DOE. Proposed mitigation measures will include wetland creation at a 4:1 ratio for Wetland A, a 1:1 ratio and wetland enhancement at a 4:1 ratio for Wetland B impacts; and wetland creation at a 1:1 ratio and enhancement at a 2:1 ratio for Wetland C impacts. The result will be a total of 2.54 acres of wetland creation and 6.2 acres of wetland enhancement.

The goal of this mitigation plan is to replace the functions and values lost from permanently impacting wetland areas and improving habitat functions. This plan includes provisions for maintenance and monitoring of the mitigation areas for a ten-year period or until the project is deemed successful.

Regional Vicinity Map



Local Vicinity Map



1.0 PROJECT DESCRIPTION

The Port of Orcas, herein referred to as the Port, is proposing improvements of the Orcas Island Airport facility in order to improve safety and comply with FAA requirements. This will include shifting the taxiway to the east, re-grading the runway and taxiway profiles, improving stormwater conveyance system on the site, installing navigational aids and cutting trees underneath the flight path within the Port-owned property south of the Airport.

This project is on Orcas Island in the jurisdiction of San Juan County within portions of Sections 11 and 14, Township 37N, Range 2W, W.M. The project includes the following tax parcel numbers: 271412010000, 271412009000, 271412013000, 27114202300, and 271131001000. The Airport facility and adjacent mitigation area covers approximately 40 acres and is located at 147 Schoen Lane and is herein referred to as the "Airport Site". The site south of the airport covers almost 12 acres and is herein referred to as the "South Site". The South Site has no address, but is bordered to the north by Mt. Baker Rd. and to the west by Lover's Ln., and can be accessed from either road.

Wetland Resources, Inc. (WRI) conducted several site visits, first to evaluate and verify previously delineated wetland boundaries in and around the tarmac of the Airport and proposed mitigation site, and then to conduct a wetland delineation on the property south of the Airport. The site visits were on November 7 and 8, 2012 and June 3, 2014.

WRI identified four wetlands and three ditched stream channels on the site. The identified wetlands on the site are labeled as Wetlands A, B, C, and D and the streams are labeled as Streams 1, 2, and 3. The on-site portions of Wetlands B and C are currently functioning as drainage swales. These wetlands function to store and convey much of the runoff from adjacent impervious surfaces.

Due to the proximity of the wetlands and streams on the site, the project will result in permanent impacts to .06 acres of Wetland A (Category I), 0.8 acres of Wetland B (Category III), and 1.5 acres of Wetland C (Category IV).

Additional details about the project are described below:

a) Separation Distance between Runway and Taxiway

Taxiway A is to be relocated approximately seven feet to the east from its current location to maintain a runway-to-taxiway separation of 156'. This relocation is required to satisfy the FAA separation standard between the runway and the taxiway. The taxiway width will remain at 25' wide.

b) Runways and Taxiway Centerline Profile

About two thirds of the existing parallel taxiway is higher than the crown of the runway. The elevation difference is almost two feet in some areas near Taxiway A2. The current FAA design Advisory Circular (AC) specifies that the crown of the taxiway should be no higher in elevation than the crown of the adjacent runway.

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To comply with the FAA standards, parts of the runway are raised, while parts of the taxiway are lowered where feasible to minimize the grading footprint. The runway length (2,900') and width (60') will remain the same. Due to the limitations of the design grades as described below, the grading limits extend past the wetland boundary. A portion of the wetland on both sides of the runway will be impacted as a result.

c) Runway Stopway Profile

The Runway 16 and 34 stopways are currently higher than the runway ends. The design AC indicates that the first 200 feet beyond the runway ends shall not be higher than the runway end elevations. To comply with the FAA requirements, the first 200 feet on the extended runway centerline is kept at the same elevation as the runway ends. Grading the Runway 34 safety area will impact the wetland located to the west of the runway.

d) Runway and Taxiway Transverse Grades

The design AC contains transverse slopes requirements for shoulder areas adjacent to the airfield pavement.

e) Drainage Improvements

This project proposes upgrading the current stormwater conveyance system of in-field swales through the installation of a new system of pipes and catch basins. The proposed work will require excavation, grading, and backfill along the piping areas and around the drainage structures.

f) Tree Removal in the South Site

FAA safety standards require all potential obstructions, such as trees and shrubs, to be removed from the approach surface within the area of the flight path. Therefore, as part of the airport improvements described above, the Port is proposing to remove existing tree and shrub canopies within the Port-owned South Site, which is part of the approach surface to the airport runway. The South Site includes a recorded conservation easement (doc #90168783), which is currently being managed by the County. The proposed vegetation clearing will occur within areas designated as wetlands and buffers within the approach surface.

In the areas outside of the conservation easement, tree stumps will be removed to allow for ease of maintenance throughout the site and to ensure no regrowth. Stumps within the conservation easement will be retained to minimize disturbances to the greatest extent possible.

1.1 PROJECT LOCATION

The site is located at 147 Schoen Lane on Orcas Island in San Juan County (portion of Section 11 and 14, Township 37N, Range 2W, W.M.). This site is designated within the Water Resources Inventory Area (WRIA) 2.

1.2 Type of Development

The Port of Orcas (applicant) is proposing improvements on the Orcas Island Airport facility in order to improve safety and comply with FAA requirements.

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1.3 SIZE OF THE PROJECT

The total project area, including areas and mitigation areas, amounts to approximately 52 acres.

1.4 CONSTRUCTION SCHEDULE

Construction is expected to begin in June 2016, upon receipt of all applicable permits.

2.0 DESCRIPTION OF THE DEVELOPMENT SITE (BASELINE CONDITIONS)

The majority of the Airport Site gently slopes to the north. The only noticeable variation in the surface topography is within the wetland swales. Surrounding land use is comprised of: the Airport, related commercial enterprises, single-family, and a small marina. The investigation area is defined by the vegetated areas between and adjacent to the tarmac. Vegetation is dominated with closely cropped grasses, consisting of: velvetgrass, bluegrass, bentgrass, and reed canarygrass with areas of water parsley, soft rush, and hardhack spirea.

The South Site is situated of a gentle south-facing aspect. Surrounding land use is comprised of: the Airport, related commercial enterprises, single-family residences, open space/conservation easement, and retail. Vegetation communities consist of periodically maintained field and forestlands. In the field, the vegetation consists of soft rush (Juncus effusus), taper-tip rush (Juncus acuminatus), redtop bentgrass (Agrostis, gigantia), velvet grass (Holcus lanatus), meadow foxtail (Alopocurus pratensis), and slough sedge (Carex obnupta). In the forested areas, dominant vegetation consists of Douglas fir (Pseudotsuga menziesii), black hawthorn (Crataegus douglasii), Nookta rose (Rosa nutkana), Himalayan blackberry (Rubus armeniucus), scot's broom (Cytisus scoparius), snowberry (Symphoricarpus albus), tall fescue (Festuca arundinacea), and field horsetail (Equicetum arvense).

The identified wetlands on the Airport Site are labeled as Wetlands A, B, and C. Based on observations, site topography, previous salinity tests and discussions with the WSDOE, Wetlands A, B, and C were historically two hydrogeomorphically distinct units, which WRI has broken into three wetland units for the purpose of this investigation. The northern unit is a tidally influenced peat wetland (Wetland A). The southwestern unit is a groundwater fed slope wetland (Wetland B). The central unit (Wetland C) is a groundwater and impervious surface fed, slope wetland in the median between the tarmac. The boundary between Wetland Units A and B is approximately halfway between wetland flags NEW19 and NEW20. The portions of Wetlands B and C that lie within the airport improvement site are currently functioning as drainage swales. These wetlands function to store and convey much of the runoff from adjacent impervious surfaces. In addition, two ditched streams are located within the boundary of the site. Stream 1 are drainage ditch within the boundary of Wetland A, while Stream 2 originates off-site to the east and flows along the eastern property line. Please see the attached figures for a detailed location of the mapped wetland and stream units.

The identified wetland on South Site is labeled as Wetland D and covers most of the site, including the pasture and forested areas. Prior to development in the East Sound area, the wetland may have extended all the way to Fishing Bay. A ditched channel (Stream 3) through the on-site portion of this wetland appears to have been intentionally created several decades ago to control and convey the hydrology within the wetland for agricultural use. It shall be classified as a stream because it is conveying natural hydrology. The numerous blocks and lack of spawning habitat are indicators that this onsite stream would not be accessible nor suitable

habitat for fish. WRI did not find any documented evidence that the stream supports fish habitat.

2.1 Existing Wetlands and Other Aquatic Resources on or Adjacent to the Development Site

Mitigation will be required to meet San Juan County, Corps of Engineers (Corps), and the Washington State Department of Ecology (DOE) requirements. Wetlands were rated according to the most current/revised version of the Washington State Wetland Rating System for Western Washington: 2014 Update. (Publication #14-06-029):

Wetland A – Category I

Wetland A has a Riverine HGM class and receives a total score of 24 points on the DOE Wetland Rating Form (2014), which equates to a Category I classification.

Wetland B - Category III

Wetland B is a Slope wetland and receives a total score of 18 points on the DOE Wetland Rating Form (2014), which equates to a Category III classification.

Wetland C - Category IV

Wetland C is a Slope Wetland and receives a total score of 14 points on the DOE Wetland Rating Form (2014), which equates to a Category IV classification.

Wetland D - Category III

Wetland D is a Depressional and receives a total score of 18 points on the DOE Wetland Rating Form (2014), which equates to a Category III classification.

Streams 1, 2, and 3

According to WAC 222-16-030 and 222-16-031, Streams 1, 2, and 3 all meet the criteria of Type Np (Type 4) streams. According to SJCC Chapter 18.30.160.E, the streams are dedicated 100-foot high intensity water quality buffers and 50-foot tree protection buffers.

Table 1 below summarizes the on-site wetland classifications using the various classification systems described above:

Table 1: Wetland Classification Summary

Wetland	Category (Cowardin)	Hydrogeomorphic Class (HGM)	Category (DOE/SJC)
A	PFOP	Riverine	Category I
В	PFOC	Slope	Category III
С	PEMC	Slope	Category IV
D	PFOC	Depressional	Category III

2.2 KNOWN HISTORIC OR CULTURAL RESOURCES ON THE DEVELOPMENT SITE

No historical or cultural resources have been identified on the project site.

2.3 Map of the Baseline Conditions of the Development Site and Adjacent Properties

For a map showing the baseline conditions of the project site and adjacent properties, please refer to the Existing Conditions Maps (Figures 1 & 2).

3.0 ASSESSMENT OF IMPACTS AT THE DEVELOPMENT SITE

3.1 AREA (ACREAGE) OF WETLAND IMPACTS Airport Site

Due to the tarmac's close proximity to several wetlands and streams, the proposed improvement project is expected to impact on-site critical areas.

The installation of necessary navigation aids on the western side of the runway will permanently impact .06 acres of Wetland A (Category I), and site grading and drainage improvements on the site will impact 0.8 acres of Wetland B and 1.5 acres of Wetland C.

Hydrologic control and water quality improvement functions are the two typical wetland functions expected to be impacted as a result of this project. Vegetation to be impacted consists of maintained emergent species, including: common velvet grass, water parsley, soft rush, dagger leaf rush, taper-tip rush, golden-eyed grass, and annual bluegrass.

The on-site wetlands to be impacted have been altered in the past. They have been straightened and cleared of native vegetation. They function to convey and treat surface water runoff from surrounding impervious areas. These critical areas provide limited habitat functions.

Water quality improvement functions will be mitigated, as runoff will be treated by biofiltration using filter strips along the pavement shoulders.

To mitigate the loss of vegetated wetland areas, the applicant will propose wetland mitigation measures within the off-site wetland system west of the airport. See a detailed description of the proposed mitigation measures provided in the remainder of this report.

South Site

No permanent loss of wetlands is anticipated as part of the tree removal proposal on the South Site. The wetland soils may be temporarily disturbed by the equipment and removal of tree stumps, but will be immediately restored following the work. Since no permanent filling or grading is proposed, no loss of hydrologic control functions is expected.

Since there is a ditch (Stream 3) through the site that connects to other downstream systems, there may be concern with short and long term water quality impacts. In the short term, water quality impacts will be mitigated through the installation of erosion control fencing along the edges of the ditch. Other prevention measures include clearing only in the driest part of the year (June – September). To protect long-term water quality functions in the long term, the Port will avoid mowing within a 25-foot swath along either side of the ditch following the tree removal.

Wildlife usage is limited within the forested portions of Wetland D and adjacent upland areas because of the surrounding developed areas and limited habitat diversity, vegetative species and structure within these areas. This is evidenced by the relatively low score for functions on the DOE rating form for Wetland D. While some passerine birds or mammals may need to relocate to other wooded areas in the vicinity, the proposed tree removal is likely to have *no effect* on significant habitat functions, special features or listed species.

Table 2. Expected Permanent Impacts to Wetlands

WETLAND NAME	WETLAND AREA	PERM. FILLED WETLAND AREA (ACRES)	COWARDIN CLASSIFICATION	CATEGORY (SJC/DOE)	HGM CLASSIFICATION
Wetland A	18.0 ac	0.06	PFOP	I	Riverine
Wetland B	1.1 ac	0.8	PFOC	II	Slope
Wetland C	1.5 ac	1.5	PEMC	III	Slope
Totals	22.6	2.36			

3.2 DESCRIPTION OF THE WATER REGIME

Wetlands B and C are hydrogeomorphically classed as slopes wetlands. The source of hydrology for these wetlands includes surface runoff, seasonal high water table, and precipitation. The water in Wetland C generally flows to the north and exits the site via an existing pipe. The water in Wetland B appears to flow to toward Wetland A in the north.

3.3 DESCRIPTION OF THE SOILS

The USDA Natural Resources Conservation Service (NRCS) has mapped the underlying soils associated with this site as Sholander-Spieden complex (0 to 5 percent slope) and Shalcar muck (0 to 2 percent slopes).

Sholander-Spieden complex soil unit is a mix of Scolander and Spieden soils. The Sholander soil formed in valleys, is 40-60 inches thick above the restrictive layers and is somewhat poorly drained. The typical profile of a Sholander soil unit is gravelly loam in the upper 8 inches over gravelly sandy loam and gravelly loamy sand. The Spieden soil formed in drainageways. It is more than 80 inches thick above a restrictive layer and is poorly drained. The typical profile of a Spieden soil is approximately 4 inches of mucky silt loam over silt loam from approximately 4-11 inches below the surface and gravelly loamy sand below 11 inches.

Shalcar muck soil formed in depressions. It is a deep, very poorly drained soil comprised of highly decomposed plant material over glacial outwash. The upper 22 inches of the Shalcar muck soil unit profile consist of muck. Sublayers consist of fine sandy loam and silt loam. The Shalcar muck soil unit is listed as a hydric soil.

3.4 DESCRIPTION OF THE VEGETATION

The wetlands are vegetated with regularly maintained herbaceous species, including the following: common velvet grass (*Holcus lanatus*, Fac), water parsley (*Oenanthe sarmentosa*, Obl), soft rush (*Juncus effusus*, FacW), dagger leaf rush (*Juncus ensifolius*, FacW), taper-tip rush (*Juncus*

acuminatus, Obl), golden-eyed grass (Sisyrinchium californicum, FacW), and annual bluegrass (Poa annua, Fac).

The non-wetland areas are also regularly mowed and generally consist of the following: velvet grass (*Holcus lanatus*, Fac), red clover (*Trifolium pretense*, FacU), annual bluegrass (*Poa annua*, Fac), bentgrass (*Agrostis tenuis*, Fac), orchard grass (*Dactylis glomerata*, FacU), and Common dandelion (*Taraxacum officinale*, FacU).

No rare plants or rare plant communities are known to occur on this site or adjacent properties.

3.5 DESCRIPTION OF FAUNA USING THE SITE

Given airplane traffic and the lack of vegetation cover, there are few wildlife species expected to use the subject site. However, there are vegetated habitats adjacent to the project site, which may support the following species: black tailed deer (Odocoileus hemionus), eastern cottontail rabbits (Sylvilagus floridanus), and Townsend's vole (Microtus townsendi), Bald eagle (Haliaeetus leucocephalus), Osprey (Pandion haliaetus), Red-Tailed hawk (Buteo jamaicensis), Pileated Woodpecker (Dryocopus pileatus), American crow (Corvus brachyrhynchos), common Raven (Corvus corax), American robin (Turdus migratorius), house finch (Carpodacus mexicanus), Mallard (Anas platyrhynchos), black-capped chickadee (Poecile atricapillus), bushtit (Psaltriparus minimus), northern flicker (Colaptes auratus), hairy woodpecker (Picoides villosus), downy woodpecker (Dendrocopus villosus), red-breasted nuthatch (Sitta canadensis), and barred owl (Strix varia).

These lists are not meant to be all-inclusive and may omit species that currently utilize or could utilize the site. No threatened or endangered species are known to be associated with the site.

3.6 WETLAND FUNCTIONS AND VALUES Methodology

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to this site, but is typical for assessments of similar systems common to western Washington.

Wetlands in western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater control, water quality improvement, fish and wildlife habitat, aesthetic value, recreational opportunities, and education. Assessments of these functions for the project site are provided below.

Existing Conditions

Wetland A

Wetland A covers more than 20 acres of land and includes forested, shrub, and emergent vegetation classes. The wetland appears to have been significantly altered several decades ago. The stream flowing through Wetland A has been ditched; and vegetation throughout the wetland has been historically cleared and reestablished (based on Google Earth images).

Most of this wetland is tidally influenced and dominated by emergent vegetation. It is comprised of peat soils (Shalcar Muck). Organic soils, such as the Shalcar Muck soil series mapped on this site, function to control flooding and absorb excess pollutants in the surface waters.

The diverse habitat types and special features in and surrounding this wetland affords this wetland a moderately high habitat score. Based on these existing conditions, this wetland is expected to provide valuable habitat for a variety of bird species. Additionally, there is evidence of use by dear, rabbits, and a variety of other small mammals and rodents.

Overall, Wetland A offers moderately high levels of typical wetland functions and values. Due to is altered condition and established invasive species, there appears to be potential to improve the level of functions within this wetland through vegetation enhancement.

Wetland B

Wetland B is a slope wetland located immediately along the west side of the airport runway. The main body of Wetland B extends off-site to the west into an immature forested vegetation class. The on-site portion of Wetland B consists of maintained (mowed) emergent vegetation. This wetland receives its hydrology from a high groundwater table as well as from surface runoff. The level of habitat within this wetland is moderate, due to the moderate plant diversity and vertical structure within the off-site portions. However the on-site emergent portion of this wetland severely limited levels of habitat function, due to its proximity to airplane traffic. Based on existing conditions, this wetland received moderately low scores for typical wetland scores on the DOE wetland Rating form.

Wetland C

Wetland C is a slope wetland located in the median between the taxiway and the runway of the airport. It is comprised of maintained emergent vegetation. This wetland receives its hydrology from a high groundwater table as well as from surface runoff from the paved airport runway, although there is little evidence of significant ponding for long periods within this wetland. This wetland is isolated from other diverse habitats by surrounding paved areas. Thus, potential habitat functions are severely limited. Based on existing conditions, this wetland received moderately low scores for typical wetland scores on the DOE wetland Rating form.

3.7 WETLAND RATING

Wetland A receives a total score of 24 points on the DOE Wetland Rating Form (2014), which equates to a Category I classification.

Wetland B receives a total score of 18 points on the DOE Wetland Rating Form (2014), which equates to a Category III classification.

Wetland C receives a total score of 14 points on the DOE Wetland Rating Form (2014), which equates to a Category IV classification.

Wetland D receives a total score of 18 points on the DOE Wetland Rating Form (2014), which equates to a Category III classification.

3.8 BUFFERS

According to Wetland Mitigation In Washington State, Part 1, Version 1 (DOE, 2005), the recommended buffer for Category IV wetlands is 50 feet; Category III wetlands is 80, and Category I wetlands is 150 feet.

3.9 WATER QUALITY

No waters on or adjacent to the subject property are listed on the 303d list for Washington State (DOE, 2012).

4.0 MITIGATION APPROACH

4.1 MITIGATION SEQUENCING

Airport Site

The Orcas Island Airport facility has not been improved for several years. The proposal described earlier is a necessary advancement toward meeting current and future airport traffic needs and more importantly, the proposed actions are necessary to comply with FAA requirements. Improvements of the airport facility will result in unavoidable impacts to the critical areas described above. Because these wetlands are so close to the pavement, there does not appear to be an alternative design that would result in less impact to wetlands. To compensate for the impacts, the applicant proposes to replace impacted functions through wetland creation and enhancement.

South Site

FAA safety standards require all potential obstructions, such as trees and shrubs, to be removed from the approach surface within the area of the flight path. Therefore, as part of the airport improvements described above, the Port is proposing to remove existing tree and shrub canopies within the Port-owned South Site, which is part of the approach surface to the airport runway.

With regard to mitigation sequencing, it is presumed that FAA safety standards outweigh critical area protection standards. Since the areas of the trees are directly within the flight path of the airport, it is necessary to remove them and maintain the site as mowed pasture in order to prevent new trees from establishing. To minimize impacts to the greatest extent possible, the applicant will restore all temporarily disturbed soils following the clearing and stump removal to ensure no permanent loss of wetland areas. As part of this plan, the applicant will plant a vegetated swath of native shrubs along the ditch channel to prevent mowing up to the channel edge and to protect water quality function. To conclude: impacts cannot be avoided while also complying with FAA requirements; thus minimization and mitigation will be carried out by not permanently impacting the on-site wetland and by enhancing the edge of the channel with shrubs.

Proposed Mitigation Plan: Airport Site

The mitigation project will be required to meet both San Juan County and Department of Ecology/Corps of Engineers requirements. For this project, the applicant will propose a combination of wetland creation and wetland enhancement. This is intended to meet the minimum requirements of all regulating agencies. By implementing a combination of wetland creation and wetland enhancement, the mitigation plan will result in a total of 2.54 acres of

wetland creation and 6.2 acres of wetland enhancement. In addition, 1.3 acres of buffer associated with the newly created wetland area shall be enhanced with native vegetation.

Table 3: Wetland Types and Ratios
Wetland Impacts and Mitigation Ratios Table

Wettand Impacts and Mitigation Ratios Lable						
Wetland	Category (DOE/SJC)	Impact Area	Required Mitigation Ratio (DOE)	Combination of Creation (C) & Enhancement (E)		
Wetland A	Category I	0.06 acres	4:1 Creation (C)	0.24 acres (C)		
Wetland B	Category III	0.8 acres	1:1 C / 4:1 Enhancement (E)	0.8 acres (C) / 3.2 acres (E)		
Wetland C	Category IV	1.5 acres	1:1 C / 2:1 E	1.5 acres (C) / 3 acres (E)		
	,			Total = 2.54 acres (C) / 6.2 acres (E)		

The selected mitigation site is located west of the airport runway, within the approximate 40-acre parcel also owned by the Port of Orcas. This site is ideal for mitigation, considering the potential for enhancement opportunities within Wetlands A and B and the vacant land available for wetland creation. This site is designated within the Water Resources Inventory Area (WRIA) 2.

Proposed Mitigation Plan: South Site

The proposed mitigation measures for the tree clearing in the South Site will include:

- 1) Immediate restoration of any disturbed soils, if necessary, and then grass seeding all bare ground areas.
- 2) Mowing shall be avoided within 25 feet of either side of the channel to protect water quality functions within the ditch.
- 3) Ongoing maintenance to control pioneer tree species shall be allowed throughout this property.

4.2 Project Specific Goals and Objectives

The main goal of this mitigation plan is to replace the functions and values lost through wetland fill on the Airport Site and wetland and buffer clearing on the South Site. Specifically, the applicant will replace lost hydrologic control functions and water quality improvement functions as well as establish a diversity of native species in a larger off-site wetland and ensure long-term protection of this wetland system. To achieve this, specific goals have been established and are listed below. The wetland creation area has been designed to create a scrub/shrub and eventually forested wetland.

Goal 1. Replace wetland functions through creation of additional wetland.

• **Objective 1.** Create 2.54 acres of wetland adjacent to Wetland B.

Goal 2. Establish a native vegetated corridor and improve species richness for wildlife habitat.

• **Objective 1.** Enhance 6.2 acres of wetland areas mostly within Wetland B.

• **Objective 2.** Enhance 1.3 acres of Wetland B buffer as described this report.

Goal 3. Protect Existing wildlife habitat.

• **Objective 1.** Preserve approximately 25 acres of wetland and upland areas.

Goal 4. Protect Water Quality within Wetland D.

• **Objective 1.** Avoid mowing within 25 feet on either side of the ditch.

4.3 MITIGATION STRATEGY

The applicant is proposing to accomplish the objectives stated above through the following measures:

- Create 2.54 acres of scrub/shrub wetland. Creation will occur adjacent to Wetland B.
- Enhance 6.2 acres of Wetland A and adjacent stream with native plant species.
- Enhance 1.3 acres of Wetland B buffer as described this report.
- Place critical area signs along the boundary of the designated wetland buffer to clearly mark the boundary of the protected area.
- Place markers 25 feet from the channel that are approximately 100 feet apart to clearly demarcate the areas not to be mowed.

5.0 Proposed Mitigation Site

5.1 MITIGATION SITE SELECTION

Washington State Department of Ecology publication #09-06-032, Selecting Wetland Mitigation Sites Using a Watershed Approach, dated December 2009, was used to evaluate the selected mitigation site. Although San Juan County does have a Watershed Management Action Plan for several priority watersheds in the area, there is no existing watershed plan that specifically addresses the area containing the Orcas Island Airport. See attachments at the end of this report for Watershed Approach tables.

The selected mitigation site is located within the property west of the airport runway, which is owned by the Port of Orcas. This is where the majority of Wetlands A and B occur. The site has been previously degraded, cleared, and ditched over the decades. This site is ideal for mitigation, considering its degraded condition.

The selected wetland enhancement area will occur mostly within Wetland B and a portion of Wetland A. The enhancement areas of Wetland B currently consist of three different vegetation types, including grasslands, scrub-shrub and immature alder forest. The grassland areas predominantly consist of invasive reed canarygrass, which will be cut and controlled as part of the enhancement.

The remaining portions of Wetland B that are proposed for enhancement were logged within the last 20 years. Native vegetation has slowly regenerated; however, species diversity is limited to only red alder in the canopy. Because surrounding areas are also cleared of native vegetation, native conifer recruitment potential is low. Planting these areas with a diversity of native tree

species will significantly improve the species diversity and complexity within Wetland B; thereby enhancing the habitat functions within the wetland.

The enhancement of Wetland A will be limited to its outer portion, as most plant varieties found in nurseries are presumed to be too sensitive to the higher salinity levels of the tidally influenced center portions of this wetland. The enhancement is intended to convert degraded grasslands into a scrub-shrub and eventually a forested wetland community.

The site is located in WRIA 2. There does not appear to be an off-site mitigation bank program for this area. No other preferred mitigation alternatives within this watershed were identified.

The proposed mitigation site will be adjacent to a slope HGM class, where the slope is slight and the wetland is primarily groundwater fed. The mitigation areas will receive hydrology from overland flows, precipitation, and high groundwater table.

The proposed wetland creation site is currently comprised of mixed grasses with lesser amounts of scrub-shrub vegetation. Grasses, including reed canarygrass, dominate the enhancement area. Most of the creation consists of Mitchellbay-Sholander-Bazal complex soils (0 to 8 percent slopes), while the enhancement area is underlain with Shalcar muck (0 to 2 percent slopes).

Adequate hydrology for the wetland creation area is anticipated to occur through interception of ground water associated with adjacent existing wetlands. Due to readily available water sources, it appears that grading for the wetland creation should be sufficient to create wetland hydrology. The goal of this wetland creation is to achieve a seasonally saturated wetland.

Given the historically altered state of the existing vegetation within the enhancement area, one of the main constraints includes converting reed canarygrass-dominated areas into a mixed tree and shrub community. Proper site preparation and regular maintenance will address this and improve chances of success.

5.2 MITIGATION TYPE AND LOCATION HIERARCHY

The applicant carefully considered the mitigation options for the proposed impacts. Constraints were identified, such as the County preference to mitigation on-site and in-kind. Other constraints include the lack of a mitigation bank and watershed plan within the project basin. The following is the hierarchy of mitigation options presented in Section 332.3(b)(2)-(6) of the Federal Compensatory Mitigation for Losses of Aquatic Resources Final Rule and associated rational for proposed mitigation:

- **Mitigation bank credits** Mitigation banking is not identified in the San Juan County Code as an option for wetland mitigation. In addition, no mitigation bank credits are currently available within the project basin (WRIA 2).
- **In-lieu fee program credits** In-lieu fee is not identified in San Juan County Code as a potential option for wetland mitigation. In addition, no in-lieu fee program is available within the project basin (WRIA 2).
- **Permittee-responsible mitigation under the watershed approach** Washington State Department of Ecology publication #09-06-032, Selecting Wetland

Mitigation Sites Using a Watershed Approach, dated December 2009, was used to evaluate the selected mitigation site. Based on application of this methodology, it is anticipated that by implementing the proposed mitigation, a lift in water quality and wildlife habitat functions can be expected.

- **Permittee-responsible mitigation, on-site in kind** The airport improvement project eliminates most of the low-quality wetlands on the site. The nature of the project eliminates any potential area for providing on-site, in-kind mitigation. In addition, FAA regulations would prohibit any creation of habitat with tall vegetation that can attract birds in the immediate vicinity of the airport runway. On-site and in-kind mitigation cannot be achieved.
- **Permittee-responsible mitigation, off-site and out of kind** The selected mitigation site is located within the property west of the airport runway, which is owned by the Port of Orcas. This is where the majority of Wetlands A and B occur. The site has been previously degraded, cleared, and ditched over the decades. This site is ideal for mitigation, considering its degraded condition.

5.3 SECTION 332.3(a)(1) Compliance

• **Likelihood of ecological success** – The applicant is proposing a combination of wetland creation and wetland enhancement. The proposed mitigation site will be adjacent to a slope HGM class, where the slope is slight and the wetland is primarily groundwater fed. Adequate hydrology for the wetland creation area is anticipated to occur through interception of ground water associated with adjacent existing wetlands. Due to readily available water sources, from overland flows, precipitation, and high groundwater table, it appears that grading for the wetland creation should be sufficient to create wetland hydrology.

The proposed plant schedules for both the enhancement and creation areas will be carefully selected based on anticipated moisture, soil, and salinity conditions for the areas.

In addition, Chart 2 of the Watershed Approach has been completed and the proposed mitigation site satisfies the watershed scale criteria for potential and sustainability.

- Location of the compensatory mitigation site relative to the impact site The selected mitigation site is located within the property west of the airport runway, which is owned by the airport. This is where the majority of Wetlands A and B occur. It is the professional opinion of WRI that this is the best available location for direct compensation of the proposed impact within this basin.
- **Cost of the proposed mitigation** The estimated cost of plant materials and labor is \$85,368.00. This estimate excludes soil amendments, equipment, labor, and other materials.

In addition, the cost of monitoring and maintenance is anticipated at approximately \$30,000 for the ten-year monitoring period.

• **Long-term management** – Upon completion of the ten-year monitoring period, the applicant will pass the long-term management and associated financial responsibilities to the future owner of the mitigation site. The transition and associated financial responsibilities will be addressed in the subdivision's codes, covenants and regulations.

5. 4 LOCATION AND SIZE OF MITIGATION AREA

The proposed mitigation will occur within and adjacent to existing wetlands. The total area included in the mitigation plan is approximately 9.0 acres

5.5 SITE OWNERSHIP

The owner of this mitigation site is:

Port of Orcas PO Box 53 East Sound, WA 98245

Following completion of this project, the mitigation areas and adjacent critical areas and buffer will be placed in a separate tract to be protected in perpetuity.

6.0 MITIGATION SITE PLANS/DESIGN

The selected mitigation site is located west of the airport runway, within the approximate 40-acre parcel also owned by the Port. This site is ideal for mitigation, considering the potential for enhancement opportunities within Wetland A and the vacant land available for wetland creation. Providing a combination of wetland creation and wetland enhancement ensures sufficient replacing and net improvement to the functions and values of the site. This site is designated within the Water Resources Inventory Area (WRIA) 2.

6.1 DESCRIPTION OF THE WATER REGIME

Hydrology will be supplied to the mitigation area via surface runoff, seasonal high water table, and precipitation. This will be achieved by creating wetland areas that are adjacent to existing wetland areas where created elevation will match existing wetland areas. Given that the primary mitigation proposed for this project is wetland enhancement, wetland hydrology will be fully maintained.

6.2 SOILS

The USDA Natural Resources Conservation Service (NRCS) has mapped the underlying soils associated with the mitigation site as: Mitchellbay-Sholander-Bazal complex (0 to 8 percent slopes) and Shalcar muck (0 to 2 percent slopes).

The Mitchellbay-Sholander-Bazal complex, 0 to 8 percent slopes is described as somewhat poorly drained and partially hydric that formed mostly in valleys.

Shalcar muck soil formed in depressions. It is a deep, very poorly drained soil comprised of highly decomposed pant material over glacial outwash. The upper 22 inches of the Shalcar

muck soil unit profile consist of muck. Sublayers consist of fine sandy loam and silt loam. The Shalcar much soil unit is listed as a hydric soil.

6.3 VEGETATION

Vegetation within the proposed creation area is comprised of sporadic Nootka rose (*Rosa nutkana*), snowberry (*Symphoracarpus albus*), Himalayan blackberry (*Rubus armeniacus*), bentgrass (*Agrostis tenuis*) as well as tall fescue (*Festuca arundinacea*), reed canarygrass (*Phalaris arundinacea*), Canada thistle (*Circium arvense*).

6.4 SITE PREPARATION/CONSTRUCTION ACCESS

Wetland creation and enhancement is proposed as mitigation for wetland impacts.

For the designated creation area, erosion control fencing will be installed on the downslope edge of the creation area, between the existing wetland and the created wetland. The boundaries of the creation area will be clearly marked in the field. The area will then be sub-excavated to an elevation approximately 12 inches below that of the adjacent wetland area. The area will then be backfilled with an appropriate organic topsoil mix to match the elevations of the adjacent wetland areas. Once the excavation work is completed, planting will follow.

For the wetland enhancement area, control of the reed canarygrass will be the main focus of the site preparations on this site. Suggested methods to controlling the reed canargrass will include mowing then roto-tilling the area. Upon completion of roto-tilling, the infested areas should then be covered with a biodegradable material such as cardboard and then minimum 4-6 inches of hog fuel. If small patches of reed canarygrass return, a licensed applicator may apply an herbicide, if allowed by DOE and the County. We recommend that all reed canary grass in these areas be cut twice annually (once in spring, once in late summer) as close to the ground as possible. In the spring, the reed canary grass should be cut before seed head appear.

6.5 MITIGATION OVERSIGHT

The Corps requires the applicant to retain a qualified wetland professional to be on site during construction to ensure the intent of the project is carried out. If possible, this should be the same person involved with the design of the project. The person overseeing the construction of the project should be responsible for:

- Ensuring the actual environmental/wetland conditions at the site match those used in the design.
- Guaranteeing that the approved plan is followed.
- Overseeing grading and soil preparation.
- Ensuring that delivered or salvaged plants are as specified and are alive upon installation.
- Authorizing deviation from the compensatory mitigation plan if specifically allowed in permit documents.

- Coordinating with agency staff on any alterations to the plan.
- Documenting and justifying any alterations to the plan in an as-built report.

6.6 PROTECTION OF EXISTING HABITAT

Prior to site clearing and grading, all clearing limits and NGPA areas shall be marked using silt fence or orange construction fencing as appropriate.

6.7 WETLAND CREATION

As mitigation for wetland impacts, the applicant is proposing to create a total of 2.54 acres of wetland adjacent to Wetland B. Wetland creation will take place immediately upon receipt of applicable permits, but prior to completion of the airport improvement project.

The designated creation area will be identified and clearly marked in the field prior to beginning construction. Erosion control measures will be installed and properly functioning to minimize downstream sedimentation. The area will be sub-excavated to one foot (12") below the existing grade of the adjacent wetland. Side slopes from the wetland creation area shall be graded to a minimum 3:1 ratio. Topsoil with a minimum of 30 percent organic content will be backfilled into the excavated wetland creation area so that the final elevation will match that of the adjacent existing wetland. The project will likely require importation of loam soils with an organic component. Such soils are ideal for planting and retaining moisture to create wetland conditions.

It is anticipated that following the first full year of seasonal changes in temperature, precipitation, and vegetation establishment, soils within the created wetland areas will begin to establish hydric soil characteristics.

It is anticipated that the created wetland area will achieve a similar hydrologic regime as Wetland B. The created wetland area may contain some micro-depressions that will temporarily trap and store stormwater. However, similar to the main body of Wetland B, the created wetland area is not expected to be inundated year-round.

Trees will be planted on 15-foot centers and shrubs will be planted on 6-foot centers. For a map of the mitigation areas, please refer to Figure 3.

Wetland Creation - 2.54 acres (110,642 SF)

Common Name	Latin Name	Size	Spacing	Quantity	
Sitka spruce	Picea sitchensis	1 gal	15'	110	
Shore Pine	Pinus contorta	l gal	15'	110	
Western red cedar	Thuja plicata	1 gal	15'	90	
Western crabapple	Malus fusca	l gal	15'	90	
Red alder	Alnus rubra	1 gal	15'	90	
Red osier dogwood	Cornus sericea	l gal	6'	385	
Pacific willow	Salix lucida	1 gal	6'	385	
Hooker's willow	Salix hookeriana	1 gal	6'	385	
Black twinberry	Lonicera involucrata	1 gal	6'	385	
Nootka rose	Rosa nutkana	1 gal	6'	260	
Pacific ninebark	Physocarpus catitatus	1 gal	6'	260	
Salmonberry	Rubus spectabilis	1 gal	6'	260	
Black hawthorn	Crataegus douglasii	1 gal	6'	260	

6.8 WETLAND ENHANCEMENT

The applicant will enhance a total of 85,600 square feet (4.2 acres) of grass/shrub wetland areas and a total of 87,120 square feet (2.0) acres of red alder-dominated wetland areas. The enhancement areas are labeled as Wetland Enhancement Areas 1 and 2, respectively (see conceptual mitigation plan, Figure 3).

The proposed enhancement area covers portions of both Wetlands A and B. The enhancement will focus on establishing a diversity of native species to the transitional areas between the emergent vegetation of Wetland A and forested vegetation of Wetland B. As part of the plant installation, existing weedy vegetation will be scalped or pruned in order to make space for new plant species. Complete eradication of the invasive plant cover on this site is not the intent of this enhancement, as that would be unattainable for this site.

The proposed plant spacing takes into account existing native vegetation within portions of the enhancement areas. In Wetland Enhancement Area 1, trees will be planted on 15-foot centers and shrubs will be planted on 8-foot centers. In Wetland Enhancement Area 2, trees will be planted on 15-foot centers. For the location of the proposed mitigation areas, please refer to Figure 2 in this report.

Wetland Enhancement Area 1 - 4.2 ac (185,900 SF)

Common Name	Latin Name	Size	Spacing	Quantity	
Shore Pine	Pinus contorta	1 gal	15'	240	
Red alder	Alnus rubra	1 gal	15'	180	
Sitka spruce	Picea sitchensis	1 gal	15'	150	
Western crabapple	Malus fusca	1 gal	15'	150	
Western red cedar	Thuja plicata	1 gal	15'	100	
Nootka rose	Rosa nutkana	1 gal	8'	800	
Hooker's willow	Salix hookeriana	1 gal	8'	800	
Black twinberry	Lonicera involucrata	1 gal	8'	480	

Wetland Enhancement Area 2 - 2.0 ac (87,120 SF)

Common Name	Latin Name	Size	Spacing	Quantity	
Sitka spruce	Picea sitchensis	l gal	15'	124	
Western red cedar	Thuja plicata	1 gal	15'	124	
Shore Pine	Pinus contorta	1 gal	15'	70	
Western crabapple	Malus fusca	1 gal	15'	70	

6.9 BUFFER ENHANCEMENT

The applicant proposes to enhance a total of 30,800 square feet of the buffer adjacent to the wetland creation area on Wetland B. Existing weedy vegetation will be scalped or pruned in order to make space for new plant species. Trees will be planted on 15-foot centers and shrubs will be planted on 6-foot centers. For the location of the proposed mitigation areas, please refer to Figure 3 in this report.

Wetland E Enhancement 1.3 ac (58,274 SF)

Common Name	Latin Name	Size	Spacing	Quantity	
Western red cedar	Thuja plicata	1 gal	15'	96	
Douglas fir	Picea sitchensis	1 gal	15'	96	
Red alder	Alnus rubra	1 gal	15'	88	
Snowberry	Symphoracarpus albus	1 gal	6'	440	
Nootka rose	Rosa nutkana	1 gal	6'	440	
Douglas hawthorn	Crataegus douglasii	1 gal	6'	200	
Salmonberry	Rubus spectabilis	1 gal	6'	360	
Sword fern	Polystichum munitum	1 gal	6'	360	

6.10 GRASS SEED MIXTURE

Following plant installation and mulching, an appropriate wetland seed mixture shall be broadcast throughout the bare ground areas. A suitable mix can be found at Country Green Turf Farms (www.countrygreen.net/) and includes: 70% Tall Fescue, 10% Meadow Foxtail, 10% Seaside Bentgrass, 5% Alsike Clover, 5% Red Top.

6.11 PLANTING NOTES

Mitigation projects of this sort are typically more complex to install than can be described in plans. Careful monitoring by a qualified wetland professional for all portions of this project is strongly recommended. Timing and sequencing is important to the success of this type of project.

Plant in the early spring or late fall. Order plants from a reputable nursery. Care and handling of plant materials is extremely important to the overall success of the project. All plant materials recommended in this plan should be available from local and regional sources, depending on seasonal demand. Some limited species substitution may be allowed, only with the agreement of the consulting wetland professional.

The plants shall be arranged with the appropriate numbers, sizes, species, and distribution to achieve the required vegetation coverage. The actual placement of individual plants shall mimic natural, asymmetric vegetation patterns found on similar undisturbed sites in the area.

Upon complete installation of the proposed mitigation plan, an inspection by a qualified wetland professional shall be made to determine plan compliance. A compliance report shall be supplied to the Corps and Snohomish County within 30 days after the completion of planting.

Colored surveyors ribbon, or other approved marking device, shall be attached to each planted tree and shrub to assist in locating the plants while removing the competing non-native vegetation and to assist in monitoring the plantings.

Wood chips or other suitable material shall be used for mulching in the planting areas. Any existing vegetation is to be removed from a two-foot diameter area at each planting site. Mulch is to be placed in this two-foot diameter area at a depth of three to four inches. A four-inch diameter ring around the base of each plant shall be kept free of mulch. Arborist woodchips are the preferred material for mulch. These can be stockpiled during site clearing or imported.

Irrigation / Watering. Water shall be provided during the dry season (July 1 through October 15) for the first two years after installation to ensure plant survival and establishment. A temporary above ground irrigation system and/or water truck should provide water. Water should be applied at a rate of one inch of water per week for Years 1 and 2.

Soil Amendments. If deemed necessary, organic matter (compost or approved equal) will be incorporated into each of the planting holes, in addition to the designated created wetland area. One unit of loose, well-composted organic material should be incorporated with two units of silt loam topsoil to a depth of eight to ten inches (only three to four inches within three feet of existing drip lines) and mixed thoroughly.

7.0 Maintenance, Monitoring, and Contingency

7.1 MAINTENANCE ACTIVITIES

The purpose of this maintenance program is to ensure the success of the mitigation plantings. The planting areas will be maintained in spring and fall of each year for the first five years and as needed for the remainder of the ten-year monitoring period. The necessity of maintenance in the last five years will be determined by the contracted wetland biologist and a representative from the Army Corps. Maintenance activities will include the following, as necessary:

- · Plant inspection and replacement
- Control invasive species
- Remove noxious weeds
- Remove trash
- Replace signs
- Replace mulch

Following each monitoring, recommendations will be made for the replacement of plant mortality. Any replanting will be done by the contracted landscaper and should be done during the fall maintenance visit. Maintenance should be done by hand to avoid impacts to establishing plants and existing habitat.

7.2 Invasive Species

Invasive species control will be accomplished through the use of hand removal of foliage and roots, whenever possible. Mowing of Himalayan blackberry and Scot's broom is also effective if conducted as part of a routine maintenance schedule (four times per year). Invasive species, such as Himalayan blackberry, reed canarygrass, Scot's broom, and Japanese knotweed are to be controlled within the mitigation area. All Himalayan blackberry and Scot's broom within the mitigation areas shall be cut to ground level during each maintenance visit. Reed canarygrass shall be mowed (cut back or weed whacked) at least twice a year, once in the early spring, prior to formation of the seed heads and again in mid summer. Spray, and or minor grubbing of canarygrass may also occur upon approval of the regulatory biologist. A zero tolerance of noxious weeds, such as Japanese knotweed, is to be implemented and any and all specimens shall be entirely removed from the mitigation area and disposed of in an appropriate off-site location. The goal of this maintenance is to ensure that the planted native species establish as designed.

Once established, it is expected that the native plants will prevent further establishment of invasive species.

7.3 Performance/Success Standards

Performance/success standards have been established to assess the success of the mitigation project in achieving the stated goals. Performance/success standards are as follows:

7.3.1 PLANT SURVIVAL

Year 1 Monitoring

Success Standard: 100 percent survival of planted species

No greater than 15 percent coverage of invasive species. Zero tolerance of

noxious weeds.

Year 2 Monitoring

Success Standard: 90 percent survival of planted species

No greater than 15 percent coverage of invasive species. Zero tolerance of

noxious weeds.

Year 3 Monitoring

Success Standard: Minimum 35 percent aerial coverage of native species

No greater than 15 percent coverage of invasive species. Zero tolerance of

Noxious weeds.

Year 5 Monitoring

Success Standard: Minimum 50 percent aerial coverage of native species

No greater than 15 percent coverage of invasive species. Zero tolerance of

noxious weeds.

Year 7 Monitoring

Success Standard: Minimum 60 percent aerial coverage of native species

No greater than 15 percent coverage of invasive species. Zero tolerance of

noxious weeds.

Year 10 Monitoring

Success Standard: Minimum 80 percent aerial coverage of native species

No greater than 15 percent coverage of invasive species. Zero tolerance of

noxious weeds.

In any monitored year, naturally occurring native species shall count toward the overall percent coverage of native species.

7.3.2 WETLAND HYDROLOGY

Hydrologic conditions within the wetland enhancement areas will not be altered from its current condition.

Hydrologic conditions within the wetland creation areas shall mimic conditions in the adjacent wetland. At a minimum, the creation area shall be saturated to within eight inches of the surface for two weeks of the growing season (March through September).

7.3.3 WILDLIFE HABITAT

During each monitoring visit, the presence of any wildlife using the site should be noted and reported in the monitoring report(s).

7.4 MONITORING PROTOCOL

This mitigation project will be monitored for ten years following completion and approval of the installed plan. Monitoring will be conducted by a contracted wetland professional or other qualified person.

7.4.1 Performance Standards

Performance and success standards are included in Section 7.3 above.

7.4.2 SAMPLING METHODS – PLANT SURVIVAL

Monitoring transects and photo points will be established during the as-built inspection and shown on the as-built map. These will be used throughout the ten-year monitoring period. Plant survival shall be measured during the first two years of monitoring. Monitoring methodology will include establishing transects to evaluate plant survival and cover. Along these transects, sample plots that are representative of the vegetative community will be chosen. These plots shall be fixed, located using stakes, GPS, or other method and used for the duration of the monitoring period. The percentage of plant survival will be derived by subtracting the number of missing or dead plants from the number of plants that were recorded in the transects during the initial visit to assess plan compliance.

Plant survival within the transects is assumed to be representative of the entire site. In addition to the transects, a visual inspection of the entire mitigation area shall be conducted to assess any high mortality areas not represented by the transects. As a supplement to the visual inspection, a panoramic photo of the entire mitigation site will be taken and included in each monitoring report. If one or more of the planted species exhibit a high rate of mortality and are deemed inappropriate for the site, a substitution may be recommended by the consulting biologist.

To provide cover values, the Braun-Blanquet Cover Abundance Scale will be used. Cover is defined as "the vertical crown or shoot-area projection per species in the plot" (Mueller-Dombois et al., 1974). The cover values ratings to be used are as follows:

- Any species with cover more than 3/4 of the reference area (75%)
- Any species with 1/2 3/4 cover (50% 75%)
- Any species with 1/4 1/2 cover (25% 50%)
- Any species with 1/20 1/4 cover (5% 25%)
- Any species with less than 1/20 cover (5%)

(Mueller-Dombois et al., 1974)

The collected data will be analyzed by establishing midpoint percent cover based on the Braun-Blanquet scale. The ratings to be used are as follows:

Cover Class	% Cover	Midpoint
• 5	75 to 100%	88%
• 4	50 to 75%	63%
• 3	25 to 50%	38%
• 2	5 to 25%	13%
• 1	<5%	3%

The percent cover value should be established by adding the values of the plants as they occur in the plots and dividing by the total number of plots. In addition to the above plots, a general overview of the vegetation in the monitoring area shall be conducted.

7.4.3 SAMPLING METHODS – PHOTO DOCUMENTATION

During the site visit for the as-built plan, photo points shall be established throughout the mitigation areas to visually document the changes of the site over time. In addition, a general overview (panoramic) photo of each mitigation area will be provided from a fixed point. These photo points shall be documented and used during each monitoring visit.

7.5 MONITORING SCHEDULE

It is assumed that the entire mitigation plan will be installed concurrent with site development and will be on a common monitoring schedule. The monitoring period will begin upon completion of an as-built report within 30 days after enhancement measures are completed. The as-built report shall be provided to San Juan County and the Corps. The initial monitoring visit (Year 1) will begin at least one year after complete installation of the mitigation plan, in September, prior to leaf drop. Subsequently, monitoring will occur in September of years 2, 3, 5, 7, and 10, until all performance standards are met and approved by the Corps.

7.6 MONITORING REPORTS

After each monitoring visit, a report describing the condition of the mitigation site shall be prepared. These reports shall be submitted to San Juan County and the Corps. These reports will assess both achievement of yearly goals and progress towards achievement of the project goals. Reports will include a description of survival and replacement of the planted stock, plant vigor, percent cover of native vegetation, an assessment of invasive vegetation, an assessment of wildlife using the site, and wetland hydrology. In addition, the monitoring reports shall be prepared to meet the requirements established in Regulatory Guidance Letter No. 08-03 – *Minimum Monitoring Requirements for Compensatory Mitigation Projects* and will, at a minimum, include the following elements:

Project Overview:

- 1. Corps Permit Number or Name of the Mitigation Bank or In-Lieu fee Project.
- 2. Name of party responsible for conducting the monitoring and the date(s) the inspection was conducted.

- 3. A brief paragraph describing the purpose of the approved project, acreage and type of aquatic resources impacted, and mitigation acreage and type of aquatic resources authorized to compensate for the aquatic impacts.
- 4. Written description of the location, any identifiable landmarks of the compensatory mitigation project including information to locate the site perimeter(s), and coordinates of the mitigation site (expressed as latitude, longitude, UTMs, state plane coordinate system, etc.).
- 5. Dates the compensatory mitigation project commences and/or was completed.
- 6. Short statement of whether the performance standards are being met.
- 7. Dates of any recent corrective or maintenance activities conducted since the previous report submission.
- 8. Specific recommendations for any additional corrective or remedial actions.

Requirements:

List all monitoring requirements and performance standards identified in the mitigation plan and any special conditions identified in the Corps permit. Also provide an evaluation describing if the compensatory mitigation project site is successfully achieving the performance standards or trending towards meeting the standards. Provide a table comparing the listed performance standards to the condition and status of the developing mitigation sites.

Summary Data:

Data will be provided that substantiates successes and/or potential challenges. Photo documentation taken along transects will also be provided to provide a visual of site conditions during monitoring visits.

Maps and Plans:

Maps shall be provided within each monitoring report identifying the location of the mitigation site, transection, and photo points.

Conclusion:

Each monitoring report shall provide a general statement of site conditions, compliance with performance standards and recommendations on maintenance and/or contingency measures.

The applicant should notify San Juan County and the Corps in writing when the monitoring period is complete and the criteria for success have been met. If the project meets all of the criteria for success at the end of the ten-year monitoring period, no further action will be required. If the performance/success standards are not met, the maintenance and monitoring period will be extended for one year at a time until the site meets the performance/success standards. If the success criteria are met prior to the end of the ten-year monitoring period, the Corps may allow an early termination of the monitoring and maintenance measures at their discretion. This mitigation plan and the accompanying maintenance and monitoring will not be considered complete until written confirmation is received from the Corps.

7.7 SITE PROTECTION

Following completion of this project, all on-site critical areas will be designated as Native Growth Protection Areas (NGPA), placed in separate tracts for each lot and owned by the property

owner(s). The NGPA tracts are included as part of the final plat approval and will therefore be recorded on the property deed.

Recommended NGPA Language is as follows: "In consideration of San Juan County Code requirements, a non-exclusive Native Growth Protection Area/Easement (NGPA/E) is hereby granted to San Juan County, its successors or assigns. The Native Growth Protection Area/Easement shall be left permanently undisturbed in a substantially natural state. No clearing, grading, filling, building construction, or placement, or road construction of any kind shall occur within said easement area; except the activities set forth in San Juan County Code are allowed, when approved by the County.

If impacts are unavoidable, or if the NGPA is modified in any way, the US Army Corps of Engineers will be notified a minimum of 60 days in advance.

7.8 CONTINGENCY PLAN

If more than 20% of the plants are severely stressed during any of the inspections, or it appears more than 20% may not survive, additional plantings of the same species or, if necessary, alternative species may be added to the planting area. If this situation persists into the next inspection, a meeting with a representative for San Juan County, the consulting wetland specialist and the Corps will be scheduled to decide upon contingency plans. Elements of the contingency plan may include, but will not be limited to, more aggressive weed control, plant mortality replacement, species substitution, fertilization, soil amendments and/or irrigation.

7.9 FINANCIAL ASSURANCE

A performance bond or other assurance device will be provided to San Juan County for the period of ten years from the completion of the project. This bond will be released, upon a successful determination by the County and the Corps for all portions of this mitigation project. The estimated cost of plant materials and labor (7,114 plants at \$12/plant) is \$85,368.00. This estimate excludes soil amendments, equipment, labor, and other materials.

8.0 Long Term Management

Upon completion of the ten-year monitoring period, the applicant will pass the long-term management and associated financial responsibilities to the existing property owner if different than the Orcas Island Airport. The transition and associated financial responsibilities will be addressed in the property title. Long-term management activities will include but are not limited to:

- Control of invasive species
- Maintenance of signage
- Removal of trash and debris
- Reporting

Maintenance activities should occur annually and/or as needed. Annual costs for administering the long-term management plan are expected to decrease over time as the mitigation site matures. This depreciation of maintenance costs is expected to more than compensate for any cost increases associated with inflation. The owner should allocate a minimum of \$1,000 per year for the implementation of the long-term management program. A brief report describing

current conditions and maintenance measures shall be provided to the Corps annually until the Corps changes the frequency.

9.0 REFERENCES

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San Juan County Unified Development Code, Chapter 18.30. San Juan County, Washington. April 2014.

Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. March 2006. Wetland Mitigation in Washington State - Part 2: Developing Mitigation Plans (Version 1). Washington State Department of Ecology Publication #06-06-011b. Olympia, WA.

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Web Soils Survey (USDA, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)

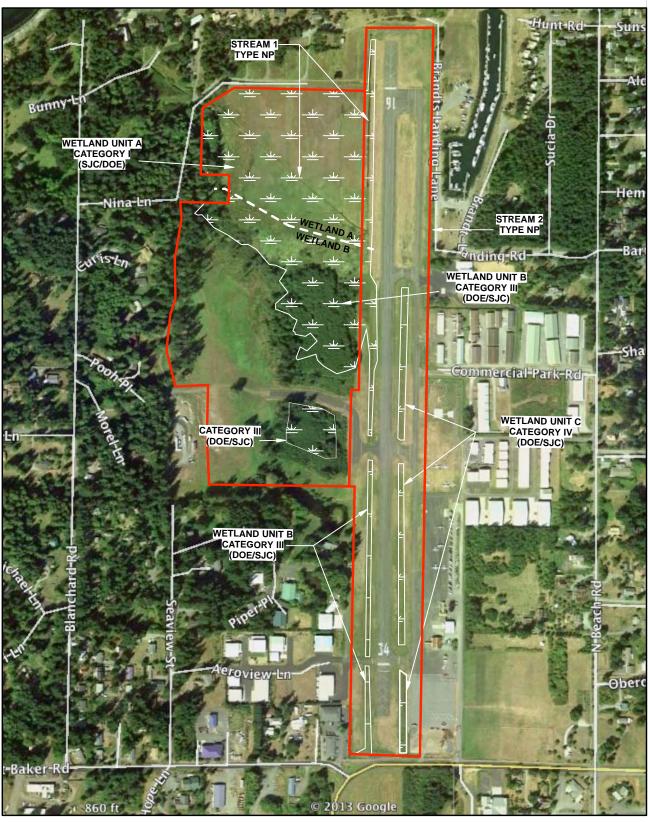
APPENDIX A: FIGURES, PHOTOS AND CHARTS

- Existing Conditions Map Airport Site (Figure 1)
- Existing Conditions Map South Site (Figure 2)
- Conceptual Mitigation Plan (Figure 3)
- Photo Plates 1 and 2
- WH Pacific Exhibit 3 Potential Wetland Impacts (1/4 4/4)
- Selecting Wetland Mitigation Sites Using A Watershed Approach Chart 3 Q&A
- Watershed Approach Chart 2
- Watershed Approach Chart 3
- Watershed Approach Chart 10

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- Watershed Approach Chart 10

FIGURE 1: EXISTING CONDITIONS - AIRPORT SITE ORCAS ISLAND AIRPORT Section 11, Township 37N, Range 2W, W.M. Latitude: 48.706192 Longitude: -122.907186





PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

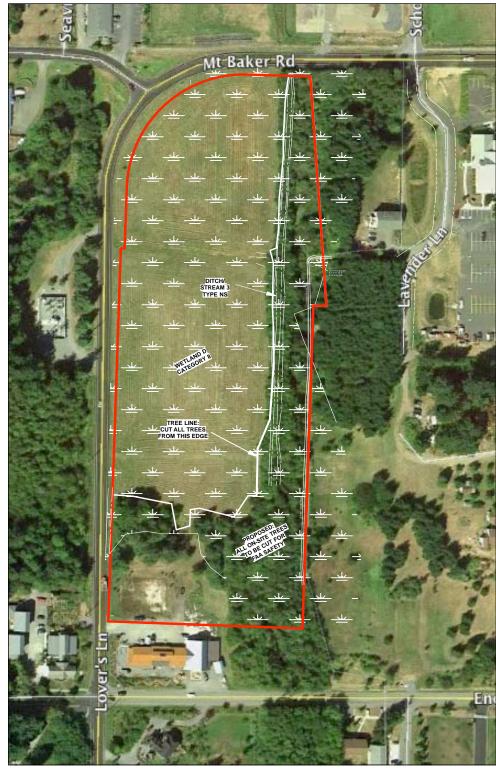
Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

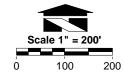
AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure 1 DATE: May 2015

FIGURE 2: EXISTING CONDITIONS - SOUTH SITE ORCAS ISLAND AIRPORT

Section 11, Township 37N, Range 2W, W.M. *Latitude:* 48.706192 *Longitude:* -122.907186





PURPOSE

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 N: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure 2 DATE:May 2015

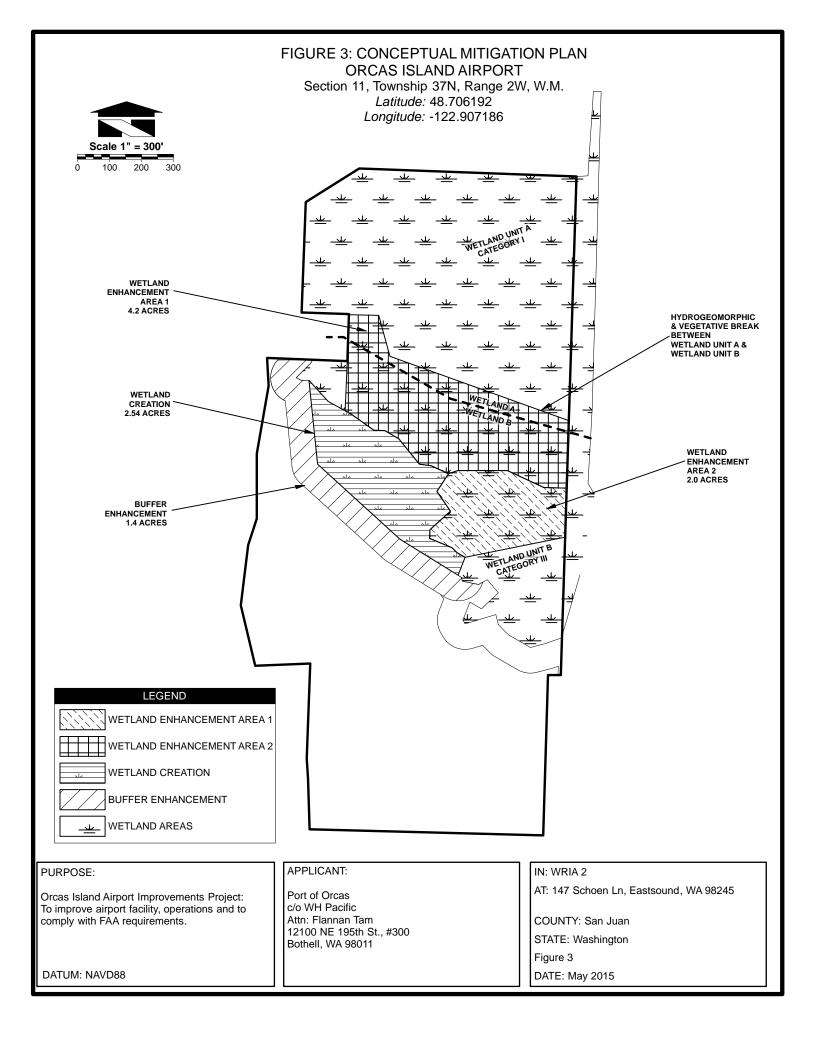


PHOTO PLATE 1: ORCAS AIRPORT IMPROVEMENTS PROJECT (PHOTOS TAKING IN NOVEMBER 2012)



PHOTO 1: VIEW LOOKING NORTH AT WETLAND C ON THE PROPOSED EXPANSION SITE



PHOTO 2: VIEW LOOKING NORTH AT WETLAND B ON THE PROPOSED EXPANSION SITE



PHOTO 3: VIEW LOOKING SOUTH AT WETLAND C ON THE PROPOSED EXPANSION SITE

PHOTO PLATE 2: ORCAS AIRPORT - MITIGATION SITE (DECEMBER 2013)



PHOTO 4: VIEW LOOKING SOUTHWEST AT THE WETLAND ENHANCEMENT AREA IN WETLAND A

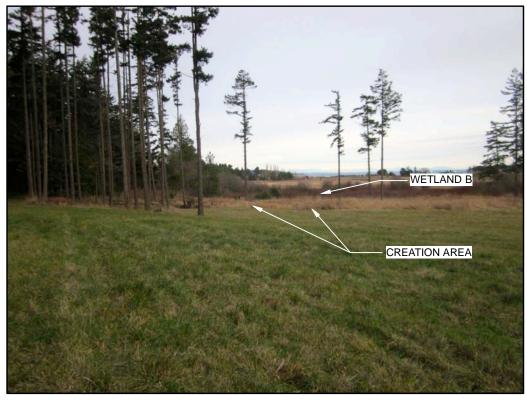


PHOTO 5: VIEW LOOKING NORTH AT WETLAND B AND THE PROPOSED WETLAND CREATION SITE

SCALE 1" = 30'

PLOT DATE 2/27/2013

DRAWING FILE NAME
WETLAND IMPACT AREA_2013.02.27.B

PROJECT NUMBER

[DATE: 2/27/2013 1:56 PM] [AUTHOR: Ibonebrake] [PLOTTER: CutePDF Writer.pc3] [STYLE: WHP-Standard.ctb] [PATH: P:\Port of Orcas\037367\Design\Drawings\XRefs\Exhibit\Wetland Impact Area_2013.02.27.B.dwg] [LAYOUT: 22x34 (2)] HYDROGEOMORPHIC AND VEGETATIVE BREAK BETWEEN **(S10) (S11)** WETLAND UNIT A AND WETLAND A WETLAND UNIT B WETLAND B TOFA C TOFA STORM VAULT RIM 7.37' IE 15" CPSTREAM B IE 18" CM" TYPE 4 (FEET) 1 INCH = 30 FT. TAXIWAY A3 -CULVERT IE 36" CPP (S) 6.96' <u>LEGEND</u> WETLAND IMPACTED BY RUNWAY GRADING (1.1 ACRES) WETLAND IMPACTED BY DRAINAGE WE ILATE
IMPROVEMENTS (1.1 ACRES) -CULVERT (1.1 //GN.E.),
IE 36" CPP (N) 7.08" IMPACTED STREAM (960 LF) ---- APPROXIMATE GRADING LIMIT -CULVERT WE ILAND DOC...

IE 36" CPP (N) 6.93' WETLAND FLAG _... WETLAND BOUNDARY WETLAND UNIT B 0.0% SIDE-SLOPE REQUIRED TO AVOID CATEGORY II SAN JUAN COUNTY WETLAND IMPACT S1) (S21) FIELD DATA SITES (SITES 1-21) CATEGORY III DOE -8.0% -7.6% TAXIWAY CULVERT IE 24" CPP (N) 9.68' WETLAND UNIT C CATEGORY III SAN JUAN COUNTY **S**16 **(S14) (S15)** Category IV DOE 16-RUNWAY -11.4% -9.6% CULVERT IE 18" CMP (S) 14.68' CULVERT IE 18" CMP (N) 14.08' CULVERT IE 18" CMP (S) 15.04' CULVERT (IN FROM S.) IE 18" CPP (S) 16.33" -11.2% -9.6% SHEET INFO ORCAS ISLAND AIRPORT SURVEYED JLA/KB NO. BY DATE REMARKS 2 DRAWN **EXHIBIT 3: POTENTIAL WETLAND IMPACT AREAS** MAD/LEB **WHPacific**

CHECKED

SUBMITTAL

1" = 30'

APPROVED DSW

LAST EDIT 2/27/2013 PLOT DATE 2/27/2013

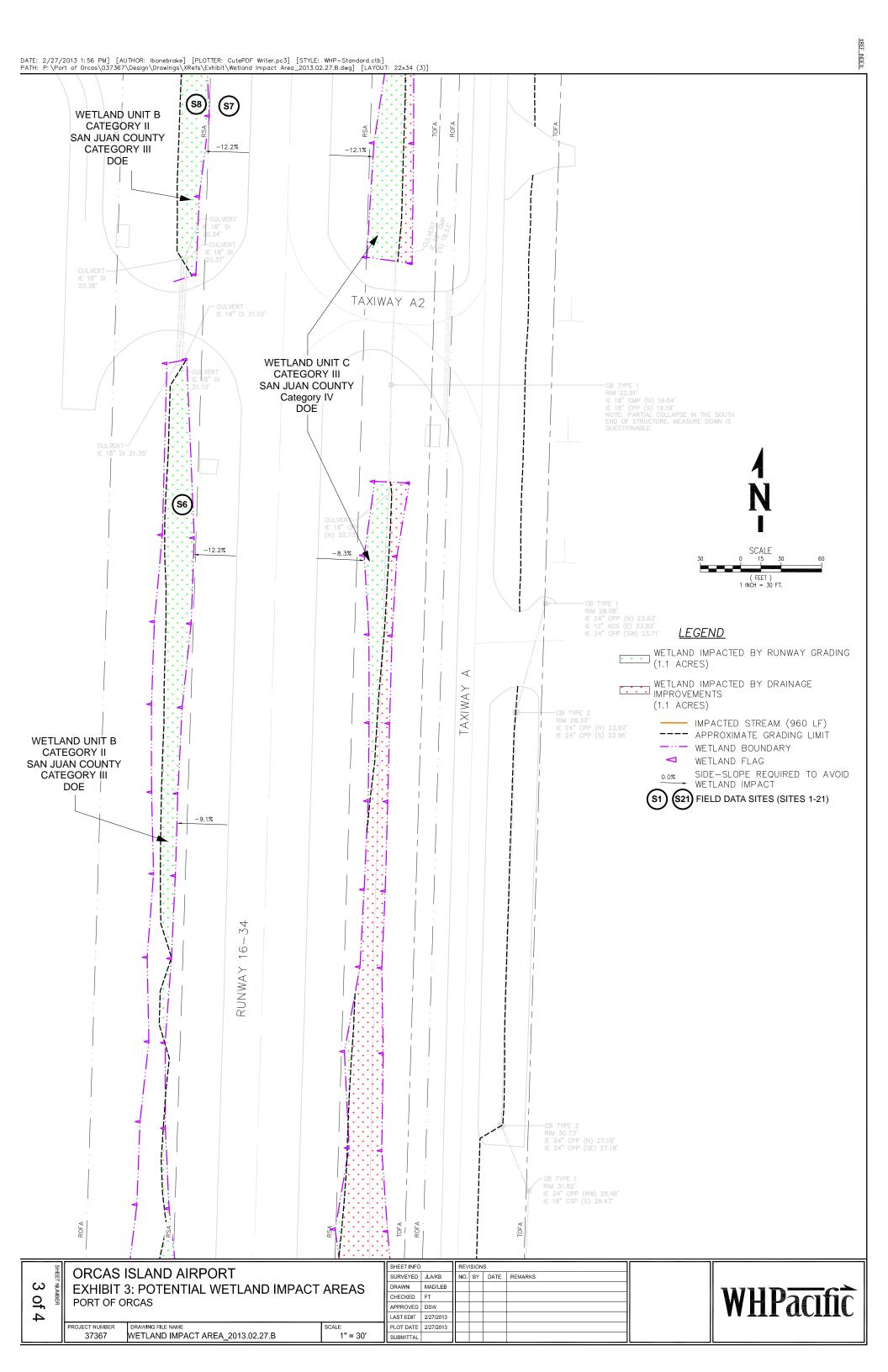
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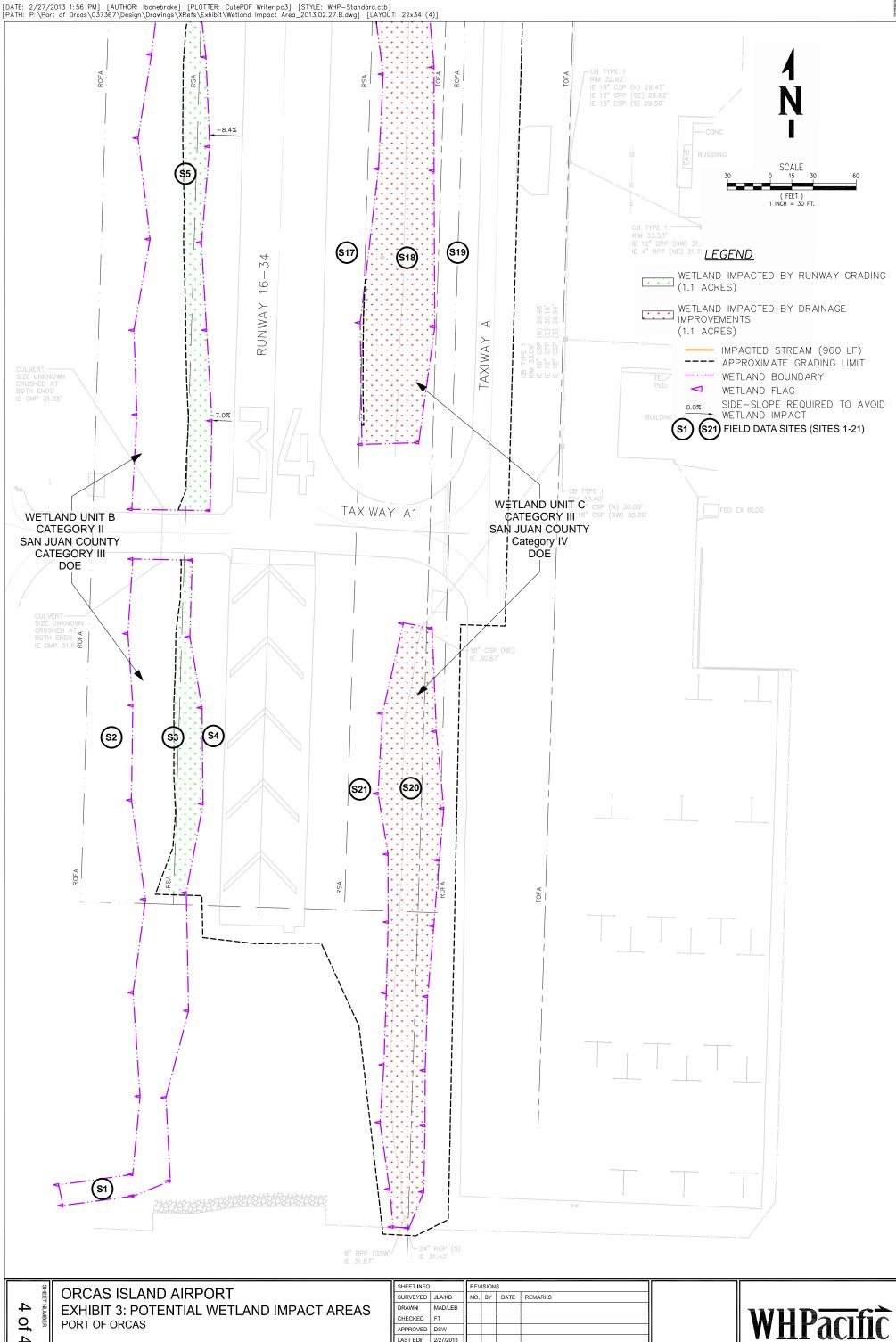
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PORT OF ORCAS

37367

WETLAND IMPACT AREA_2013.02.27.B





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WETLAND IMPACT AREA_2013.02.27.B

PROJECT NUMBER

SELECTING WETLAND MITIGATION SITES USING A WATERSHED APPROACH CHART 3 Q & A

Question 3A: Identify the watershed processes that have been altered within the hydrologic unit where the mitigation site is located.

Problems caused by altered watershed processes		No	In watershed plan?
in the hydrologic unit			
Increased flooding	X		No
Eutrophication in streams, rivers, and lakes		X	
Impaired water quality		X	
Erosion of streams and river banks that threaten		X	
human and natural resources			
Fragmentation and loss of habitat			No
Other (especially if noted in plan)			

Although San Juan County does have a *Watershed Management Action Plan* for several priority watersheds in the area, there is no existing watershed plan that specifically addresses the area containing the Orcas Island Airport.

Question 3B: Will the mitigation result in a wetland of the appropriate hydrogeomophic (HGM) class for the landscape setting?

Mitigation in the form of wetland creation and enhancement are proposed adjacent to and within existing functioning wetland areas. The creation area will be constructed adjacent to a wetland with a slope HGM class. No alterations are proposed that would change the HGM class.

Question 3C: Will the primary source of water to the mitigation site be appropriate for the HGM class?

For the Wetland Creation areas, the hydrologic source is a combination of groundwater and surface flows from precipitation and adjacent impervious surfaces. Within the enhancement area, the hydrologic source of water is a combination of high groundwater table and occasional flooding from tidal waters. The proposed mitigation areas will continue to have these primary sources of hydrology.

Question 3D: Will the site have an adequate supply of water to maintain a wetland without engineering the delivery of water that would require long term control or maintenance.

Groundwater within the existing wetland is noted to the surface during the early growing season on multiple locations throughout the mitigation site. In addition, seasonal ponding from surface flows are common.

Question 3E: Will the mitigation activities maintain hydric soils, if they exist, at the site?

Hydric soils will be imported to the creation area.

Hydric soils exist in the enhancement area. No hydric soils will be removed as part of the enhancement plan, so hydric soils are expected to be maintained in the mitigation area.

Question 3F: Can the mitigation be designed to control aggressive plant species?

The wetland enhancement measures have been specifically designed to control/reduce the presence of aggressive plant species. This will be achieved through combination of removal/control prior to planting, planting fast growing native trees and shrubs that tend to survive well in heavily competitive environments, by implementing a 10 year monitoring and maintenance program to ensure plant survival and aggressive species control, and by having a long-term management plan guaranteed by the home owners association.

Chart 2: Analyzing Potential Wetland Mitigation Sites Without a Watershed Plan

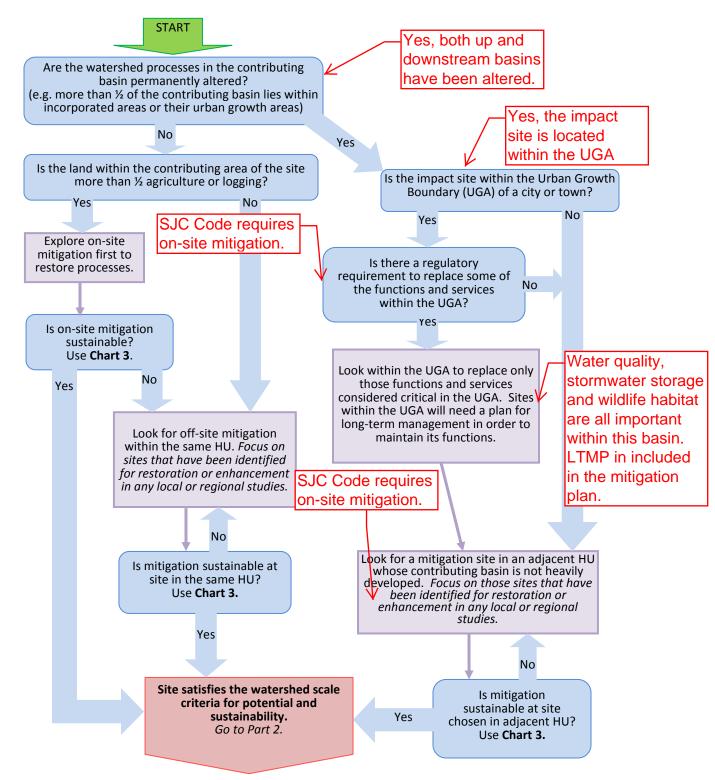


Chart 3: Analyzing the Potential of Sites to Provide Sustainable Mitigation in a Watershed Context

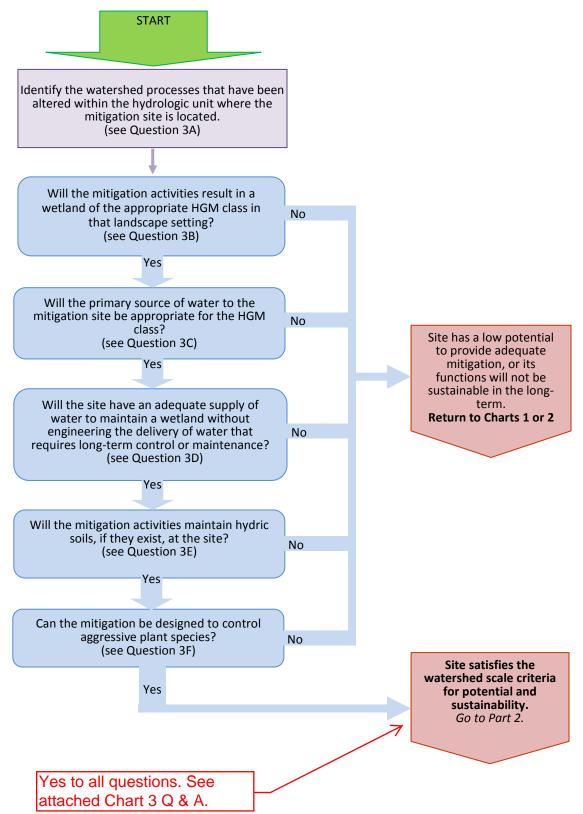
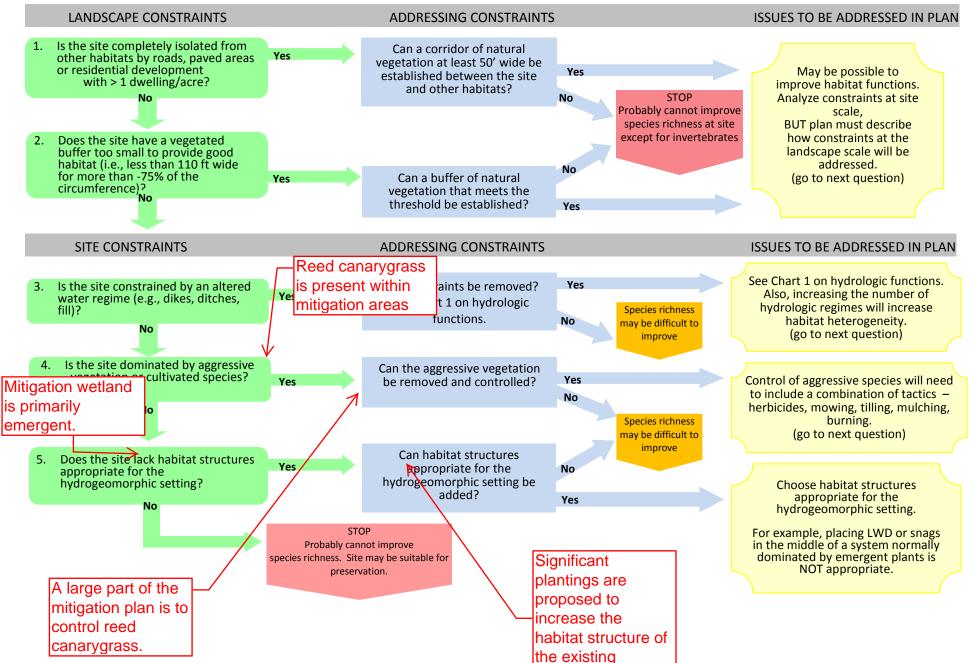


Chart 10: Goal - Improving Species Richness of Wildlife



wetland

APPENDIX B: DELINEATION REPORT

9505 19th Avenue S.E. Suite 106 Everett, Washington 98208 (425) 337-3174 Fax (425) 337-3045

DELINEATION REPORT

FOR

ORCAS ISLAND AIRPORT

Wetland Resources, Inc. Project #12225

Prepared By:

Wetland Resources, Inc. 9505 19th Ave. SE Suite 106 Everett, WA 98208 (425) 337-3174

For:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011

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REVIEW OF EXISTING INFORMATION	2
WETLAND AND STREAM CLASSIFICATIONS — COWARDIN SYSTEM	2
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APPENDIX 1: MAPS

- FIGURE 1: DATA SITE LOCATION MAP AIRPORT SITE
- FIGURE 2: DATA SITE LOCATION MAP SOUTH SITE
- FIGURE 3: NWI MAP
- FIGURE 4: SOIL SURVEY MAP

APPENDIX 2: DOE WETLAND RATING FORMS (WETLANDS A-D)

APPENDIX 3: WETLAND DETERMINATION DATA FORMS (SAMPLE SITES 1-26)

INTRODUCTION

The subject project area is on Orcas Island in the jurisdiction of San Juan County within a portions of Section 11 and 14, Township 37N, Range 2W, W.M. The project includes the following tax parcel numbers: 271412010000, 271412009000, 271412013000, 27114202300, and 271131001000. The Airport facility ("Airport Site") and adjacent mitigation area covers approximately 40 acres and is located at 147 Schoen Lane. The site south of airport ("South Site") covers almost 12 acres and has no address, but is bordered to the north by Mt. Baker Rd. and to the west by Lover's Ln., and can be accessed from either road.

Wetland Resources, Inc. (WRI) conducted several site visits, first to evaluate and verify previously delineated wetland boundaries in and around the tarmac of the Airport and proposed mitigation site, and then to conduct a wetland delineation on the property south of the Airport. The site visits were on November 7 and 8, 2012 and June 3, 2014.

Previously delineated wetland boundaries in and around the airport tarmac were readily discernable based on the presence of the wetland delineation flagging, or by measuring from known, surveyed points such as runway lights.

WRI identified four wetlands and three streams on the site. The identified wetlands on the site are labeled as Wetlands A, B, C, and D and the streams are labeled as Streams 1, 2, and 3. The on-site portions of Wetlands B and C are currently functioning as drainage swales. These wetlands function to store and convey much of the runoff from adjacent impervious surfaces.



Local Vicinity Map (source: www.google.com/maps)

Part of the Airport Site gently slopes to the north and the other part slopes to the south. The only noticeable variation in the surface topography is within the wetland swales. Surrounding land use is comprised of: the Airport, related commercial enterprises, single-family, and a small marina. The investigation area is defined by the vegetated areas between and adjacent to the tarmac. Vegetation is dominated with closely cropped grasses, consisting of: velvetgrass, bluegrass, bentgrass, and reed canarygrass with areas of water parsley, soft rush, and hardhack spirea.

The South Site is situated of a gentle south-facing aspect. Surrounding land use is comprised of: the Airport, related commercial enterprises, single-family residences, open space/conservation easement, and retail. Vegetation communities consist of periodically maintained field and forestlands. In the field, the vegetation consists of soft rush (Juncus effusus), taper-tip rush (Juncus acuminatus), redtop bentgrass (Agrostis, gigantia), velvet grass (Holcus lanatus), meadow foxtail (Alopocurus pratensis), and slough sedge (Carex obnupta). In the forested areas, dominant vegetation consists of Douglas fir (Pseudotsuga menziesii), black hawthorn (Crataegus douglasii), Nookta rose (Rosa nutkana), Himalayan blackberry (Rubus armeniucus), scot's broom (Cytisus scoparius), snowberry (Symphoricarpus albus), tall fescue (Festuca arundinacea), and field horsetail (Equicetum arvense).

The identified wetlands on the Airport Site are labeled as Wetlands A, B, and C. Based on observations, site topography, previous salinity tests and discussions with the WSDOE, Wetlands A, B, and C were historically two hydrogeomorphically distinct units, which WRI has broken into three wetland units for the purpose of this investigation. The northern unit is a tidally influenced peat wetland (Wetland A). The southwestern unit is a groundwater fed slope wetland (Wetland B). The central unit (Wetland C) is a groundwater and impervious surface fed, slope wetland in the median between the tarmac. The boundary between Wetland Units A and B is approximately halfway between wetland flags NEW19 and NEW20. The portions of Wetlands B and C that lie within the airport expansion site are currently functioning as drainage swales. These wetlands function to store and convey much of the runoff from adjacent impervious surfaces. In addition, two ditched streams are located within the boundary of the site. Stream 1 is a drainage ditch within the boundary of Wetland A, while Stream 2 originates off-site to the east and flows along the eastern property line. Please see the attached figures for a detailed location of the mapped wetland and stream units.

The identified wetland on South Site is labeled as Wetland D, which covers most of the pasture and forested areas of the South Site. Prior to development in the East Sound area, the wetland may have extended all the way to Fishing Bay. A ditched channel (Stream 3) through the on-site portion of this wetland appears to have been intentionally created several decades ago to control and convey the hydrology within the wetland for agricultural use. It shall be classified as a stream because it is conveying natural hydrology. The numerous blocks and lack of spawning habitat are indicators that this onsite stream would not be accessible nor suitable habitat for fish. WRI did not find any documented evidence that the stream supports fish habitat.

REVIEW OF EXISTING INFORMATION

Before conducting on-site investigations, a literature review was performed to identify records of wetlands within the project area. The following information was collected and examined:

- U.S. Geological Survey (USGS) topographic map of (USGS, on-line quadrangle maps)
- National Wetlands Inventory map of project area (online wetlands mapper found at http://137.227.242.85/wetland/wetland.html)

- Web Soils Survey (USDA, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)
- San Juan County Municipal Code, Chapter 18.30
- National List of Vascular Plant Species that Occur in Wetlands: 1996 National Summary Indicator by Region and Subregion (USFWS, March 2, 1997)

WETLAND AND STREAM CLASSIFICATIONS - COWARDIN SYSTEM

According to the Cowardin System, as described in Classification of Wetlands and Deepwater Habitats of the United States, the classifications for the on-site wetlands and streams are as follows:

Wetland A: Palustrine, Forested/Emergent, Irregularly Flooded

Wetlands B: Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

Wetlands C: Palustrine, Emergent, Persistent, Seasonally Flooded

Wetlands D: Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

Streams 1, 2 and 3: Riverine, Lower Perennial, Streambed, Mud

WETLAND AND STREAM CLASSIFICATIONS - DEPARTMENT OF ECOLOGY

Wetlands were rated according to the most current/revised version of the *Washington State Wetland Rating System for Western Washington: 2014 Update.* (Publication #14-06-029). Streams are classified according to WAC 222-16-030 and 222-16-031.

Wetland A - Category I

Wetland A was rated as a Riverine because it is a freshwater tidal system. Wetland A receives a total score of 24 points on the DOE Wetland Rating Form (2014), which equates to a Category I classification.

Wetland B - Category III

Wetland B is a Slope wetland and receives a total score of 18 points on the DOE Wetland Rating Form (2014), which equates to a Category III classification.

Wetland C - Category IV

Wetland C is a Slope Wetland and receives a total score of 14 points on the DOE Wetland Rating Form (2014), which equates to a Category IV classification.

Wetland D - Category III

Wetland D is a Depressional and receives a total score of 18 points on the DOE Wetland Rating Form (2014), which equates to a Category III classification.

Streams 1, 2, and 3

According to WAC 222-16-030 and 222-16-031, Streams 1, 2, and 3 all meet the criteria of Type Np (Type 4) streams. According to SJCC Chapter 18.30.160.E, the streams are dedicated 100-foot high intensity water quality buffers and 50-foot tree protection buffers.

Table 1 below summarizes the on-site wetland classifications using the various classification systems described above:

Table 1: Wetland Classification Summary

Wetland	Category (Cowardin)	Hydrogeomorphic Class (HGM)	Category (DOE/SJC)
A	PFOP	Riverine	Category I
В	PFOC	Slope	Category III
С	PEMC	Slope	Category IV
D	PFOC	Depressional	Category III

WETLAND DETERMINATION REPORT

Methodology

Wetland Resources' staff performed the field investigation to verify the previously delineated wetland boundaries using the routine methodology described in the 1987 Corps of Engineers Wetlands Delineation Manual and the U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (May 2010). Wetlands were evaluated on and within 200 feet of the subject property. In general, the wetland boundary verification consisted of two tasks: (1) assessing vegetation, soil, and hydrologic characteristics to identify areas meeting the wetland identification criteria, and (2) recording the observations on field data forms.

The process for making a wetland determination is based on three sequential steps:

- 1) Examination of the site for hydrophytic vegetation (species present and percentage cover).
- 2) If hydrophytic vegetation is found, then the presence of hydric soils is determined.
- 3) Determination of the presence of wetland hydrology in the area examined under the first two steps.

Vegetation Criteria

The 2010 Regional Supplement defines hydrophytic vegetation as "assemblage of macrophytes that occurs in areas where inundation or soil saturation is either permanent or have sufficient frequency and duration to influence plant occurrence." Field indicators were used to determine whether the vegetation meets the definition for hydrophytic vegetation.

Wetland Soils Criteria and Mapped Description

The 2010 Regional Supplement defines hydric soils as "soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Field indicators were used to determine whether a given soil meets the definition for hydric soils.

The USDA Natural Resources Conservation Service (NRCS) has mapped the underlying soils associated with this site as Sholander-Spieden complex (0 to 5 percent slope) and Shalcar muck (0 to 2 percent slopes).

Sholander-Spieden complex soil unit is a mix of Scolander and Spieden soils. The Sholander soil formed in valleys, is 40-60 inches thick above the restrictive layers and is somewhat poorly drained. The typical profile of a Sholander soil unit is gravelly loam in the upper 8 inches over gravelly sandy loam and gravelly loamy sand. The Spieden soil formed in drainageways. It is more than 80 inches

thick above a restrictive layer and is poorly drained. The typical profile of a Spieden soil is approximately 4 inches of mucky silt loam over silt loam from approximately 4-11 inches below the surface and gravelly loamy sand below 11 inches.

Shalcar muck soil formed in depressions. It is a deep, very poorly drained soil comprised of highly decomposed plant material over glacial outwash. The upper 22 inches of the Shalcar muck soil unit profile consist of muck. Sublayers consist of fine sandy loam and silt loam. The Shalcar muck soil unit is listed as a hydric soil.

Wetland Hydrology Criteria

Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively.

Additionally, areas which are seasonally inundated and/or saturated to the surface for a consecutive number of days ≥ 12.5 percent of the growing season are wetlands, provided the soil and vegetation parameters are met. Areas inundated or saturated between five and 12.5 percent of the growing season in most years may or may not be wetlands. Areas saturated to the surface for less than five percent of the growing season are non-wetlands. Field indicators were used to determine whether wetland hydrology parameters were met on this site.

BOUNDARY DETERMINATION FINDINGS

The previously delineated boundaries of Wetlands A, B, and C have been deemed accurate with very minor changes. Boundary differences observed during the WRI investigation were very minor and are likely a result of climactic conditions at the time of investigation. Due to this, no changes are recommended to the surveyed wetland boundary. Wetland D, located in the parcel south of the airport, had not been previously delineated. Therefore, WRI identified and delineated the boundaries of this wetland within the Port property in June 2014. The following describes existing conditions of Wetlands A, B and C November 2012 and Wetland D in June 2014.

On-site Wetlands Wetland A

Wetland A is large tidally influenced peat wetland that extends mostly off-site to the west of the airport runway. It contains Shalcar-Muck soils; and although it is considered a peat wetland, it does not contain plant species typical of peat wetlands. The on-site portion of Wetland A contains reed canarygrass (*Phalaris arundinacea*, FacW), slough sedge (*Carex obnupta*, Obl), and annual bluegrass (*Poa annua*, Fac). Off-site, this wetland consists of forested, shrub, and emergent vegetation, including the following: red alder (*Alnus rubra*, Fac), hardhack (*Sprirea douglasii*, FacW), Nootka rose (*Rosa nutkana*, Fac), black hawthorn (*Crataegus douglasii*, Fac), slough sedge (*Carex obnupta*, Obl), Green saltgrass (*Distichlis spicata*), and reed canarygrass (*Phalaris arundinacea*, FacW).

The soils underlying the investigated on-site portion of the wetland are black (10YR 2/1) and very dark gray (10YR 3/1) silt loam with dark yellowish brown (10YR 4/4) redoximorphic features. The soils were saturated to the surface at the time of the site investigation in November 2012.

Wetland B

Wetland B is vegetated with herbaceous species, including the following: common velvet grass (*Holcus lanatus*, Fac), water parsley (*Oenanthe sarmentosa*, Obl), soft rush (*Juncus effusus*, FacW), dagger leaf rush (*Juncus ensifolius*, FacW), taper-tip rush (*Juncus acuminatus*, Obl), golden-eyed grass (*Sisyrinchium californicum*, FacW), and annual bluegrass (*Poa annua*, Fac).

The soils underlying Wetland B are variable, but typically represented by very dark brown (10YR 2/2) organic sandy loam in the upper 4 inches with dark gray (10YR 4/1) loamy sand in the sub-layers to approximately 18 inches below the surface. The soils were moist to saturated at the time of the site visit. Seepage within the upper 12 inches of the surface was identified in most of the soil pits dug in the wetland areas.

Wetland C

Wetland C is vegetated with herbaceous species, including the following: common velvet grass (*Holcus lanatus*, Fac), water parsley (*Oenanthe samentosa*, Obl), soft rush (*Juncus effusus*, FacW), dagger leaf (*Juncus ensifolius*, FacW), taper-tip rush (*Juncus acuminatus*, Obl), golden-eyed grass (*Sisyrinchium californicum*, FacW), and annual bluegrass (*Poa annua*, Fac).

The soils underlaying Wetland C are dark grayish brown (2.5Y 4/2) sandy loam with dark yellowish brown (10YR 4/6) redox features and a texture of sandy loam. Other soil colors include dark gray (10YR 4/1) with dark yellowish brown (10YR 3/6) loamy sand in the upper 18 inches. The soils were moist to saturated at the time of the site visit. Seepage within the upper 12 inches of the surface was identified in most of the soil pits dug in the wetland areas.

Wetland D

Wetland D contains a periodically maintained grass field as well as a forested component. In the field, the vegetation consists of soft rush (Juncus effusus, FacW), taper-tip rush (Juncus acuminatus, FacW), redtop bentgrass (Agrostis, gigantia, Fac), velvet grass (Holcus lanatus, Fac), meadow foxtail (Alopocurus pratensis, FacW), and slough sedge (Carex obnupta, Obl). In the forested areas, dominant vegetation consists of Red alder (Alnus rubra, Fac), black hawthorn (Crataegus douglasii, Fac), Nookta rose (Rosa nutkana, FacU), Himalayan blackberry (Rubus armeniucus, FacU), and slough sedge.

The soils underlying the areas mapped as Wetland D are typically black (10 YR 2/1) to very dark grayish brown (10YR 3/1) with dark brown (10YR 3/3) and dark yellowish brown (10YR 4/4) redoximorphic features. The soil textures found were loam and sandy loam. The soils were moist to saturated in the upper 18 inches.

Generally, positive hydrology indicators for all areas mapped as wetlands on this site included: saturation to the surface (primary indicator), as well as drainage patterns, saturation visible on aerial images, containing a dominance of plant species with indicators of Fac or wetter. Based on the field indicators found on the site, it appears that the areas mapped as wetlands are saturated to the surface for more than 12.5 percent of the growing season, thereby fulfilling wetland hydrology criteria.

Non-Wetland Areas

The non-wetland areas on adjacent to the airport runway are dominated by velvet grass (*Holcus lanatus*, Fac), red clover (*Trifolium pretense*, FacU), annual bluegrass (*Poa annua*, Fac), bentgrass (*Agrostis tenuis*, Fac), orchard grass (*Dactylis glomerata*, FacU), and Common dandelion (*Taraxacum officinale*, FacU).

In the non-wetland areas of the Port property south of the airport runway, dominant vegetation consists of Douglas fir (*Pseudotsuga menziesii*, FacU), black hawthorn (*Crataegus douglasii*, Fac), Nookta rose (*Rosa nutkana*, Fac), Himalayan blackberry (*Rubus armeniucus*, FacU), scot's broom (*Cytisus scoparius*, Upl), snowberry (*Symphoricarpus albus*, FacU), tall fescue (*Festuca arundinacea*, FacU), and field horsetail (*Equicetum arvense*, Fac).

The soils underlying the areas identified as non-wetland areas on the site are variable and generally include Munsell colors of very dark grayish brown (2.5Y 3/2) very dark brown (10YR 2/2), dark grayish brown 10YR 4/2, very dark grayish brown (10YR 3/2), brown 10YR 4/3, dark grayish brown (10YR 2/2), and yellowish brown (10YR 4/4). The soil textures within the non-wetland areas are typically loamy sand, sandy loam, and fine sandy loam.

No significant redoximorphic features, which indicate reducing conditions, were identified in in the non-wetland soils. No saturation or any other hydrology indicators were identified within these areas. Based on the lack of field indicators, it appears that areas of the site mapped as non-wetland are not saturated to the surface for more than 12.5 percent of the growing season, thereby not fulfilling wetland hydrology criteria.

FUNCTIONS AND VALUES ASSESSMENT

Methodology

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretations. This assessment pertains specifically to the on-site wetland systems, but is typical for assessments of similar systems common to western Washington.

Functions and Values Components

Wetlands in western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater control, water quality improvement, fish and wildlife habitat, aesthetic value, recreational opportunities, and education. The most commonly assessed functions are Stormwater Storage/Flood flow Attenuation, Water Quality, and Wildlife Habitat. Assessments of these functions for the project site are provided below.

Existing Conditions

Wetland A

Wetland A covers more than 20 acres of land and includes forested, shrub, and emergent vegetation classes. The wetland appears to have been significantly altered several decades ago. The stream flowing through Wetland A has been ditched; and vegetation throughout the wetland has been historically cleared and reestablished (based on Google Earth images).

Most of this wetland is tidally influenced and dominated by emergent vegetation. It is comprised of peat soils (Shalcar Muck). Organic soils, such as the Shalcar Muck soil series mapped on this site, function to control flooding and absorb excess pollutants in the surface waters.

The diverse habitat types and special features in and surrounding this wetland affords this wetland a moderately high habitat score. Based on these existing conditions, this wetland is expected to provide valuable habitat for a variety of bird species. Additionally, there is evidence of use by dear, rabbits, and a variety of other small mammals and rodents.

Overall, Wetland A offers moderately high levels of typical wetland functions and values. Due to is altered condition and established invasive species, there appears to be potential to improve the level of functions within this wetland through vegetation enhancement.

Wetland B

Wetland B is a slope wetland located immediately along the west side of the airport runway. The main body of Wetland B extends off-site to the west into an immature forested vegetation class. The on-site portion of Wetland B consists of maintained (mowed) emergent vegetation. This wetland receives its hydrology from a high groundwater table as well as from surface runoff. The level of habitat within this wetland is moderate, due to the moderate plant diversity and vertical structure within the off-site portions. However the on-site emergent portion of this wetland severely limited levels of habitat function, due to its proximity to airplane traffic. Based on existing conditions, this wetland received moderately low scores for typical wetland scores on the DOE wetland Rating form.

Wetland C

Wetland C is a slope wetland located in the median between the taxiway and the runway of the airport. It is comprised of maintained emergent vegetation. This wetland receives its hydrology from a high groundwater table as well as from surface runoff from the paved airport runway, although there is little evidence of significant ponding for long periods within this wetland. This wetland is isolated from other diverse habitats by surrounding paved areas. Thus, potential habitat functions are severely limited. Based on existing conditions, this wetland received moderately low scores for typical wetland scores on the DOE wetland Rating form.

Wetland D

Wetland D was historically part of a larger wetland complex that extends off-site to the south. It is classified as a depressional, forested wetland. Prior to development in the East Sound area, the wetland may have extended all the way to Fishing Bay, located within 1/2 mile south of the site. The wetland contains a ditched channel, which was constructed for agricultural use many decades ago to control and convey the hydrology within the wetland. Wetland D has moderate potential for hydrologic control and water quality improvement functions, as evidenced by its scores for these functions on the DOE wetland rating form. Wetland D receives a low score of 16 points for habitat functions because it contains forested habitat with special habitat features and multiple water regimes.

Based on existing conditions Wetland A offers moderate levels of typical wetland functions and values. Due to its altered condition of the maintained field component of this wetland, there are potential opportunities to enhance this wetland with native vegetation.

USE OF THIS REPORT

This Critical Area Study and Mitigation Plan is supplied to WH Pacific as a means of determining onsite wetland conditions and protection requirements as part of the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions. Reports may be adversely affected due to the physical condition of the site and the difficulty of access that may lead to observation or probing difficulties.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect. The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Andrea Bachman, PWS Senior Ecologist Scott Brainard, PWS Principal Wetland Ecologist

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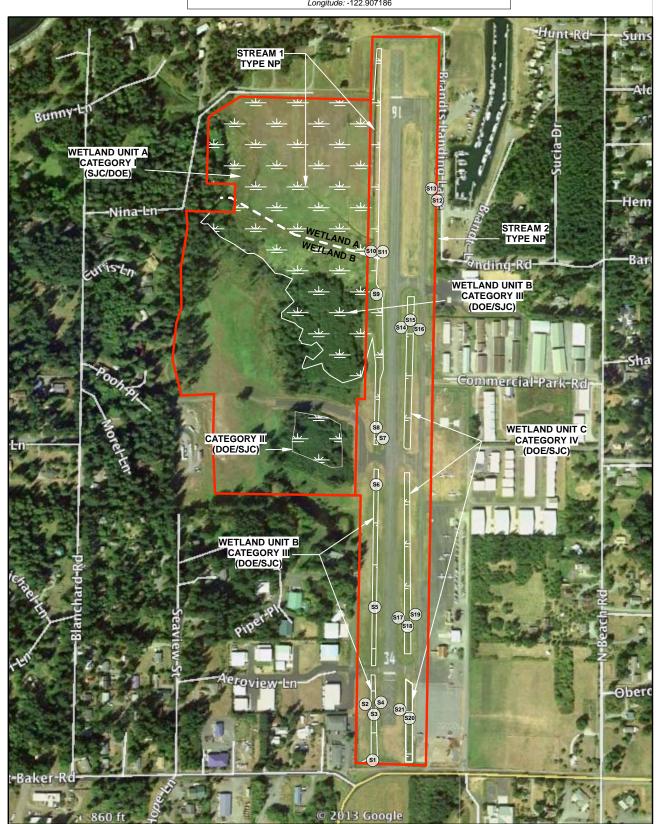
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Web Soils Survey (USDA, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)

APPENDIX 1: MAPS

- FIGURE 1: WETLAND RATING & DATA SITE LOCATION MAP AIRPORT SITE
- FIGURE 2: WETLAND RATING & DATA SITE LOCATION MAP SOUTH SITE
- FIGURE 3: NWI MAP
- FIGURE 4: SOIL SURVEY MAP

FIGURE 1: DATA SITE LOCATION MAP - AIRPORT SITE ORCAS ISLAND AIRPORT Section 11, Township 37N, Range 2W, W.M. Latitude: 48.706192 Longitude: -122.907186





LEGEND (\$1)—(\$21) FIELD DATA SITES 1-21 PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

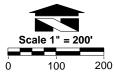
AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure 1 DATE: May 2015

FIGURE 2: DATA SITE LOCATION MAP - SOUTH SITE ORCAS ISLAND AIRPORT Section 11, Township 37N, Range 2W, W.M.

ection 11, Township 37N, Range 2W, W.M. *Latitude:* 48.706192 *Longitude:* -122.907186





LEGEND

S22 — S26 FIELD DATA SITES 22-26

PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure 2

Figure 2 DATE: May 2015



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons



Soil Map Unit Lines



Soil Map Unit Points

Special Point Features

Blowout



Clay Spot

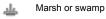
Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow



Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline SpotSandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot



Very Stony Spot



Wet Spot Other



Special Line Features

Water Features

Streams and Canals

Rails

Transportation

Interstate Highways



J



US Routes
Major Roads



Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Juan County, Washington Survey Area Data: Version 15, Sep 2, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 9, 2010—Aug 28, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

	San Juan County, Washington (WA055)				
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI		
1000	Sholander-Spieden complex, 0 to 5 percent slopes	36.8	50.1%		
1005	Shalcar muck, 0 to 2 percent slopes	22.5	30.7%		
1010	Deadmanbay-Morancreek complex, 2 to 15 percent slopes	3.0	4.0%		
2008	Mitchellbay-Sholander-Bazal complex, 0 to 8 percent slopes	3.5	4.8%		
2011	Roche-Killebrew complex, 2 to 10 percent slopes	0.6	0.8%		
3013	Everett sandy loam, warm, 3 to 20 percent slopes	7.0	9.5%		
Totals for Area of Interest		73.4	100.0%		



NWI Map for Orcas Island Airport

Freshwater Emergent Freshwater Forested/Shrub Estuarine and Marine Deepwater

Estuarine and Marine

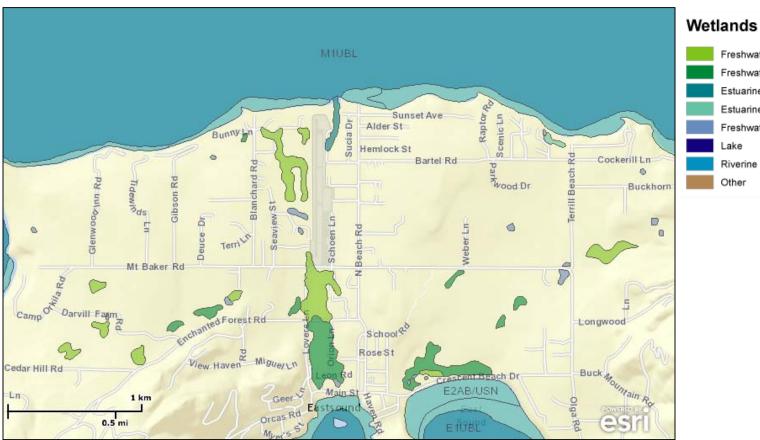
Freshwater Pond

Lake

Other

Riverine

Oct 30, 2014



This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on

User Remarks:

APPENDIX 2: 2014 REVISED DOE WETLAND RATING FORMS AND FIGURES

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Dreas Angest - Wetlandf Date of	site visit: 11/8/12	
Name of wetland (or ID #): <u>DVEGS ANDOVE - WETGGAGT</u> Date of search by ABSB Trained by Ecology? YesNo	o Date of training 💈	2010
HGM Class used for rating Riverine Wetland has multiple HGM	l classes?YI	N
NOTE: Form is not complete without the figures requested (figures of Source of base aerial photo/map <u>Google</u> , SJC Pola		
OVERALL WETLAND CATEGORY (based on functions or specific	ecial characteristics_)
1. Category of wetland based on FUNCTIONS		
 Category of wetland based on FUNCTIONS Category I – Total score = 23 - 27 	Score for each	7
Category II - Total score = 20 - 22	function based	
Category III — Total score = 16 - 19	on three ratings	\.,

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	_	Circle the ap	propriate ratings	
Site Potential	H M L	H) M L	H (M) L	
Landscape Potential	H M L	H) M L	H M L	1
Value	H M L	H (M) L	H M L	TOTAL
Score Based on Ratings	6	8	8	24

Category IV - Total score = 9 - 15

Score for each function based on three ratings (order of ratings is not important)

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I (II)
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	



Maps and figures required to answer questions correctly for Western Washington

<u>Depressional Wetlands</u>

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	AI
Hydroperiods	H 1.2	BI
Ponded depressions	R 1.1	BI
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	Ci
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	AI
Width of unit vs. width of stream (can be added to another figure)	R 4.1	Al
Map of the contributing basin	R 2.2, R 2.3, R 5.2	E
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	CI
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	12
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	D

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

	questions 1-7 apply, and go	to Question 8.	
1.	Are the water levels in th	e entire unit usually contro	lled by tides except during floods?
	NO- go to 2	YES – the w	etland class is Tidal Fringe – go to 1.1
-	1.1 Is the salinity of the wa	ter during periods of annua	l low flow below 0.5 ppt (parts per thousand)?
		lassified as a Freshwater Tid e it is an Estuarine wetland	YES – Freshwater Tidal Fringe lal Fringe use the forms for Riverine wetlands. If it and is not scored. This method cannot be used to
2.		s flat and precipitation is th are NOT sources of water to	e only source (>90%) of water to it. Groundwater to the unit.
	NO- go to 3 If your wetland can be cla	ssified as a Flats wetland, us	YES – The wetland class is Flats se the form for Depressional wetlands.
3.	The vegetated part of t plants on the surface a	nit meet all of the followin he wetland is on the shores t any time of the year) at lea en water area is deeper than	of a body of permanent open water (without any ast 20 ac (8 ha) in size;
	NO go to 4	YES – The wetland cl	ass is Lake Fringe (Lacustrine Fringe)
4.	The wetland is on a slow The water flows throuseps. It may flow sub		ual), ction (unidirectional) and usually comes from a swale without distinct banks,
	NO – go to 5		(YES) The wetland class is Slope
			wetlands except occasionally in very small and ons are usually <3 ft diameter and less than 1 ft
5.	The unit is in a valley, stream or river,	nit meet all of the followin or stream channel, where i g occurs at least once every	t gets inundated by overbank flooding from that

Wetland name or number _____

NO - go to 6

(YES) The wetland class is Riverine

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO - go to 7

YES - The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit	HGM class to
being rated	use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

DEPRESSIONAL AND FLATS WETLANDS
Water Quality Functions - Indicators that the site functions to improve water quality
D 1.0. Does the site have the potential to improve water quality?
D 1.1. Characteristics of surface water outflows from the wetland:
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):
Wetland has persistent, ungrazed, plants > 95% of area points = 5
Wetland has persistent, ungrazed, plants > ½ of area points = 3
Wetland has persistent, ungrazed plants $> \frac{1}{10}$ of area points = 1
Wetland has persistent, ungrazed plants $<^1/_{10}$ of area points = 0
D 1.4. Characteristics of seasonal ponding or inundation: This is the area that is ponded for at least 2 months. See description in manual. Area seasonally pended is > 1/2 total area of wetland points = 4
Alea seasonally politica is 7/2 total alea of Mediana
Area seasonally portion to 74 total area of working
Area seasonally portion is 4% total area of troublets
Total for D 1 Add the points in the boxes above
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L Record the rating on the first page
D 2.0. Does the landscape have the potential to support the water quality function of the site? D 3.1. Does the watland unit receive stormwater discharges? Yes = 1 No = 0
D 2.1. Does the wettallu ulit receive storiliwater discharges.
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0
D 2.3. Are there septic systems within 250 ft of the wetland?
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source Yes = 1 No = 0
Total for D 2 Add the points in the boxes above
Rating of Landscape Potential If score is:3 or 4 = H1 or 2 = M0 = L
D 3.0. Is the water quality improvement provided by the site valuable to society:
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (answer YES if there is a TMDL for the basin in which the unit is found)? Yes = 2 No = 0
Total for D 3 Add the points in the boxes above
Rating of Value If score is:2-4 = H1 = M0 = L Record the rating on the first page

<u>DEPRESSIONAL AND FLATS WETLANDS</u> Hydrologic Functions - Indicators that the site functions to reduce flooding	and stroom down dati
D 4.0. Does the site have the potential to reduce flooding and erosion?	and stream degradation
D 4.1. Characteristics of surface water outflows from the wetland:	
Wetland is a depression or flat depression with no surface water leaving it (no outlet) Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently	points = 4 y flowing outletpoints = 2
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing	ditch points = 1
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently fl	
D 4.2. <u>Depth of storage during wet periods:</u> Estimate the height of ponding above the bottom of with no outlet, measure from the surface of permanent water or if dry, the deepest part.	the outlet. For wetlands
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet The wetland is a "headwater" wetland	points = 3
Wetland is flat but has small depressions on the surface that trap water	points = 3
Marks of ponding less than 0.5 ft (6 in)	points = 1
	points = 0
D 4.3. <u>Contribution of the wetland to storage in the watershed</u> : <i>Estimate the ratio of the area of a contributing surface water to the wetland to the area of the wetland unit itself.</i>	
The area of the basin is less than 10 times the area of the unit The area of the basin is 10 to 100 times the area of the unit	points = 5
The area of the basin is note than 100 times the area of the unit The area of the basin is more than 100 times the area of the unit	points = 3
Entire wetland is in the Flats class	points = 0
	points = 5
Add the points	in the boxes above
	Record the rating on the first page
D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	?
D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human la >1 residence/ac, urban, commercial, agriculture, etc.)?	and uses (residential at Yes = 1 No = 0
Table	in the boxes above
	Record the rating on the first page
D 6.0. Are the hydrologic functions provided by the site valuable to society?	માં તાલું કે પ્રાથમ કે પ્રાથમ કર્યો કે પાકારી તાલું કે કે પ્યાપ્ત કરવા છે. તાલું માના કાર્યાના કાર્યા
D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best mate the wetland unit being rated. Do not add points. Choose the highest score if more than one The wetland captures surface water that would otherwise flow down-gradient into areas w	condition is met.
 damaged human or natural resources (e.g., houses or salmon redds): Flooding occurs in a sub-basin that is immediately down-gradient of unit. 	
Surface flooding problems are in a sub-basin farther down-gradient.	points = 2 points = 1
Flooding from groundwater is an issue in the sub-basin.	points = 1
The existing or potential outflow from the wetland is so constrained by human or natural co	· •
water stored by the wetland cannot reach areas that flood. Explain why	points = 0
There are no problems with flooding downstream of the wetland.	points = 0
O 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional	I flood control plan? Yes = 2 No = 0
Fotal for D 6	
Pating of Value If soons in 2.4.11.4.14.20.1	n the boxes above
Rating of Value If score is:2-4 = H1 = M0 = L	Record the rating on the first page

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS	a disense a la Pari
Water Quality Functions - Indicators that the site functions to improve water quality	
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:	
Depressions cover > 3/4 area of wetland points = 8	
Depressions cover > $\frac{1}{2}$ area of wetland points = 4	
Depressions present but cover < ½ area of wetland points = 2	2
No depressions present points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes)	
Trees or shrubs > $^2/_3$ area of the wetland points = 8	
Trees or shrubs > $\frac{1}{3}$ area of the wetland points = 6	
Herbaceous plants (> 6 in high) > $^2/_3$ area of the wetland points = 6	6
Herbaceous plants (> 6 in high) > $\frac{1}{3}$ area of the wetland points = 3	
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland points = 0	
Total for R 1 Add the points in the boxes above	8
Rating of Site Potential If score is: 12-16 = H 6-11 M 0-5 = L Record the rating on the	ne first page
R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? $(Yes = 2)$ No = 0	2
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? $(es = 1)$ No = 0	1
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 (No = 0)	0
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1000 No = 100	1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources Yes = 1 (No = 0)	0
Total for R 2 Add the points in the boxes above	4
Rating of Landscape Potential If score is: \(\sumsymbol{2} 3-6 = H \) 1 or 2 = M \(\sumsymbol{0} = L \) Record the rating on the score is: \(\sumsymbol{0} 3 - 6 = H \) 1 or 2 = M \(\sumsymbol{0} = L \)	ne first page
R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?	
Yes = 1 (No = 0)	\bigcirc
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 $No = 0$	0
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (answer YES if there is a TMDL for the drainage in which the unit is found) Yes = 2 (No = 0)	0
Total for R 3 Add the points in the boxes above	0
Rating of Value If score is: 2-4 = H 1 = M 1 = M 0 = L Record the rating on the	ne first page

MHL

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS	
Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosio R 4.0. Does the site have the potential to reduce flooding and erosion?	n ee ee
R 4.1. Characteristics of the overbank storage the wetland provides:	
Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).	
If the ratio is more than 20 If the ratio is 10-20 If the ratio is 5-<10 If the ratio is 1-<5 points = 9 points = 6 points = 4 points = 2	9
If the ratio is < 1 points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes). Forest or shrub for > \frac{1}{3} area OR emergent plants > \frac{2}{3} area Forest or shrub for > \frac{1}{10} area OR emergent plants > \frac{1}{3} area Plants do not meet above criteria	7
Total for R 4 Add the points in the hoves above	17.
Rating of Site Potential If score is: V12-16 = H6-11 = M0-5 = L Record the rating on the R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	ne first page
R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = $0 \text{ No} = 1$	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 No = 0	1
R 5.3. Is the up-gradient stream or river controlled by dams? Yes = $0 (No = 1)$	1
Total for R 5 Add the points in the boxes above	3
Rating of Landscape Potential If score is: \(\sum 3 = H \) 1 or 2 = M \(\sum 0 = L \) Record the rating on the	e first page
R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	1
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control-plan? Yes = $2 \text{ No} = 9$	0
Total for R 6 Add the points in the boxes above	
Rating of Value If score is: 2-4 = H \	- 6

HHM

LAKE FRINGE WETLANDS	
Water Quality Functions - Indicators that the site functions to L 1.0. Does the site have the potential to improve water quality?	o improve water quality
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes):	
Plants are more than 33 ft (10 m) wide	points = 6
Plants are more than 16 ft (5 m) wide and <33 ft Plants are more than 6 ft (2 m) wide and <16 ft	points = 3
Plants are less than 6 ft wide	points = 1
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that	points = 0
points, and do not include any open water in your estimate of coverage. The herbathe dominant form or as an understory in a shrub or forest community. These are not cover is total cover in the unit, but it can be in patches. Herbaceous does not include Cover of herbaceous plants is >90% of the vegetated area Cover of herbaceous plants is $>^2/_3$ of the vegetated area	aceous plants can be either not Cowardin classes. Area ude aquatic bed. points = 6 points = 4
Cover of herbaceous plants is $> \frac{1}{3}$ of the vegetated area	points = 3
Other plants that are not aquatic bed > $^{2}/_{3}$ unit	points = 3
Other plants that are not aquatic bed in $> \frac{1}{3}$ vegetated area	points = 1
Aquatic bed plants and open water cover > 2/3 of the unit	points = 0
Total for L 1 Add the Rating of Site Potential If score is: 8-12 = H 4-7 = M 0-3 = L	points in the boxes above Record the rating on the first page
L 2.0. Does the landscape have the potential to support the water quality function	of the site?
L 2.1. Is the lake used by power boats?	Yes = 1 No = 0
L 2.2. Is $>$ 10% of the area within 150 ft of wetland unit on the upland side in land uses tha	t generate pollutants? Yes = 1 No = 0
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as mi	ilfoil? Yes = 1 No = 0
Total for L 2 Add the	points in the boxes above
Rating of Landscape Potential: If score is:2 or 3 = H1 = M0 = L	Record the rating on the first page
L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource 303(d) list)?	Yes = 1 No = 0
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining if there is a TMDL for the lake or basin in which the unit is found.	g water quality? <i>Answer YES</i> Yes = 2 No = 0
Total for L 3 Add the	points in the boxes above
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the rating on the first page

<u>LAKE FRINGE WETLANDS</u>		
Hydrologic Functions - Indicators that the wetland unit functions to	reduce shoreline eros	ion
L 4.0. Does the site have the potential to reduce shoreline erosion?		
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do no <i>Choose the highest scoring description that matches conditions in the wetland.</i>	t include Aquatic bed):	
> ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 6	
> ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide	points = 4	
> 1/4 distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 4	
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)	points = 2	
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)	points = 0	
Rating of Site Potential: If score is:6 = M0-5 = L	Record the rating on	the first page
L 5.0. Does the landscape have the potential to support the hydrologic functions of th	ne site?	
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0	
Total for L 5 Add the poi	nts in the boxes above	
Rating of Landscape Potential If score is:2 = H1 = M0 = L	Record the rating on	the first page
L 6.0. Are the hydrologic functions provided by the site valuable to society?		
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one choose the one with the highest score.	resource is present,	
There are human structures or old growth/mature forests within 25 ft of OHWM of the	shore in the unit	
	points = 2	
There are nature trails or other paths and recreational activities within 25 ft of OHWM	points = 1	

Rating of Value: If score is:___2 = H ___1 = M ___0 = L

Other resources that could be impacted by erosion

There are no resources that can be impacted by erosion along the shores of the unit

Record the rating on the first page

points = 1

points = 0

NOTES and FIELD OBSERVATIONS:

SLOPE WETLANDS Water Quality Functions - Indicators that the site functions	tions to improve water quality
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vo 100 ft of horizontal distance)	ertical drop in elevation for every
Slope is 1% or less	points = 3
Slope is > 1%-2%	points = 2
Slope is > 2%-5%	points = 1
Slope is greater than 5%	points = 0
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutan Choose the points appropriate for the description that best fits the plants in have trouble seeing the soil surface (>75% cover), and uncut means not graz than 6 in. Dense, uncut, herbaceous plants > 90% of the wetland area	the wetland. <i>Dense means you</i>
Dense, uncut, herbaceous plants > ½ of area	points = 3
Dense, woody, plants > ½ of area	points = 2
Dense, uncut, herbaceous plants > ¼ of area	points = 1
Does not meet any of the criteria above for plants	points = 0
Total for S 1	Add the points in the boxes above
Rating of Site Potential If score is:12 = H6-11 = M0-5 = L	Record the rating on the first pag
S 2.0. Does the landscape have the potential to support the water quality for	unction of the site?
S 2.1. Is $>$ 10% of the area within 150 ft on the uphill side of the wetland in land us	Yes = 1 No = 0
S 2.2. Are there other sources of pollutants coming into the wetland that are not list. Other sources	sted in question S 2.1? Yes = 1 No = 0
Total for S 2	Add the points in the boxes above
Rating of Landscape Potential If score is:1-2 = M0 = L	Record the rating on the first pag
S 3.0. Is the water quality improvement provided by the site valuable to so	ciety?
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, 303(d) list?	Yes = 1 No = 0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At leas on the 303(d) list.	Yes = 1 No = 0
S 3.3. Has the site been identified in a watershed or local plan as important for mai if there is a TMDL for the basin in which unit is found.	ntaining water quality? <i>Answer YES</i> Yes = 2 No = 0
Total for S 3	Add the points in the boxes above
Rating of Value If score is: 2-4 = H 1 = M 0 = I	Posard the rating on the first age

Wetland name or number <u>A</u>

SLOPE WETLANDS	
Hydrologic Functions - Indicators that the site functions to reduce flo	oding and stream erosion
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose for the description that best fits conditions in the wetland. Stems of plants should be the in), or dense enough, to remain erect during surface flows.	
Dense, uncut, rigid plants cover > 90% of the area of the wetland	points = 1
All other conditions	points = 0
Rating of Site Potential If score is:1 = M0 = L	Record the rating on the first pag
S 5.0. Does the landscape have the potential to support the hydrologic functions of the	ne site?
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover tha	t generate excess
surface runoff?	Yes = 1 No = 0
Rating of Landscape Potential If score is:1 = M0 = L	Record the rating on the first page
S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems:	
The sub-basin immediately down-gradient of site has flooding problems that result in d	lamage to human or
natural resources (e.g., houses or salmon redds)	points = 2
Surface flooding problems are in a sub-basin farther down-gradient	points = 1
No flooding problems anywhere downstream	points = 0
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	
	Yes = 2 No = 0
Total for S 6 Add the poi	ints in the boxes above
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the ratina on the first page

NOTES and FIELD OBSERVATIONS:

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat H 1.0. Does the site have the potential to provide habitat? H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked. Aquatic bed 4 structures or more: points = 4 Emergent 3 structures: points = 2 Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1 Forested (areas where trees have > 30% cover) 1 structure: points = 0 If the unit has a Forested class, check if: The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods). Permanently flooded or inundated 4 or more types present: points = 3 Seasonally flooded or inundated 3 types present: points = 2 Occasionally flooded or inundated 2 types present: points = 1 Saturated only 1 type present: points = 0 _Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland Lake Fringe wetland 2 points Freshwater tidal wetland 2 points H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle If you counted: > 19 species points = 25 - 19 species (points = 1) < 5 species points = 0H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. None = 0 points **Low** = 1 point Moderate = 2 points All three diagrams in this row are **HIGH** = 3points

Wetland name or number A

H 1.5. Special habitat features:	
Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>	
Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).	
Standing snags (dbh > 4 in) within the wetland Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m)	
over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)	
Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree	
slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed)	
At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are	
permanently or seasonally inundated (structures for egg-laying by amphibians)	0
Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of	5
strata)	
Total for H 1 Add the points in the boxes above	editions (construct)
Rating of Site Potential If score is:15-18 = H7-14 = M0-6 = L Record the rating or	the first page
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).	
Calculate: % undisturbed habitat \bigcirc + [(% moderate and low intensity land uses)/2] \bigcirc = \bigcirc %	
If total accessible habitat is:	
$> \frac{1}{3}$ (33.3%) of 1 km Polygon points = 3	
20-33% of 1 km Polygon points = 2	1 1
10-19% of 1 km Polygon points = (1)	
< 10% of 1 km Polygon points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. **Calculate:** % undisturbed habitat + [(% moderate and low intensity land uses)/2] = 64	
Undisturbed habitat > 50% of Polygon points = 3	
Undisturbed habitat 10-50% and in 1-3 patches points = 2	2
Undisturbed habitat 10-50% and > 3 patches points = 1	
Undisturbed habitat < 10% of 1 km Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon: If	
> 50% of 1 km Polygon is high intensity land use points = (-2)	
≤ 50% of 1 km Polygon is high intensity points = 0	
Total for H 2 Add the points in the boxes above	4
Rating of Landscape Potential If score is:4-6 = H1-3 = M< 1 = L Record the rating on	he first page
H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose only the highest score	
that applies to the wetland being rated.	
Site meets ANY of the following criteria: points (2)	
It has 3 or more priority habitats within 100 m (see next page)	r)
— It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)	lance
 ✓ It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources 	
This a victiand of High Conservation value as determined by the Department of Natural Resources It has been categorized as an important habitat site in a local or regional comprehensive plan, in a	
Shoreline Master Plan, or in a watershed plan	
Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1	
Site does not meet any of the criteria above points = 0	
Rating of Value If score is: \(\frac{1}{2} = H \) \(\frac{1}{2} = M \) \(\frac{0}{2} = L \) Record the rating on	the first page
Motland Dating System for Mostorn MA, 2014 Undate	
Wetland Rating System for Western WA: 2014 Update 14	

MHH

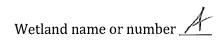
Wetland name or number

WDFW Priority Habitats

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

count now many of the following priority habitats are within 330 ft (100 m) of the wetland unit: NOTE: This question is independent of the land use between the wetland unit and the priority habitat.
— Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
 Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
— Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
Old-growth/Mature forests: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
 Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158 – see web link above).
Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
— Westside Prairies: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a we prairie (full descriptions in WDFW PHS report p. 161 – see web link above).
Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
Nearshore: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).
 Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
— Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
— Talus: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed

elsewhere.



CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? The dominant water regime is tidal,	TAMARAN Tamaran Tamaran
Vegetated, and With a salinity greater than 0.5 ppt Yes –Go to SC 1.1 No= Not an estuarine wetland	A NIALE.
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.	Cat. I
— The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?	Cat. I
http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes — Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on	
their website? Yes = Category I No = Not a WHCV	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below. If you answer YES you will still need to rate the wetland based on its functions. SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = Is a Category I bog NO — Go to SC 3.4 NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = Is a Category I bog No = Is not a bog	Cat. I

SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i>	
— Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.	
 Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). 	
Yes = Category I No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
— The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from	
marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt)	
during most of the year in at least a portion of the lagoon (needs to be measured near the bottom)	Cat. I
Yes — Go to SC 5.1 No = Not a wetland in a coastal lagoon	
SC 5.1. Does the wetland meet all of the following three conditions?	
— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less	Cat. II
than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	Cat. II
mowed grassland.	
— The wetland is larger than $^{1}/_{10}$ ac (4350 ft ²)	
Yes = Category I No = Category II	
SC 6.0. Interdunal Wetlands	
Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If	
you answer yes you will still need to rate the wetland based on its habitat functions. In practical terms that means the following geographic areas:	
— Long Beach Peninsula: Lands west of SR 103	
Grayland-Westport: Lands west of SR 105	Cat I
— Ocean Shores-Copalis: Lands west of SR 115 and SR 109	
Yes – Go to SC 6.1 No = not an interdunal wetland for rating	
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M	Cat. II
for the three aspects of function)? Yes = Category I No – Go to SC 6.2	
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?	C-t !!!
Yes = Category II No - Go to SC 6.3	Cat. III
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV	
	Cat. IV
Category of wetland based on Special Characteristics	
If you answered No for all types, enter "Not Applicable" on Summary Form	3

Wetland name or number	
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RATING SUMMARY – Western Washington

Name of wetland (site visit:
HGM Class used fo	or rating <u>Slo</u>	pe	Wetland has n	nultiple HGN	Λ classes? <u>Y</u> N
Source o	of base aerial pl	noto/map <u>(</u>	oogle		can be combined).
1. Category of				ons or sp	ecial characteristics)
	Category I – To	tal score = 23 -	27		Carre fau anak
·	Category II – To	otal score = 20	- 22		Score for each function based
	Category III – T	otal score = 16	- 19		on three ratings
	Category IV – T	otal score = 9 -	15		(order of ratings
FUNCTION	Improving Water Quality	Hydrologic	Habitat		important) 9 = H,H,H
			propriate ratings		8 = H,H,M
Site Potential	H (M) L	H M (L)	H (M) L		7 = H,H,L
Landscape Potential	H (M) L	H M L	(H) W r		7 = H,M,M
Value	(H) M L	H M (L)	H (M) L	TOTAL	6 = H,M,L
Score Based on Ratings	コ	4	7	18	6 = M,M,M 5 = H,L,L 5 = M,M,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CAT	EGORY
Estuarine	I	II
Wetland of High Conservation Value		I
Bog		I
Mature Forest		I
Old Growth Forest		I
Coastal Lagoon	I	II
Interdunal	I II	III IV
None of the above		

4 = M,L,L 3 = L,L,L

Maps and figures required to answer questions correctly for Western Washington

<u>Depressional Wetlands</u>

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	,
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	Al
Hydroperiods	H 1.2	$\mathbb{I} \mathbb{B} \mathbb{I}$
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	Al
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		A1
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	CI
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		CI
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	D
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	D

Wetland name or number B

NO - go to 6

YES - The wetland class is Riverine

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO - go to 7

YES - The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES - The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit	HGM class to
being rated	use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	•
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated. If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8. 1. Are the water levels in the entire unit usually controlled by tides except during floods? (NO) go to 2 YES - the wetland class is Tidal Fringe - go to 1.1 1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? YES - Freshwater Tidal Fringe NO - Saltwater Tidal Fringe (Estuarine) If your wetland can be classified as a Freshwater Tidal Fringe use the forms for Riverine wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands. 2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit. (NO) go to 3 YES - The wetland class is Flats If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands. 3. Does the entire wetland unit meet all of the following criteria? __The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; __At least 30% of the open water area is deeper than 6.6 ft (2 m). $NO \rightarrow go to 4$ **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe) 4. Does the entire wetland unit meet all of the following criteria? \checkmark The wetland is on a slope (slope can be very gradual), The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks, The water leaves the wetland without being impounded. YES - The wetland class is Slope NO - go to 5 NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep). 5. Does the entire wetland unit meet all of the following criteria? ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river, The overbank flooding occurs at least once every 2 years.

DEPRESSIONAL AND FLATS WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
D 1.0. Does the site have the potential to improve water quality?	and the second s
D 1.1. Characteristics of surface water outflows from the wetland:	
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).	
points = 3	
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0	
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):
Wetland has persistent, ungrazed, plants > 95% of area points = 5	
Wetland has persistent, ungrazed, plants > ½ of area points = 3	
Wetland has persistent, ungrazed plants > $\frac{1}{10}$ of area points = 1	
Wetland has persistent, ungrazed plants $< \frac{1}{10}$ of area points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:	
This is the area that is ponded for at least 2 months. See description in manual.	
Area seasonally ponded is > ½ total area of wetland points = 4	
Area seasonally ponded is > ¼ total area of wetland points = 2	
Area seasonally ponded is < 1/4 total area of wetland points = 0	
Total for D 1 Add the points in the boxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L Record the rating on the first	page
D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	
D 2.2. ls > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?	
Source Yes = 1 No = 0	
Total for D 2 Add the points in the boxes above	
Rating of Landscape Potential If score is:3 or 4 = H1 or 2 = M0 = L Record the rating on the	first page
D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (answer YES	
if there is a TMDL for the basin in which the unit is found)? Yes = 2 No = 0	
Total for D 3 Add the points in the boxes above	
Rating of Value If score is: 2-4 = H 1 = M 0 = L Record the rating on the first page	

<u>DEPRESSIONAL AND FLATS WETLANDS</u> Hydrologic Functions - Indicators that the site functions to reduce flooding	and through down date	
D 4.0. Does the site have the potential to reduce flooding and erosion?	, and stream degradati	1011
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) Wetland has an intermittently flowing stream or ditch, OR highly constricted permanentl Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently f	ditch points = 1	
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet The wetland is a "headwater" wetland Wetland is flat but has small depressions on the surface that trap water Marks of ponding less than 0.5 ft (6 in)	points = 7 points = 5 points = 3 points = 3 points = 1 points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of contributing surface water to the wetland to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit The area of the basin is 10 to 100 times the area of the unit The area of the basin is more than 100 times the area of the unit Entire wetland is in the Flats class Add the points	points = 5 points = 3 points = 0 points = 5	
Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L	in the boxes above	Sunt unun
	Record the rating on the f	ırsı page
D 5.0. Does the landscape have the potential to support hydrologic functions of the site. D 5.1. Does the wetland receive stormwater discharges?	r Yes = 1 No = 0	
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?		
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human la >1 residence/ac, urban, commercial, agriculture, etc.)?	and uses (residential at Yes = 1 No = 0	
	in the boxes above	
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the fi	irst page
D 6.0. Are the hydrologic functions provided by the site valuable to society?		4
 D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best mate the wetland unit being rated. Do not add points. Choose the highest score if more than one. The wetland captures surface water that would otherwise flow down-gradient into areas we damaged human or natural resources (e.g., houses or salmon redds): Flooding occurs in a sub-basin that is immediately down-gradient of unit. Surface flooding problems are in a sub-basin farther down-gradient. 	condition is met.	•
Flooding from groundwater is an issue in the sub-basin. The existing or potential outflow from the wetland is so constrained by human or natural constrained	points = 1	
water stored by the wetland cannot reach areas that flood. Explain why	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regiona	I flood control plan? Yes = 2 No = 0	
Total for D 6 Add the points in	n the boxes above	
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the rating on the fir	

RIVERINE AND FRESHWATER TIDAL FRINGE WET	<u>LANDS</u>	
Water Quality Functions - Indicators that the site functions to imp	rove water quality	
R 1.0. Does the site have the potential to improve water quality?	Sport of property (manage unique content on a state or content on a state or content on a state or content on a	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a	flooding event:	
Depressions cover $>^3/4$ area of wetland	points = 8	
Depressions cover > 1/2 area of wetland	points = 4	
Depressions present but cover < 1/2 area of wetland	points = 2	
No depressions present	points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin	ı classes)	
Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8	
Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $\frac{2}{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $\frac{1}{3}$ area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland	points = 0	
Total for R 1 Add the points in the boxes above		
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on t	the first page
R 2.0. Does the landscape have the potential to support the water quality function of the	ne site?	
R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that h within the last 5 years?	ave been clearcut Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questi Other sources	ons R 2.1-R 2.4 Yes = 1 No = 0	
Total for R 2 Add the points	s in the boxes above	
Rating of Landscape Potential If score is:3-6 = H1 or 2 = M0 = L	Record the rating on t	he first page
R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains	to one within 1 mi?	
	Yes = 1 No = 0	
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogo	ens? Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining wate YES if there is a TMDL for the drainage in which the unit is found)	er quality? (answer Yes = 2 No = 0	
	in the boxes above	
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the ratina on th	ne first page

RIVERINE AND FRESHWATER TIDAL F	RINGE WETLANDS	
Hydrologic Functions - Indicators that site functions to r	reduce flooding and stream erosic	n
R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides:		
Estimate the average width of the wetland perpendicular to the direction	of the flow and the width of the	
stream or river channel (distance between banks). Calculate the ratio: (a	• •	
width of stream between banks).		
If the ratio is more than 20	points = 9	
If the ratio is 10-20	points = 6	
If the ratio is 5-<10	points = 4	ļ
If the ratio is 1-<5	points = 2	
If the ratio is < 1	points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: 7	reat large woody debris as forest or	
shrub. Choose the points appropriate for the best description (polygons r		
height. These are <u>NOT Cowardin</u> classes).		
Forest or shrub for $> \frac{1}{3}$ area OR emergent plants $> \frac{2}{3}$ area	points = 7	
Forest or shrub for $> \frac{1}{10}$ area OR emergent plants $> \frac{1}{10}$ area	points = 4	
Plants do not meet above criteria	points = 0	
Total for R 4	Add the points in the boxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on ti	ne first page
R 5.0. Does the landscape have the potential to support the hydrologic for	unctions of the site?	
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	
Total for R 5	Add the points in the boxes above	
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on th	e first page
R 6.0. Are the hydrologic functions provided by the site valuable to society	ty?	
R 6.1. Distance to the nearest areas downstream that have flooding problems?		
Choose the description that best fits the site.		
The sub-basin immediately down-gradient of the wetland has flooding pro	oblems that result in damage to	
human or natural resources (e.g., houses or salmon redds)	points = 2	
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 0	
R 6.2. Has the site been identified as important for flood storage or flood convey	vance in a regional flood control plan?	
	Yes = 2. No = 0	
Total for R 6	Add the points in the boxes above	
Rating of Value If score is:2-4 = H1 = M0 = L	Record the rating on th	e first page

	•	
LAKE FRINGE WETLANDS		
Water Quality Functions - Indicators that the site function	ns to improve water quality	
L 1.0. Does the site have the potential to improve water quality?		
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes	;):	
Plants are more than 33 ft (10 m) wide	points = 6	
Plants are more than 16 ft (5 m) wide and <33 ft	points = 3	
Plants are more than 6 ft (2 m) wide and <16 ft	points = 1	
Plants are less than 6 ft wide	points = 0	
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description points, and do not include any open water in your estimate of coverage. The hathe dominant form or as an understory in a shrub or forest community. These of cover is total cover in the unit, but it can be in patches. Herbaceous does not cover of herbaceous plants is >90% of the vegetated area. Cover of herbaceous plants is >½,3 of the vegetated area. Cover of herbaceous plants is >½,3 of the vegetated area. Other plants that are not aquatic bed >½,3 unit. Other plants that are not aquatic bed in >½,3 vegetated area. Aquatic bed plants and open water cover >½,3 of the unit. Total for L 1 Add. Rating of Site Potential. If score is:8-12 = H4-7 = M0-3 = L.	herbaceous plants can be either e are not Cowardin classes. Area	
L 2.0. Does the landscape have the potential to support the water quality fund	ction of the site?	¥ #1 ₁
L 2.1. Is the lake used by power boats?	Yes = 1 No = 0	ļ
L 2.2. Is $>$ 10% of the area within 150 ft of wetland unit on the upland side in land use.	s that generate pollutants? Yes = 1 No = 0	
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such a	as milfoil? Yes = 1 No = 0	
Total for L 2 Add	the points in the boxes above	
Rating of Landscape Potential: If score is:2 or 3 = H1 = M0 = L	Record the rating on the first pag	ŋe
L 3.0. Is the water quality improvement provided by the site valuable to societ	y?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0	
- 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic res 303(d) list)?	Yes = 1 No = 0	
. 3.3. Has the site been identified in a watershed or local plan as important for mainta if there is a TMDL for the lake or basin in which the unit is found.	ining water quality? <i>Answer YES</i> Yes = 2 No = 0	
Total for L 3 Add	the points in the boxes above	
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the rating on the first nag	

LAKE FRINGE WETLANDS		
Hydrologic Functions - Indicators that the wetland unit functions to	reduce shoreline eros	ion
L 4.0. Does the site have the potential to reduce shoreline erosion?		
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do no	ot include Aquatic bed):	
Choose the highest scoring description that matches conditions in the wetland.		
> ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 6	
> ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide	points = 4	
>1⁄4 distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 4	
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)	points = 2	
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)	points = 0	
Rating of Site Potential: If score is:6 = M0-5 = L	Record the rating on	the first page
L 5.0. Does the landscape have the potential to support the hydrologic functions of t	he site?	
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0	
Total for L 5 Add the po	ints in the boxes above	
Rating of Landscape Potential If score is:2 = H1 = M0 = L	Record the rating on t	the first page
L 6.0. Are the hydrologic functions provided by the site valuable to society?		
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one choose the one with the highest score.	resource is present,	
There are human structures or old growth/mature forests within 25 ft of OHWM of the shore in the unit		
	points = 2	
There are nature trails or other paths and recreational activities within 25 ft of OHWM	points = 1	
Other resources that could be impacted by erosion	points = 1	
There are no resources that can be impacted by erosion along the shores of the unit	points = 0	
Dating of Value of Course in Co. II.	- I.I.	

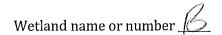
NOTES and FIELD OBSERVATIONS:

SLOPE WETLANDS		
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion		
S 4.0. Does the site have the potential to reduce flooding and stream erosion?		
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > \frac{1}{8} in), or dense enough, to remain erect during surface flows. Dense, uncut, rigid plants cover > 90% of the area of the wetland All other conditions	/	
Rating of Site Potential If score is: 1 = M0 = L Record the rating on	the first page	
S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	/	
Rating of Landscape Potential If score is: 1 = M0 = L Record the rating on t	he first page	
S 6.0. Are the hydrologic functions provided by the site valuable to society?		
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream points = 0	2	
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No \neq 0	0	
Total for S 6 Add the points in the boxes above	2	
Rating of Value If score is: 2-4 = H1 = M0 = L Record the rating on the	ne first page	
NOTES and FIELD OBSERVATIONS:		

SLOPE WETLANDS Water Quality Functions - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)	
Slope is 1% or less points = 3	
Slope is > 1%-2% points = 2	/
Slope is > 2%-5% points <u>(1)</u>	ł
Slope is greater than 5% points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions): Yes = 3 No $\neq 0$	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.	
Dense, uncut, herbaceous plants > 90% of the wetland area points = 6	
Dense, uncut, herbaceous plants > ½ of area	3
Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1	-
Dods not most any strain and provide the strain and str	ار
	4
Rating of Site Potential If score is: 12 = H 6-11 = M 10-5 = L Record the rating on t	he first page
S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes \bigcirc No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?	4~
Other sources Yes = 1 No = 0	0
Total for S 2 Add the points in the boxes above	1
Rating of Landscape Potential If score is: 1-2 = M0 = L Record the rating on t	he first page
S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the $303(d)$ list?	0
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the 303(d) list. Yes = 1 No 0	0
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No 0 S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is	0
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the 303(d) list. Yes = 1 No 60 S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES	0

LML

H 1.5. Special habitat features:		
Check the habitat features that are present in the wetland.	The number of checks is the number of points.	
Large, downed, woody debris within the wetland (> 4 in		
Standing snags (dbh > 4 in) within the wetland	addingter and o're long,	
Undercut banks are present for at least 6.6 ft (2 m) and	or overhanging plants extends at least 3.3 ft /1 ml	
over a stream (or ditch) in, or contiguous with the wetl		
Stable steep banks of fine material that might be used by	· ·	
slope) OR signs of recent beaver activity are present (co		
where wood is exposed)	testinans of trees that have not yet weathered	
At least ¼ ac of thin-stemmed persistent plants or wood	ly hranches are present in areas that are	
permanently or seasonally inundated (structures for eg		1
✓ Invasive plants cover less than 25% of the wetland area		5
strata)	an every education of plants (see 11 1.11) of hist of	
Total for H 1	Add the points in the boxes above	en, minimal
Rating of Site Potential If score is:15-18 = H	_0-6 = L Record the rating on	the first page
H 2.0. Does the landscape have the potential to support the h		, , ,
H 2.1. Accessible habitat (include only habitat that directly abuts we		
	e and low intensity land uses)/2] $\cancel{B} = \cancel{18}$ _%	
If total accessible habitat is:		
> ¹ / ₃ (33.3%) of 1 km Polygon	points = 3	
20-33% of 1 km Polygon	points = 2	1
10-19% of 1 km Polygon	points =(1)	de la companya de la
< 10% of 1 km Polygon	points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.		
Calculate: % undisturbed habitat \mathcal{G} + [(% moderate	and low intensity land uses)/2] $\frac{18}{19} = \frac{69}{19}$ %	
Undisturbed habitat > 50% of Polygon	points =(3)	
Undisturbed habitat 10-50% and in 1-3 patches	points = 2	<i>-</i>
Undisturbed habitat 10-50% and > 3 patches	points = 1	3
Undisturbed habitat < 10% of 1 km Polygon	points = 0	
H 2.3. Land use intensity in 1 km Polygon: If		
> 50% of 1 km Polygon is high intensity land use	points = (- 2)	
≤ 50% of 1 km Polygon is high intensity	points = (*2)	0
Total for H 2		A
	Add the points in the boxes above	
Rating of Landscape Potential If score is: 4-6 = H1-3 = M _	<1=L Record the rating on th	e first page
H 3.0. Is the habitat provided by the site valuable to society?		
H 3.1. Does the site provide habitat for species valued in laws, regula	tions, or policies? Choose only the highest score	
that applies to the wetland being rated.	, ,	i
Site meets ANY of the following criteria:	points = 2	1
— It has 3 or more priority habitats within 100 m (see next p	•	
 It provides habitat for Threatened or Endangered species 		1
 It is mapped as a location for an individual WDFW priority 		
 It is a Wetland of High Conservation Value as determined 		
 It has been categorized as an important habitat site in a lo 		ļ
Shoreline Master Plan, or in a watershed plan		1
Site has 1 or 2 priority habitats (listed on next page) within 100	0 m points (1)	ASSESSMENT AND ADDRESS OF THE PARTY OF THE P
Site does not meet any of the criteria above	points = 0	
Rating of Value If score is:2 = H1 = M0 = L	Record the rating on the	ne first page
	5	
Wetland Rating System for Western WA: 2014 Update	14	
Rating Form – Effective January 1, 2015		



These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat H 1.0. Does the site have the potential to provide habitat? H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked. Aquatic bed 4 structures or more: points = 4 3 structures: points = 2 <u>_____</u>Émergent 2 structures: points = 1 Scrub-shrub (areas where shrubs have > 30% cover) 1 structure: points = 0 Forested (areas where trees have > 30% cover) If the unit has a Forested class, check if: The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods). Permanently flooded or inundated 4 or more types present: points = 3 /_Seasonally flooded or inundated 3 types present: points = 2 $\sqrt{2}$ types present: points = 1 Occasionally flooded or inundated 1 type present: points = 0 Saturated only Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland Lake Fringe wetland 2 points 2 points Freshwater tidal wetland H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle points = 2If you counted: > 19 species Lane points 71) 5 - 19 species points = 0< 5 species H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. Low = 1 point Moderate = 2 points None = 0 points All three diagrams in this row are **HIGH** = 3points

Wetland name or number

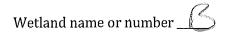
WDFW Priority Habitats

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: **NOTE:** This question is independent of the land use between the wetland unit and the priority habitat.

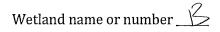
- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests: Old-growth west of Cascade crest Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 see web link above*).
- Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 see web link above*).
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Nearshore: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).
- Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, and and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.



CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type		Category
Check off any criteria that apply to the wetland. Circle the	e category when the appropriate criteria are met.	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for E — The dominant water regime is tidal, — Vegetated, and	Estuarine wetlands?	
— With a salinity greater than 0.5 ppt	Yes –Go to SC 1.1 No= Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, I Preserve, State Park or Educational, Environmenta	National Park, National Estuary Reserve, Natural Area al, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2	Cat. I
than 10% cover of non-native plant species. (—— At least ¾ of the landward edge of the wetlar	at least two of the following three conditions? diking, ditching, filling, cultivation, grazing, and has less (If non-native species are <i>Spartina</i> , see page 25) nd has a 100ft buffer of shrub, forest, or un-grazed or un-	Cat. I
mowed grassland.The wetland has at least two of the following contiguous freshwater wetlands.	features: tidal channels, depressions with open water, or Yes = Category I No = Category II	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHO SC 2.1. Has the WA Department of Natural Resources upd Conservation Value? SC 2.2. Is the wetland listed on the WDNR database as a V	lated their website to include the list of Wetlands of High Yes – Go to SC 2.2 No – Go to SC 2.3	Cat. I
SC 2.3. Is the wetland in a Section/Township/Range that c http://www1.dnr.wa.gov/nhp/refdesk/datasearch		
SC 2.4. Has WDNR identified the wetland within the S/T/R their website?		
below. If you answer YES you will still need to rate SC 3.1. Does an area within the wetland unit have organic more of the first 32 in of the soil profile? SC 3.2. Does an area within the wetland unit have organic over bedrock, or an impermeable hardpan such as pond? SC 3.3. Does an area with peats or mucks have more than cover of plant species listed in Table 4? NOTE: If you are uncertain about the extent of mo measuring the pH of the water that seeps into a hoplant species in Table 4 are present, the wetland is SC 3.4. Is an area with peats or mucks forested (> 30% cov western hemlock, lodgepole pine, quaking aspen, loggepole pine, quakin	soil horizons, either peats or mucks, that compose 16 in or Yes – Go to SC 3.3 No – Go to SC 3.2 soils, either peats or mucks, that are less than 16 in deep clay or volcanic ash, or that are floating on top of a lake or Yes – Go to SC 3.3 No = Is not a bog 70% cover of mosses at ground level, AND at least a 30% Yes = Is a Category I bog No – Go to SC 3.4 sses in the understory, you may substitute that criterion by ole dug at least 16 in deep. If the pH is less than 5.0 and the sa bog.	Cat. I



SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions</i> .	
— Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.	
— Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).	
Yes = Category I No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks	·
— The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (needs to be measured near the bottom) Yes — Go to SC 5.1 No = Not a wetland in a coastal lagoon	Cat. I
SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.	Cat. II
The wetland is larger than $^{1}/_{10}$ ac (4350 ft ²) Yes = Category I No = Category II	
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If you answer yes you will still need to rate the wetland based on its habitat functions. In practical terms that means the following geographic areas:	
 Long Beach Peninsula: Lands west of SR 103 Grayland-Westport: Lands west of SR 105 Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to SC 6.1 No = not an interdunal wetland for rating 	Catl
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = Category I No – Go to SC 6.2 SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?	Cat. II
Yes = Category II No – Go to SC 6.3 SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category II No – Go to SC 6.3 Yes = Category III No = Category IV	Cat. III
Colores of well-well-well-well-well-well-well-well	Cat. IV
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland name or number	
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RATING SUMMARY – Western Washington

Name of wetland (or ID #): Or cas Arrent - Wetland (Date of	
Rated by Ab Sb Trained by Ecology? Yes N	o Date of training 2010
HGM Class used for rating Slove Wetland has multiple HGM	1 classes?YN
NOTE: Form is not complete without the figures requested (figures of Source of base aerial photo/map	can be combined).
OVERALL WETLAND CATEGORY (based on functions or spe	ecial characteristics)
1. Category of wetland based on FUNCTIONS	
Category I — Total score = 23 - 27	
Category II - Total score = 20 - 22	Score for each function based
Category III - Total score = 16 - 19	on three ratings
Category IV — Total score = 9 - 15	(order of ratings
FUNCTION Improving Hydrologic Habitat	important)
Water Quality	9 = H.H.H

FUNCTION		mproving ater Quality	Н	ydrol	ogic	Ņ.	Habitat	
				Circle	the ap	propi	riate ratings]
Site Potential	Н	M (L)	Н	M	(1)	Н	M (L)	
Landscape Potential	Н	M) L	Н	M) L	Н	M) L	
Value	Н	M (L)	H) M	L	Н	M	TOTAL
Score Based on Ratings		4		6			4	14

Score for each function based on three ratings (order of ratings is not important) 9 = H,H,H 8 = H,H,M 7 = H,H,L 7 = H,M,M 6 = H,M,L 6 = M,M,M 5 = H,L,L 5 = M,M,L 4 = M,L,L 3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CAT	EGORY
Estuarine	I	II
Wetland of High Conservation Value		I
Bog		I
Mature Forest	I	
Old Growth Forest		I
Coastal Lagoon	I	II
Interdunal	I II	III IV
None of the above		

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	į.
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions: Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4
Plant cover of trees, shrubs, and herbaceous plants	L 1.2
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L3.3

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	A
Hydroperiods	H 1.2	BI
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	Al
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		A1
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	CI
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		C2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	D
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	D

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated. If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8. 1. Are the water levels in the entire unit usually controlled by tides except during floods? (NO) go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1 1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? NO - Saltwater Tidal Fringe (Estuarine) **YES - Freshwater Tidal Fringe** If your wetland can be classified as a Freshwater Tidal Fringe use the forms for Riverine wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands. 2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit. NO) go to 3 **YES** - The wetland class is **Flats** If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands. 3. Does the entire wetland unit **meet all** of the following criteria? __The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; __At least 30% of the open water area is deeper than 6.6 ft (2 m). (NO)- go to 4 **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe) 4. Does the entire wetland unit meet all of the following criteria? The wetland is on a slope (*slope can be very gradual*), The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks. $\cancel{\,\,\,\,\,\,\,\,\,\,\,\,}$ The water leaves the wetland **without being impounded**. NO - go to 5 YES -The wetland class is Slope NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep). 5. Does the entire wetland unit **meet all** of the following criteria? ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river. ___The overbank flooding occurs at least once every 2 years.

Wetland name or number

NO – go to 6

YES - The wetland class is Riverine

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO - go to 7

YES - The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES - The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit	HGM class to
being rated	use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	·
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

DEPRESSIONAL AND FLATS WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. <u>Characteristics of surface water outflows from the wetland</u> :	
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).	
points = 3	
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2	
wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0	
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):	
Wetland has persistent, ungrazed, plants > 95% of area points = 5	
Wetland has persistent, ungrazed, plants > $\frac{1}{2}$ of area points = 3	
Wetland has persistent, ungrazed plants $> \frac{1}{10}$ of area points = 1	
Wetland has persistent, ungrazed plants $< \frac{1}{10}$ of area points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:	
This is the area that is ponded for at least 2 months. See description in manual.	
Area seasonally ponded is > 1/2 total area of wetland points = 4	
Area seasonally ponded is > 1/4 total area of wetland points = 2	
Area seasonally ponded is < 1/4 total area of wetland points = 0	
Total for D 1 Add the points in the boxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L Record the rating on the first part of the score is:12-16 = H6-11 = M0-5 = L	ge
D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	
D 2.2. Is $>$ 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = $1 \text{ No} = 0$	
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?	
Source Yes = 1 No = 0	
Total for D 2 Add the points in the boxes above	
Rating of Landscape Potential If score is:3 or 4 = H1 or 2 = M0 = L Record the rating on the fire	st page
D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (answer YES if there is a TMDL for the basin in which the unit is found)? Yes = 2 No = 0	
Total for D 3 Add the points in the boxes above	
Total for B 3	

<u>DEPRESSIONAL AND FLATS WE</u>	TLANDS
Hydrologic Functions - Indicators that the site functions to redu	ce flooding and stream degradation
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (r Wetland has an intermittently flowing stream or ditch, OR highly constricted Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permand Wetland has an unconstricted, or slightly constricted, surface outlet that is p	d permanently flowing outletpoints = 2 ently flowing ditch points = 1
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above to with no outlet, measure from the surface of permanent water or if dry, the definition of ponding are 3 ft or more above the surface or bottom of outlet Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet The wetland is a "headwater" wetland Wetland is flat but has small depressions on the surface that trap water Marks of ponding less than 0.5 ft (6 in) D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of contributing surface water to the wetland to the area of the wetland unit itse	points = 7 points = 5 points = 3 points = 3 points = 1 points = 0 If the area of upstream basin If.
The area of the basin is less than 10 times the area of the unit The area of the basin is 10 to 100 times the area of the unit The area of the basin is more than 100 times the area of the unit Entire wetland is in the Flats class	points = 5 points = 3 points = 0 points = 5
	dd the points in the boxes above
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on the first page
D 5.0. Does the landscape have the potential to support hydrologic function	s of the site?
D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0
D 5.2. Is $$ >10% of the area within 150 ft of the wetland in land uses that generate ex	ccess runoff? Yes = 1 No = 0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intens >1 residence/ac, urban, commercial, agriculture, etc.)?	sive human land uses (residential at Yes = 1 No = 0
Total for D 5 Ad	ld the points in the boxes above
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the first page
D 6.0. Are the hydrologic functions provided by the site valuable to society?	
 D 6.1. The unit is in a landscape that has flooding problems. Choose the description to the wetland unit being rated. Do not add points. Choose the highest score if m The wetland captures surface water that would otherwise flow down-gradient damaged human or natural resources (e.g., houses or salmon redds): Flooding occurs in a sub-basin that is immediately down-gradient of unit. Surface flooding problems are in a sub-basin farther down-gradient. Flooding from groundwater is an issue in the sub-basin. 	nore than one condition is met.
The existing or potential outflow from the wetland is so constrained by humar water stored by the wetland cannot reach areas that flood. <i>Explain why</i>	· ·
There are no problems with flooding downstream of the wetland.	points = 0
0 6.2. Has the site been identified as important for flood storage or flood conveyance	e in a regional flood control plan? Yes = 2 No = 0
otal for D 6 Ado	the points in the boxes above
ating of Value If score is:2-4 = H1 = M0 = L	Record the rating on the first page

Wetland Rating System for Western WA: 2014 Update Rating Form – Effective January 1, 2015

RIVERINE AND FRESHWATER TIDAL FRINGE WET	ANDS	
Water Quality Functions - Indicators that the site functions to impro		
R 1.0. Does the site have the potential to improve water quality?	- y-	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a f	flooding event:	T
Depressions cover > 3/4 area of wetland	points = 8	
Depressions cover > ½ area of wetland	points = 4	
Depressions present but cover < 1/2 area of wetland	points = 2	
No depressions present	points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin of	classes)	
Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8	
Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $^2/_3$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $^{1}/_{3}$ area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0	
Total for R 1 Add the points in the boxes above		
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on th	he first page
R 2.0. Does the landscape have the potential to support the water quality function of the	e site?	
R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have within the last 5 years?	ve been clearcut Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in question Other sources	ns R 2.1-R 2.4 Yes = 1 No = 0	
Total for R 2 Add the points i	n the boxes above	
Rating of Landscape Potential If score is:3-6 = H1 or 2 = M0 = L	Record the rating on th	e first page
R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.1 . Is the wetland along a stream or river that is on the 303 (d) list or on a tributary that drains t	o one within 1 mi?	····
	Yes = 1 No = 0	
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogen	ıs?	
	Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water YES if there is a TMDL for the drainage in which the unit is found)		
	Yes = 2 No = 0	•
Add the points if	n the boxes above	
Sating of value if Score is:z-4 = n1 = V U = L	Record the rating on the	e first page

RIVERINE AND FRESHWATER TIDAL FRINGE	<u>WETLANDS</u>	
Hydrologic Functions - Indicators that site functions to reduce flo	ooding and stream erosion	100
R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction of the flow stream or river channel (distance between banks). Calculate the ratio: (average wide width of stream between banks). If the ratio is more than 20		
If the ratio is 10-20 If the ratio is 5-<10 If the ratio is 1-<5 If the ratio is < 1	points = 6 points = 4 points = 2 points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large shrub. Choose the points appropriate for the best description (polygons need to hav height. These are NOT Cowardin classes). Forest or shrub for $> 1/3$ area OR emergent plants $> 1/3$ area Forest or shrub for $> 1/10$ area OR emergent plants $> 1/3$ area Plants do not meet above criteria		
Total for R 4 Add the	points in the boxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on the fi	rst page
R 5.0. Does the landscape have the potential to support the hydrologic functions of	of the site?	
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	
Total for R 5 Add the	points in the boxes above	
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the fi	rst page
R 6.0. Are the hydrologic functions provided by the site valuable to society?		
R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. The sub-basin immediately down-gradient of the wetland has flooding problems tha human or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	t result in damage to points = 2 points = 1 points = 0	
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a r	regional flood control plan? Yes = 2 No = 0	
Total for R 6 Add the p	points in the boxes above	
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the rating on the fir	st naga

LAKE FRINGE WETLANDS	
Water Quality Functions - Indicators that the site functions to imp	prove water quality
L 1.0. Does the site have the potential to improve water quality?	The state of the s
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes):	
Plants are more than 33 ft (10 m) wide	points = 6
Plants are more than 16 ft (5 m) wide and <33 ft	points = 3
Plants are more than 6 ft (2 m) wide and <16 ft	points = 1
Plants are less than 6 ft wide	points = 0
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that resumpoints, and do not include any open water in your estimate of coverage. The herbaceous the dominant form or as an understory in a shrub or forest community. These are not Conference of cover is total cover in the unit, but it can be in patches. Herbaceous does not include acceptable of the property of herbaceous plants is >90% of the vegetated area	s plants can be either owardin classes. Area quatic bed.
Cover of herbaceous plants is $>90\%$ of the vegetated area	points = 6
Cover of herbaceous plants is $> \frac{1}{3}$ of the vegetated area	points = 4
Other plants that are not aquatic bed $> \frac{2}{3}$ unit	points = 3 points = 3
Other plants that are not aquatic bed in $> \frac{1}{3}$ vegetated area	points = 1
Aquatic bed plants and open water cover $> \frac{2}{3}$ of the unit	points = 0
	s in the boxes above
Rating of Site Potential If score is:8-12 = H4-7 = M0-3 = L	Record the rating on the first page
L 2.0. Does the landscape have the potential to support the water quality function of the	ne site?
L 2.1. Is the lake used by power boats?	Yes = 1 No = 0
L 2.2. Is $>$ 10% of the area within 150 ft of wetland unit on the upland side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that general contents of the same states are a side in land uses that the same states are a side in land uses that the same states are a side in land uses that the same states are a side in land uses that the same states are a side in land uses the same states are a side in land uses that the same states are a side in land uses the same stat	erate pollutants? Yes = 1 No = 0
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as milfoil?	Yes = 1 No = 0
Total for L 2 Add the points	s in the boxes above
Rating of Landscape Potential: If score is:2 or 3 = H1 = M0 = L	Record the rating on the first page
L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource in the 303(d) list)?	he basin is on the Yes = 1 No = 0
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining wate if there is a TMDL for the lake or basin in which the unit is found.	er quality? <i>Answer YES</i> Yes = 2 No = 0
Total for L 3 Add the points	in the boxes above
Rating of Value If score is:2-4 = H1 = M0 = L	Record the rating on the first page

Wetland name or number <u>C</u>

<u>LAKE FRINGE WETLANDS</u>	
Hydrologic Functions - Indicators that the wetland unit functions to re	educe shoreline erosion
L 4.0. Does the site have the potential to reduce shoreline erosion?	
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do not	include Aquatic bed):
Choose the highest scoring description that matches conditions in the wetland.	, ,
> ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 6
> ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide	points = 4
> ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 4
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)	points = 2
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)	points = 0
Rating of Site Potential: If score is:6 = M0-5 = L	Record the rating on the first p
L 5.0. Does the landscape have the potential to support the hydrologic functions of the	e site?
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0
tal for L 5 Add the points in the boxes above	
Rating of Landscape Potential If score is: 2 = H 1 = M 0 = L	Record the rating on the first p
L 6.0. Are the hydrologic functions provided by the site valuable to society?	
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one re choose the one with the highest score.	esource is present,
There are human structures or old growth/mature forests within 25 ft of OHWM of the sl	nore in the unit
,	points = 2
There are nature trails or other paths and recreational activities within 25 ft of OHWM	points = 1
The state of the original and recreational activities within 25 ft of Onyvivi	politis – I

Rating of Value: If score is:___2 = H ____1 = M ____0 = L

Other resources that could be impacted by erosion

There are no resources that can be impacted by erosion along the shores of the unit

Record the rating on the first page

points = 1

points = 0

NOTES and FIELD OBSERVATIONS:

SLOPE WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop in elevation for every	
100 ft of horizontal distance)	
Slope is 1% or less points = 3	
Slope is > 1%-2% points = 2	ı
Slope is > 2%-5% points = 1	
Slope is greater than 5% points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions): Yes = 3 No(=0)	\bigcirc
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants:	
Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you	
have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.	
Daniel word I al	
Dongs though hard-served at 1. C	
Dones woods whether 1/ of an	
Donne umant hadron variable to f	\bigcirc
Does not meet any of the criteria above for plants Does not meet any of the criteria above for plants points = 1 points = 0	
Total for S 1 Add the points in the boxes above	1
And the points in the boxes above	/
Rating of Site Potential If score is: $_12 = H$ $_6-11 = M$ $_4$ $_0-5 = L$ Record the rating on the score is: $_12 = H$ $_20-5 = L$	he first page
S 2.0. Does the landscape have the potential to support the water quality function of the site?	
5 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?	
Yes = 1 No = 0	1
5 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?	
Other sources	0
Total for S 2 Add the points in the boxes above	
tating of Landscape Potential If score is: $\sqrt{1-2} = M$ 0 = L Record the rating on the	ne first page
3.0. Is the water quality improvement provided by the site valuable to society?	
·	
3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No $\neq 0$	B
3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the 303(d) list. Yes = 1 No \neq 0	0
3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES	\bigcirc
if there is a TMDL for the basin in which unit is found. Yes = $2 \text{ No} \neq 0$ otal for S 3 Add the points in the boxes above	<u> </u>
ating of Value If score is:2-4 = H1 = M \(\frac{1}{2}\)0 = L Record the rating on the	

LML

Wetland name or number ______

SLOPE WETLANDS		
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion		
S 4.0. Does the site have the potential to reduce flooding and stream erosion?		
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows. Dense, uncut, rigid plants cover > 90% of the area of the wetland points = 1	0	
All other conditions points (0)	the first nage	
Rating of Site Potential If score is: 1 = M 0 = L Record the rating on a	ine jirst page	
S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0		
Rating of Landscape Potential If score is: \(\sqrt{1} = \text{NI} \)0 = L \(Record the rating on the first points.		
S 6.0. Are the hydrologic functions provided by the site valuable to society?		
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream points = 0	2	
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? $Yes = 2 No \neq 0$	0	
Total for S 6 Add the points in the boxes above	2	
Rating of Value If score is: $\sqrt{2-4} = H$ 1 = M0 = L Record the rating on the first page		

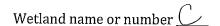
NOTES and FIELD OBSERVATIONS:

MH

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked. Aquatic bed Emergent Scrub-shrub (areas where shrubs have > 30% cover) Forested (areas where trees have > 30% cover) If the unit has a Forested class, check if:	
The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods). Permanently flooded or inundated Seasonally flooded or inundated Occasionally flooded or inundated Saturated only Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland Lake Fringe wetland Freshwater tidal wetland Present: points = 0 2 points	4
H 1.3. Richness of plant species	
Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle If you counted: > 19 species 5 - 19 species < 5 species 10 points = 0 H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.	1
None Opoints Low = 1 point Moderate = 2 points	
All three diagrams in this row are HIGH = 3points	0

Wetland name or number <u>C</u>

H 1.5. Special habitat features:			
Check the habitat features that are present in the wetland. The number of checks is the number of points.			
Large, downed, woody debris within the wetland (> 4 in diameter as	Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).		
Standing snags (dbh > 4 in) within the wetland	*		
Undercut banks are present for at least 6.6 ft (2 m) and/or overhan	ging plants extends at least 3.3 ft (1 m)		
over a stream (or ditch) in, or contiguous with the wetland, for at le	east 33 ft (10 m)		
Stable steep banks of fine material that might be used by beaver or	muskrat for denning (> 30 degree		
slope) OR signs of recent beaver activity are present (cut shrubs or	trees that have not yet weathered		
where wood is exposed)			
At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are			
permanently or seasonally inundated (structures for egg-laying by amphibians)			
Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of			
strata)			
Total for H 1	Add the points in the boxes above	3	
Rating of Site Potential If score is:15-18 = H7-14 = M0-6 = L	Record the rating on a	he first page	
H 2.0. Does the landscape have the potential to support the habitat fund	tions of the site?		
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).			
Calculate: % undisturbed habitat () + [(% moderate and low in	tensity land uses)/2] $O = O \%$		
If total accessible habitat is:			
$> \frac{1}{3}$ (33.3%) of 1 km Polygon	points = 3		
20-33% of 1 km Polygon	points = 2		
10-19% of 1 km Polygon	points = 1	1	
< 10% of 1 km Polygon	points €0		
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.			
Calculate: % undisturbed habitat 34+ [(% moderate and low int	tensity land uses)/2] 2 = 63 %		
Undisturbed habitat > 50% of Polygon	points =(3)		
Undisturbed habitat 10-50% and in 1-3 patches	points = 2		
Undisturbed habitat 10-50% and > 3 patches	points = 1	3	
Undisturbed habitat < 10% of 1 km Polygon	points = 0		
H 2.3. Land use intensity in 1 km Polygon: If			
> 50% of 1 km Polygon is high intensity land use	points = (- 2)		
≤ 50% of 1.km Polygon is high intensity	points €0	0	
Total for H 2	Add the points in the boxes above	-	
Rating of Landscape Potential If score is:4-6 = H	Record the rating on th	e first naae	
That is a second of the second	nessra the rating on th	e jiist page	
H 3.0. Is the habitat provided by the site valuable to society?			
H 3.1. Does the site provide habitat for species valued in laws, regulations, or po	licies? Choose only the highest score		
that applies to the wetland being rated.			
Site meets ANY of the following criteria:	points = 2		
 It has 3 or more priority habitats within 100 m (see next page) 	· ·	ı	
 It provides habitat for Threatened or Endangered species (any plant of the provides habitat for Threatened or Endangered species) 	or animal on the state or federal lists)	-	
It is mapped as a location for an individual WDFW priority species		[,	
It is a Wetland of High Conservation Value as determined by the Department of t			
It has been categorized as an important habitat site in a local or regio	nal comprehensive plan, in a	j	
Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m	points = 1	\bigcirc	
	·		
Site does not meet any of the criteria above	points = (0)	- Cont	
Rating of Value If score is:2 = H1 = M0 = L	Record the rating on t	ne Jirst page	
Wetland Rating System for Western WA: 2014 Update	14		



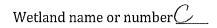
WDFW Priority Habitats

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: *NOTE:* This question is independent of the land use between the wetland unit and the priority habitat.

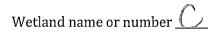
- **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests: Old-growth west of Cascade crest Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 see web link above*).
- Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 see web link above*).
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Nearshore: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, and and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.



CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.	
SC 1.0. Estuarine wetlands	
Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to SC 1.1 No= Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area	
Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	Cat. I
mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV)	
SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I No = Not a WHCV	Cat. I
SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf	
Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV	
SC 3.0. Bogs	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i> SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes — Go to SC 3.3 No — Go to SC 3.2 SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep	
over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes — Go to SC 3.3 No = Is not a bog SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30%	
cover of plant species listed in Table 4? Yes = Is a Category I bog No — Go to SC 3.4 NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the	
plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = Is a Category I bog No = Is not a bog	Cat. I



SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate</i>	
the wetland based on its functions.	
— Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered	
canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of	
age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.	
— Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the	
species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).	
Yes = Category I No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
— The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from	
marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks	
— The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt)	C-+ !
during most of the year in at least a portion of the lagoon (needs to be measured near the bottom)	Cat. I
Yes — Go to SC 5.1 No = Not a wetland in a coastal la goon SC 5.1. Does the wetland meet all of the following three conditions?	
— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less	
than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).	Cat. II
— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	
mowed grassland.	
— The wetland is larger than $\frac{1}{10}$ ac (4350 ft ²)	
Yes = Category I No = Category II	
SC 6.0. Interdunal Wetlands	
Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If	
you answer yes you will still need to rate the wetland based on its habitat functions.	
In practical terms that means the following geographic areas:	
— Long Beach Peninsula: Lands west of SR 103	Cati
— Grayland-Westport: Lands west of SR 105	Cati
 Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to SC 6.1 No = not an interdunal wetland for rating 	
res – Go to SC 6.1 No – not an interdunal wedand for fating	
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M	Cat. II
for the three aspects of function)? Yes = Category I No – Go to SC 6.2	
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?	
Yes = Category II No – Go to SC 6.3	Cat. III
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?	
Yes = Category III No = Category IV	Cat. IV
Category of wetland based on Special Characteristics	
If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland name or number	
	This page left blank intentionally

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Orcas Airport - Wet D Date	of site visit: 6/3/4
Rated by AV Yes Trained by Ecology? Yes	* ~ y 1 3
HGM Class used for rating Depressional Wetland has multiple H	GM classes?YN
NOTE: Form is not complete without the figures requested (figure Source of base aerial photo/map <u>Google, STC Polaric</u>	es can be combined).
OVERALL WETLAND CATEGORY (based on functions or	special characteristics)
1. Category of wetland based on FUNCTIONSCategory I — Total score = 23 - 27	
Category II – Total score = 20 - 22 Category III – Total score = 16 - 19	Score for each function based on three
Category IV — Total score = 9 - 15	ratings (order of ratings is not
FUNCTION Improving Hydrologic Habitat Water Quality Circle the appropriate ratings	important) 9 = H,H,H 8 = H,H,M
Site Potential H M L H M L H M L	7 = H,H,L
Landscape Potential H M L H M L H M L	7 = H M M

(M)

TOTAL

6 = H, M, L

6 = M,M,M

5 = H,L,L

5 = M,M,L 4 = M,L,L 3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

(L)

Value

Ratings

Score Based on

CHARACTERISTIC	CAT	regory
Estuarine	I	II
Wetland of High Conservation Value		I
Bog		Ĭ
Mature Forest		I
Old Growth Forest		Ĭ
Coastal Lagoon	I	II
Interdunal	I II	III IV
None of the above		_

Wetland nam	e or numb	or D	,
Wettallu lialli	e or mann	JEI/_	

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	A2
Hydroperiods	D 1.4, H 1.2	B2
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	B2
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	C3
Map of the contributing basin	D 4.3, D 5.3	E2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	C3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	D
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	\overline{D}

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated. If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8. 1. Are the water levels in the entire unit usually controlled by tides except during floods? (NØ – go to 2 **YES** - the wetland class is **Tidal Fringe** - go to 1.1 1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **NO - Saltwater Tidal Fringe (Estuarine)** YES - Freshwater Tidal Fringe If your wetland can be classified as a Freshwater Tidal Fringe use the forms for Riverine wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands. 2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit. YES - The wetland class is Flats If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands. 3. Does the entire wetland unit **meet all** of the following criteria? __The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; __At least 30% of the open water area is deeper than 6.6 ft (2 m). (ÑO → go to 4 **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe) 4. Does the entire wetland unit meet all of the following criteria? The wetland is on a slope (slope can be very gradual). ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks, The water leaves the wetland without being impounded. $NO \rightarrow go to 5$ **YES** - The wetland class is **Slope** NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep). 5. Does the entire wetland unit **meet all** of the following criteria? ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river, _The overbank flooding occurs at least once every 2 years.

Wetland name or number _______

(NO) go to 6

YES – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO - go to 7

(ES) The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES - The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit	HGM class to
being rated	use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

DEPRESSIONAL AND FLATS WETLANDS		1000
Hydrologic Functions - Indicators that the site functions to reduce flooding a	nd stream degrada	tion
D 4.0. Does the site have the potential to reduce flooding and erosion?	A STATE OF THE STA	ta grajnaran.
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing directly wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing directly has an unconstricted, or slightly constricted, surface outlet that is permanently flowing directly has an unconstricted.	tch points = 1	2
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet The wetland is a "headwater" wetland Wetland is flat but has small depressions on the surface that trap water Marks of ponding less than 0.5 ft (6 in)	points = 7 points = 5 points = 3 points = 1 points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of up contributing surface water to the wetland to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit The area of the basin is 10 to 100 times the area of the unit The area of the basin is more than 100 times the area of the unit Entire wetland is in the Flats class Total for D 4 Rating of Site Potential If score is: 12-16 = H 16-11 = M 0-5 = L	points = 5 points = 3 points = 0 points = 5 the boxes above	3
	ecord the rating on the	first page
D 5.0. Does the landscape have the potential to support hydrologic functions of the site? D 5.1. Does the wetland receive stormwater discharges?		
	Yes = 1 No = 0	
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human lanc >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = 0	(
Total for D 5 Add the points in 1	the boxes above	3
Rating of Landscape Potential If score is: 1/3 = H1 or 2 = M0 = L Re	cord the rating on the j	first page
0 6.0. Are the hydrologic functions provided by the site valuable to society?		
 O 6.1. The unit is in a landscape that has flooding problems. Choose the description that best matche the wetland unit being rated. Do not add points. Choose the highest score if more than one continuous the wetland captures surface water that would otherwise flow down-gradient into areas whe damaged human or natural resources (e.g., houses or salmon redds): Flooding occurs in a sub-basin that is immediately down-gradient of unit. 	ondition is met.	
 Surface flooding problems are in a sub-basin farther down-gradient. Flooding from groundwater is an issue in the sub-basin. 	points = 1 points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural cond water stored by the wetland cannot reach areas that flood. <i>Explain why</i>	ditions that the points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	
6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flo	ood control plan? Yes = 2 No = 0	Ô
otal for D 6 Add the points in the	and the second s	
a five of Value II and it is a five of the same of the	ord the rating on the fi	rst nage

Wetland Rating System for Western WA: 2014 Update Rating Form – Effective January 1, 2015

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DEPRESSIONAL AND FLATS WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
D 1.0. Does the site have the potential to improve water quality?	engradia (1941 - 1942) T
D 1.1. Characteristics of surface water outflows from the wetland:	
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).	
points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points $= (2)$	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No $\neq 0$	
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area Wetland has persistent, ungrazed plants > $\frac{1}{10}$ of area Wetland has persistent, ungrazed plants > $\frac{1}{10}$ of area Wetland has persistent, ungrazed plants < $\frac{1}{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation:	
This is the area that is ponded for at least 2 months. See description in manual.	
Area seasonally ponded is > ½ total area of wetland points $\neq 4$	4
Area seasonally ponded is > 1/4 total area of wetland points = 2 Area seasonally ponded is < 1/4 total area of wetland points = 0	1
The decident of the second of	a
Total for D 1 Add the points in the boxes above	
Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L Record the rating on the first page	ge
D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes 1 No = 0	
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes \neq 1 No = 0	
D 2.3. Are there septic systems within 250 ft of the wetland?	Ò
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source Yes = 1 No \(\frac{4}{9} \)	0
Total for D 2 Add the points in the boxes above	2
Rating of Landscape Potential If score is:3 or 4 = H1 or 2 = M0 = L Record the rating on the first	st page
D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (answer YES if there is a TMDL for the basin in which the unit is found)? Yes = 2 No 70	0
Total for D 3 Add the points in the boxes above	0
Rating of Value If score is:2-4 = H1 = M0 = L Record the rating on the first page	

MML 5

Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L			
R 1.0. Does the site have the potential to improve water quality? R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover > ³ / ₄ area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Points = 2 R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes) Trees or shrubs > ¹ / ₃ area of the wetland Trees or shrubs > ¹ / ₃ area of the wetland Herbaceous plants (> 6 in high) > ¹ / ₃ , area of the wetland Herbaceous plants (> 6 in high) > ¹ / ₃ , area of the wetland Depressions present Add the points in the boxes above Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L Record the rating on the first page R 2.0. Does the landscape have the potential to support the water quality function of the site? R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0 R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? Yes = 1 No = 0 R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0 R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources Add the points in the boxes above Rating of Landscape Potential If score is: 3-6 = H 1 or 2 = M 0 1 Record the rating on the first page R 3.0. Is the water quality improvement provided by the site valuable to society? R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	RIVERINE AND FRESHWATER TIDAL FRINGE WE	<u>TLANDS</u>	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover > ½, area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Depressions present but cover < ½ area of wetland Depressions present points = 0 R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes) Trees or shrubs > ½, area of the wetland Trees or shrubs > ½, area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ½, area of the wetland Herbaceous plants (> 6 in high) > ½, area of the wetland Doints = 6 Herbaceous plants (> 6 in high) > ½, area of the wetland Doints = 6 Herbaceous plants (> 6 in high) > ½, area of the wetland Doints = 0 Total for R 1 Add the points in the boxes above Rating of Site Potential If score is:12.16 = H6.11 = M0.5 = L	Water Quality Functions - Indicators that the site functions to imp	prove water quality	
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Depressions present but cover < 1/2 area of wetland No depressions present No depressions present Points = 2 points = 0 R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes) Trees or shrubs > \(^1/2\) area of the wetland points = 8 Trees or shrubs > \(^1/2\) area of the wetland points = 6 Herbaceous plants (> 6 in high) > \(^1/2\) area of the wetland points = 6 Herbaceous plants (> 6 in high) > \(^1/2\) area of the wetland points = 0 Total for R 1 Add the points in the boxes above Rating of Site Potential If score is: 12-16 = H6-11 = M0-5 = L Record the rating on the first page R 2.0. Does the landscape have the potential to support the water quality function of the site? R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0 R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? Yes = 1 No = 0 R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0 R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0 R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources Add the points in the boxes above Rating of Landscape Potential If score is:3-6 = H1 or 2 = M	Depressions cover > 3/4 area of wetland		İ
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes) Trees or shrubs > ² / ₃ area of the wetland Trees or shrubs > ¹ / ₃ area of the wetland Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants (> 6 in high) > ¹ / ₃ area of the wetland Points = 6 Herbaceous plants =	Depressions cover > ½ area of wetland	points = 4	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes) Trees or shrubs > ½ area of the wetland Trees or shrubs > ½ area of the wetland Herbaceous plants (> 6 in high) > ½ area of the wetland Herbaceous plants (> 6 in high) > ½ area of the wetland Herbaceous plants (> 6 in high) > ½ area of the wetland Points = 8 Trees, shrubs, and ungrazed herbaceous < ½ area of the wetland Trees, shrubs, and ungrazed herbaceous < ½ area of the wetland Total for R 1 Add the points in the boxes above R 2.0. Does the landscape have the potential to support the water quality function of the site? R 2.1. Is the wetland within an incorporated city or within its UGA? R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources R 2.6. Add the points in the boxes above Rating of Landscape Potential If score is: 3-6 = H 1 or 2 = M 0 = L Record the rating on the first page R 3.0. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0 R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	Depressions present but cover < 1/2 area of wetland	points = 2	
Trees or shrubs > \frac{2}{3} area of the wetland Trees or shrubs > \frac{1}{3} area of the wetland Trees or shrubs > \frac{1}{3} area of the wetland Herbaceous plants (> 6 in high) > \frac{1}{3} area of the wetland Herbaceous plants (> 6 in high) > \frac{1}{3} area of the wetland Herbaceous plants (> 6 in high) > \frac{1}{3} area of the wetland Points = 3 Trees, shrubs, and ungrazed herbaceous < \frac{1}{3} area of the wetland Total for R 1 Add the points in the boxes above Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L Record the rating on the first page R 2.0. Does the landscape have the potential to support the water quality function of the site? R 2.1. Is the wetland within an incorporated city or within its UGA? R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources	No depressions present	points = 0	
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Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L		points = 3	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0	
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R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources			
Other sources	R 2.4. Is $> 10\%$ of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	
Rating of Landscape Potential If score is:3-6 = H1 or 2 = M0 = L			
R 3.0. Is the water quality improvement provided by the site valuable to society? R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0 R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	Total for R 2 Add the point	s in the boxes above	
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Yes = 1 No = 0 R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drain	s to one within 1 mi?	
Yes = 1 No = 0			
	R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathog	gens?	!
2.2. Has the site been identified in a costaveled as least plant a top set of the costat to the cost of the site o			
	3.3. Has the site been identified in a watershed or local plan as important for maintaining water		
			o fivet

RIVERINE AND FRESHWATER TIDAL FF Hydrologic Functions - Indicators that site functions to re	The state of the s	
R 4.0. Does the site have the potential to reduce flooding and erosion?	educe nooding and stream erosion	
R 4.1. Characteristics of the overbank storage the wetland provides:		
Estimate the average width of the wetland perpendicular to the direction of stream or river channel (distance between banks). Calculate the ratio: (as width of stream between banks).		
If the ratio is more than 20	points = 9	
If the ratio is 10-20	points = 6	
If the ratio is 5-<10	points = 4	
If the ratio is 1-<5	points = 2	
If the ratio is < 1	points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: Transhrub. Choose the points appropriate for the best description (polygons ne height. These are NOT Cowardin classes). Forest or shrub for $> \frac{1}{3}$ area OR emergent plants $> \frac{2}{3}$ area		
Forest or shrub for $> \frac{1}{10}$ area OR emergent plants $> \frac{1}{10}$ area	points = 7	
Plants do not meet above criteria	points = 0	
Total for R 4	Add the points in the boxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L R 5.0. Does the landscape have the potential to support the hydrologic fu	Record the rating on the first pagingtions of the site?	ge
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	
Total for R 5	Add the points in the boxes above	
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the first pag	је
R 6.0. Are the hydrologic functions provided by the site valuable to society	/?	\Box
R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. The sub-basin immediately down-gradient of the wetland has flooding probleman or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	plems that result in damage to points = 2 points = 1 points = 0	
R 6.2. Has the site been identified as important for flood storage or flood conveya	nce in a regional flood control plan? Yes = 2. No = 0	
Total for R 6	Add the points in the boxes above	
Rating of Value If score is: 2-4 = H 1 = M 0 = I	Record the rating on the first nag	

LAKE FRINGE WETLANDS	
Water Quality Functions - Indicators that the site functions to im	prove water quality
L 1.0. Does the site have the potential to improve water quality?	
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes):	The state of the s
Plants are more than 33 ft (10 m) wide	points = 6
Plants are more than 16 ft (5 m) wide and <33 ft	points = 3
Plants are more than 6 ft (2 m) wide and <16 ft	points = 1
Plants are less than 6 ft wide	points = 0
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that respond to a not include any open water in your estimate of coverage. The herbaceous the dominant form or as an understory in a shrub or forest community. These are not conference of cover is total cover in the unit, but it can be in patches. Herbaceous does not include a Cover of herbaceous plants is >90% of the vegetated area	us plants can be either Cowardin classes. Area aquatic bed.
Cover of herbaceous plants is $> \frac{2}{3}$ of the vegetated area	points = 6
Cover of herbaceous plants is $> \frac{1}{3}$ of the vegetated area	points = 4 points = 3
Other plants that are not aquatic bed $> \frac{2}{3}$ unit	points = 3
Other plants that are not aquatic bed in $> \frac{1}{3}$ vegetated area	points = 1
Aquatic bed plants and open water cover $> \frac{2}{3}$ of the unit	points = 0
	nts in the boxes above
Rating of Site Potential If score is:8-12 = H4-7 = M0-3 = L	Record the rating on the first pag
L 2.0. Does the landscape have the potential to support the water quality function of t	the site?
L 2.1. Is the lake used by power boats?	Yes = 1 No = 0
L 2.2. Is $>$ 10% of the area within 150 ft of wetland unit on the upland side in land uses that ger	nerate pollutants? Yes = 1 No = 0
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as milfoil?	? Yes = 1 No = 0
Total for L 2 Add the poin	ts in the boxes above
Rating of Landscape Potential: If score is:2 or 3 = H1 = M0 = L	Record the rating on the first page
L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0
2 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource in 303(d) list)?	the basin is on the Yes = 1 No = 0
3.3. Has the site been identified in a watershed or local plan as important for maintaining wat if there is a TMDL for the lake or basin in which the unit is found.	er quality? <i>Answer YES</i> Yes = 2 No = 0
Total for L 3 Add the point	ts in the boxes above
Rating of Value If score is:2-4 = H1 = M0 = L	Record the rating on the first page

LAKE FRINGE WETLANDS		
Hydrologic Functions - Indicators that the wetland unit functions to rec	duce shoreline eros	ion
L 4.0. Does the site have the potential to reduce shoreline erosion?		
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do not in Choose the highest scoring description that matches conditions in the wetland.	nclude Aquatic bed):	
> ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 6	
> 3⁄4 of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide	points = 4	
> ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 4	
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)	points = 2	
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)	points = 0	
Rating of Site Potential: If score is:6 = M0-5 = L	Record the rating on	the first page
L 5.0. Does the landscape have the potential to support the hydrologic functions of the	site?	
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0	
Total for L 5 Add the points	in the boxes above	
Rating of Landscape Potential If score is:2 = H1 = M0 = L	Record the rating on t	he first page
L 6.0. Are the hydrologic functions provided by the site valuable to society?		
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one res choose the one with the highest score.	ource is present,	
There are human structures or old growth/mature forests within 25 ft of OHWM of the sho	ore in the unit	
	points = 2	
There are nature trails or other paths and recreational activities within 25 ft of OHWM	points = 1	
Other resources that could be impacted by erosion	points = 1	
There are no resources that can be impacted by erosion along the shores of the unit	points = 0	

NOTES and FIELD OBSERVATIONS:

Rating of Value: If score is: __2 = H ___1 = M ___0 = L

Record the rating on the first page

SLOPE WETLANDS		
Water Quality Functions - Indicators that the	site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?		
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope	nas a 1 ft vertical drop in elevation for every	•
100 ft of horizontal distance)		
Slope is 1% or less	points = 3	
Slope is > 1%-2%	points = 2	
Slope is > 2%-5%	points = 1	
Slope is greater than 5%	points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true c		
S 1.3. Characteristics of the plants in the wetland that trap sediments a	· · · · · · · · · · · · · · · · · · ·	
Choose the points appropriate for the description that best fits the have trouble seeing the soil surface (>75% cover), and uncut meathan 6 in.		
Dense, uncut, herbaceous plants > 90% of the wetland area	points = 6	
Dense, uncut, herbaceous plants > ½ of area	points = 3	
Dense, woody, plants > ½ of area	points = 2	
Dense, uncut, herbaceous plants > ¼ of area	points = 1	
Does not meet any of the criteria above for plants	points = 0	
Total for S 1	Add the points in the boxes above	
Rating of Site Potential If score is:12 = H6-11 = M0-5 = I	. Record the rating on the first pa	ige
S 2.0. Does the landscape have the potential to support the wate	r quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland	in land uses that generate pollutants?	
	Yes = 1 No = 0	
S 2.2. Are there other sources of pollutants coming into the wetland that	t are not listed in question S 2.1?	
Other sources	Yes = 1 No = 0	
		- 1
Total for S 2	Add the points in the boxes above	
Total for S 2 Rating of Landscape Potential If score is:1-2 = M0 = L	Add the points in the boxes above Record the rating on the first page.	ge
	Record the rating on the first page	ge
Rating of Landscape Potential If score is:1-2 = M0 = L S 3.0. Is the water quality improvement provided by the site value	Record the rating on the first pagable to society?	ge
Rating of Landscape Potential If score is:1-2 = M0 = L S 3.0. Is the water quality improvement provided by the site value S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream,	Record the rating on the first page able to society? river, lake, or marine water that is on the $Yes = 1 No = 0$	ige
Rating of Landscape Potential If score is:1-2 = M0 = L S 3.0. Is the water quality improvement provided by the site value S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, 303(d) list? S 3.2. Is the wetland in a basin or sub-basin where water quality is an iss	Record the rating on the first page able to society? river, lake, or marine water that is on the Yes = $1 \text{ No} = 0$ ue? At least one aquatic resource in the basin is Yes = $1 \text{ No} = 0$	ge
Rating of Landscape Potential If score is:1-2 = M0 = L S 3.0. Is the water quality improvement provided by the site value S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, 303(d) list? S 3.2. Is the wetland in a basin or sub-basin where water quality is an iss on the 303(d) list. S 3.3. Has the site been identified in a watershed or local plan as important.	Record the rating on the first page able to society? river, lake, or marine water that is on the Yes = 1 No = 0 ue? At least one aquatic resource in the basin is Yes = 1 No = 0 ant for maintaining water quality? Answer YES	ge

Wetland name or number \sum

SLOPE WETLANDS	
Hydrologic Functions - Indicators that the site functions to	reduce flooding and stream erosion
S 4.0. Does the site have the potential to reduce flooding and stream eros	sion?
S 4.1. Characteristics of plants that reduce the velocity of surface flows during sto for the description that best fits conditions in the wetland. Stems of plants in), or dense enough, to remain erect during surface flows.	
Dense, uncut, rigid plants cover > 90% of the area of the wetland	points = 1
All other conditions	points = 0
Rating of Site Potential If score is:1 = M0 = L	Record the rating on the first page
S 5.0. Does the landscape have the potential to support the hydrologic fur	nctions of the site?
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses	or cover that generate excess
surface runoff?	Yes = 1 No = 0
Rating of Landscape Potential If score is:1 = M0 = L	Record the rating on the first page
S 6.0. Are the hydrologic functions provided by the site valuable to society	/?
S 6.1. Distance to the nearest areas downstream that have flooding problems:	
The sub-basin immediately down-gradient of site has flooding problems th	at result in damage to human or
natural resources (e.g., houses or salmon redds)	points = 2
Surface flooding problems are in a sub-basin farther down-gradient	points = 1
No flooding problems anywhere downstream	points = 0
S 6.2. Has the site been identified as important for flood storage or flood conveya	nce in a regional flood control plan? Yes = 2 No = 0
Total for S 6	Add the points in the boxes above
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the rating on the first page

NOTES and FIELD OBSERVATIONS:

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of	noints	
Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).	ponits.	
Standing snags (dbh > 4 in) within the wetland		
Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least	3.3 ft (1 m)	
over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)		
Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet wed	degree	
where wood is exposed)	itnerea	
At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that ar	re i	
permanently or seasonally inundated (structures for egg-laying by amphibians)		
Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 fo	r list of	_
Total for H 1 Add the points in the bo	vos abovo	<i>(</i> 2)
That the points in the so		
	the rating on i	the first page
H 2.0. Does the landscape have the potential to support the habitat functions of the site?		
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).		
Calculate: % undisturbed habitat \bigcirc + [(% moderate and low intensity land uses)/2] \bigcirc =	%	
If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon		
20 220/ 141 - D.1	points = 3	
do door to be a like	points = 2	
the state of the s	points = 1	1
	points =(0)	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.		
Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2] = Undisturbed habitat > 50% of Polygon		
· · · · · · · · · · · · · · · · · · ·	points = 3	
11 11 . 1 11 11	points =(2)	2
II Part II that are say and	points = 1	Garage Street
H 2.3. Land use intensity in 1 km Polygon: If	points = 0	
FOR CALL THE		
4500/ f41 B1 11111111111111111111111111111111	nts = (- 2)	\cap
	points =(0)	
7 dd the points in the box		G
	e rating on the	? Jirst page
H 3.0. Is the habitat provided by the site valuable to society?		
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose only the high	est score	
that applies to the wetland being rated.	į	1
	oints = 2	ĺ
 It has 3 or more priority habitats within 100 m (see next page) 		
— It provides habitat for Threatened or Endangered species (any plant or animal on the state or fed	eral lists)	ĺ
— It is mapped as a location for an individual WDFW priority species	ļ	ĺ
— It is a Wetland of High Conservation Value as determined by the Department of Natural Resource	es .	
It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan	a [
	oints =(1)	
Site does not meet any of the criteria above	pints = 0	E .
, , , , , , , , , , , , , , , , , , , ,	e rating on th	e first page
		- , page

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of % ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked. Aquatic bed Emergent Scrub-shrub (areas where shrubs have > 30% cover) Forested (areas where trees have > 30% cover) If the unit has a Forested class, check if: The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	2
H 1.2. Hydroperiods	
Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods). Permanently flooded or inundated Seasonally flooded or inundated Occasionally flooded or inundated Saturated only Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland Lake Fringe wetland Freshwater tidal wetland 2 points 2 points	2
H 1.3. Richness of plant species	
Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle If you counted: > 19 species 5 - 19 species 9 points = 2 5 - 5 species 9 points = 0	
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. None = 0 points Low 1 point Moderate = 2 points All three diagrams in this row are HIGH = 3points	

Wetland name or number	
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WDFW Priority Habitats

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: **NOTE:** This question is independent of the land use between the wetland unit and the priority habitat.

- **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests: Old-growth west of Cascade crest Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158 see web link above).
- **Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 see web link above*).
- **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (full descriptions of habitats and the definition of relatively undisturbed are in WDFW report see web link on previous page).
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

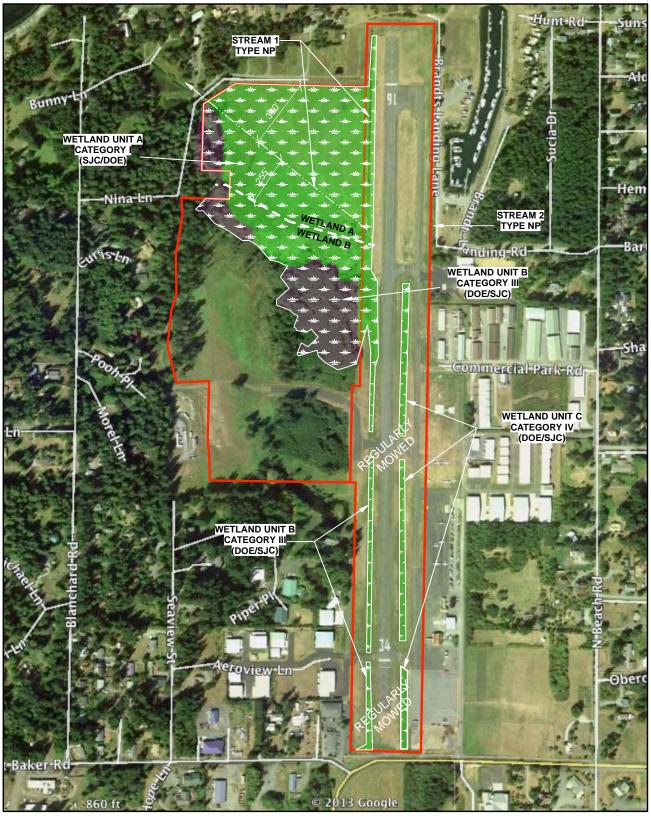
CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and	
— With a salinity greater than 0.5 ppt Yes –Go to SC 1.1 No= Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2	Cat. I
 SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- 	Cat. I
mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to SC 2.2 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I No = Not a WHCV	Cat. I
SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes — Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV	
SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below. If you answer YES you will still need to rate the wetland based on its functions. SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes — Go to SC 3.3 No — Go to SC 3.2 SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes — Go to SC 3.3 No = Is not a bog SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = Is a Category I bog No — Go to SC 3.4 NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = Is a Category I bog No = Is not a bog	Cat. I

Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA							
Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate</i>							
the wetland based on its functions.							
— Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.							
 Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). 							
Yes = Category I No = Not a forested wetland for this section							
C 5.0. Wetlands in Coastal Lagoons							
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?							
The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from							
marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks							
— The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (needs to be measured near the bottom)	Cat. I						
Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon							
C 5.1. Does the wetland meet all of the following three conditions?							
— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less	Cat. I						
than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).	Cat. II						
— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.							
— The wetland is larger than $^{1}/_{10}$ ac (4350 ft ²)							
Yes = Category I No = Category II							
C 6.0. Interdunal Wetlands							
Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If							
you answer yes you will still need to rate the wetland based on its habitat functions.							
In practical terms that means the following geographic areas:							
Long Beach Peninsula: Lands west of SR 103Grayland-Westport: Lands west of SR 105	Cat I						
Ocean Shores-Copalis: Lands west of SR 115 and SR 109							
Yes – Go to SC 6.1 No = not an interdunal wetland for rating							
6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M	Cat. II						
for the three aspects of function)? Yes = Category I No – Go to SC 6.2							
6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?							
Yes = Category II No – Go to SC 6.3	Cat. III						
6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?							
Yes = Category III No = Category IV	Cat. IV						

Wetland name or number	
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FIGURE A1: Cowardin Plant Classes & Plant Cover - Airport Site
ORCAS ISLAND AIRPORT
Section 11, Township 37N, Range 2W, W.M.
Latitude: 48.706192
Longitude: -122.907186







PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

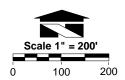
Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure A1 DATE: May 2015

FIGURE A2: Cowardin Plant Classes & Plant Cover - South Site ORCAS ISLAND AIRPORT

Section 11, Township 37N, Range 2W, W.M. *Latitude:* 48.706192 *Longitude:* -122.907186



<u>\</u>

= FORESTED

= EMERGENT



PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

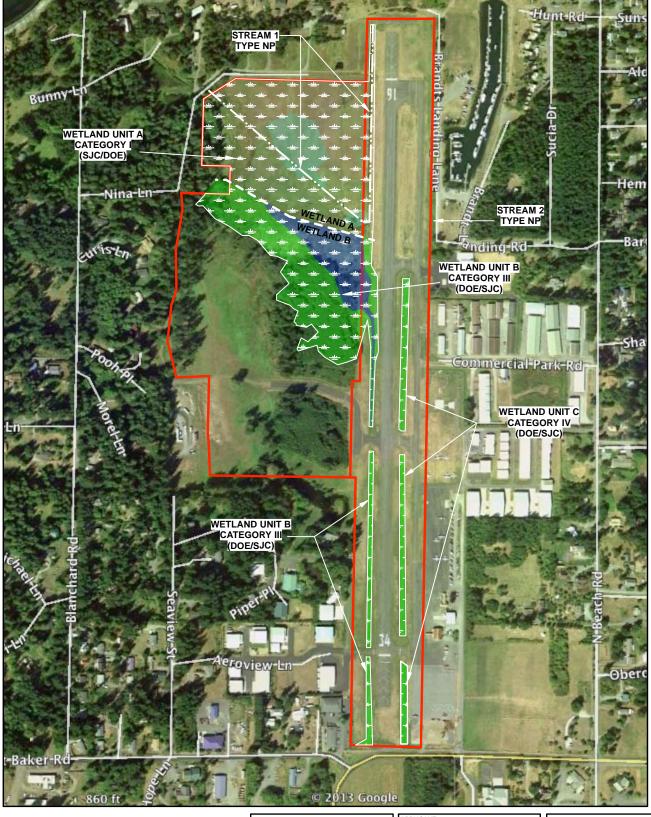
DATUM: NAVD88

APPLICANT:

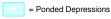
Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure A2 DATE: May 2015 FIGURE B1: Hydroperiods & Ponded Depressions - Airport Site
ORCAS ISLAND AIRPORT
Section 11, Township 37N, Range 2W, W.M.
- Latitude: 48.706192
Longitude: -122.907186







= Saturated only

= Seasonally/Occasionally ponded

PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements

DATUM: NAVD88

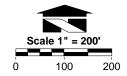
APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

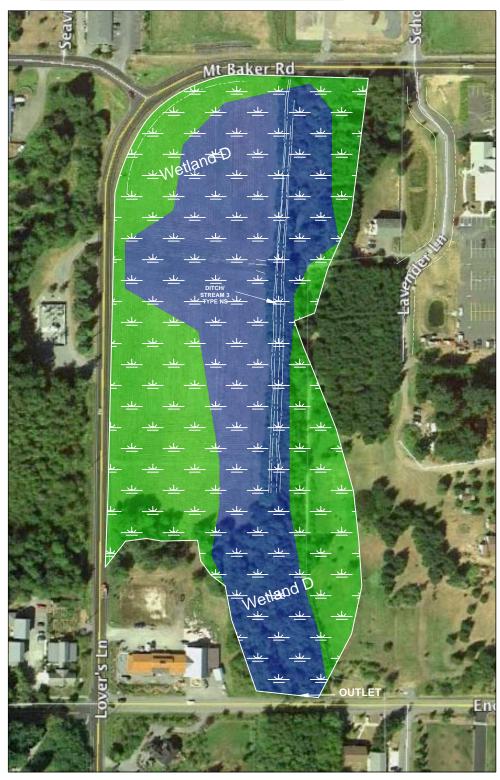
COUNTY: San Juan STATE: Washington Figure B1 DATE: May 2015

FIGURE B2: Hydroperiods & Ponded Depressions - South Site ORCAS ISLAND AIRPORT Section 11, Township 37N, Range 2W, W.M. Latitude: 48.706192 Longitude: -122.907186



= Saturated only

= Seasonally ponded



PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

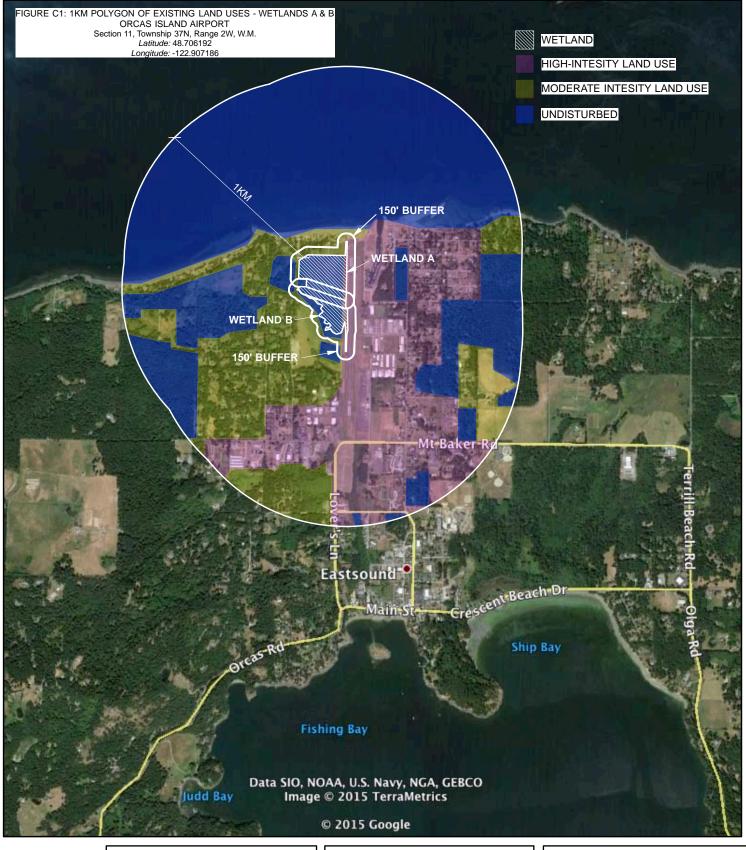
DATUM: NAVD88

APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure 2 DATE: May 2015



PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

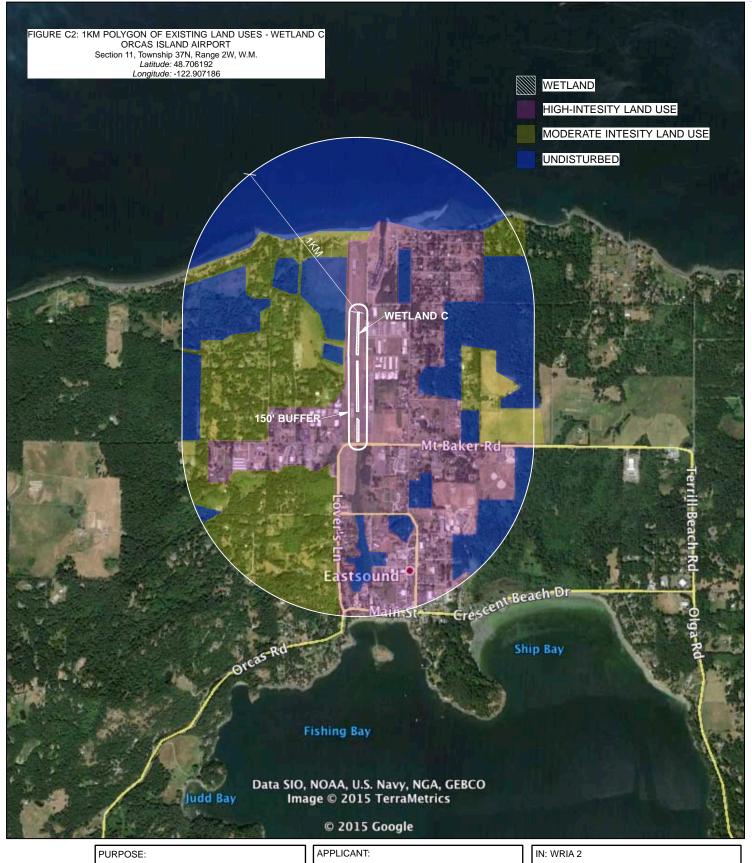
APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 N: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure C1

DATE: May 2015



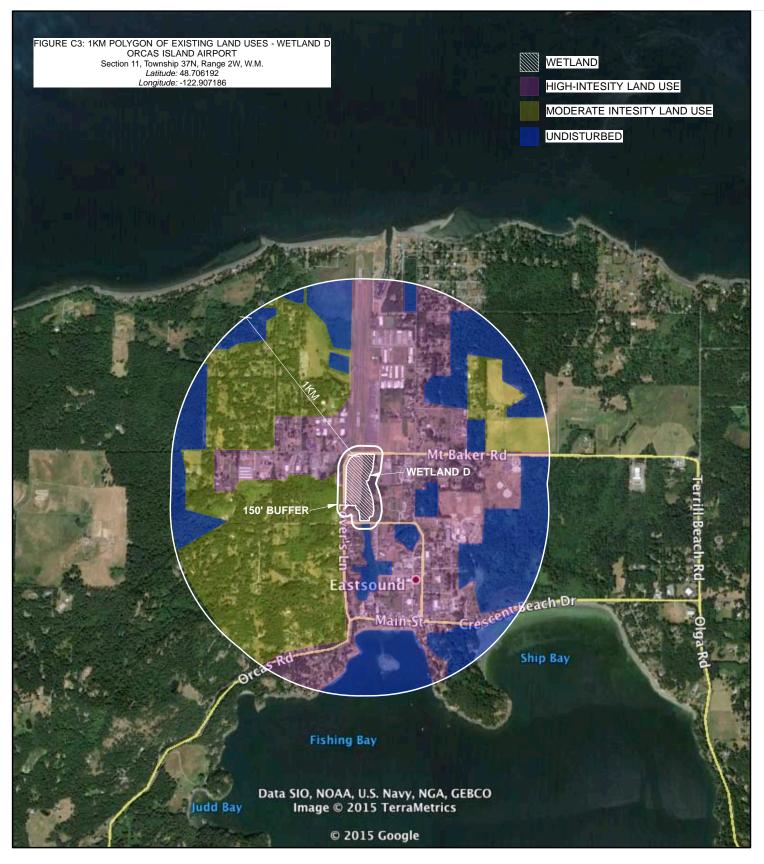
Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure C2

DATE: May 2015



PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure C3 DATE: May 2015

FIGURE D: Screen Captures of 303(d) Listed Waters & TDMLs ORCAS ISLAND AIRPORT

Section 11, Township 37N, Range 2W, W.M. *Latitude:* 48.706192 *Longitude:* -122.907186



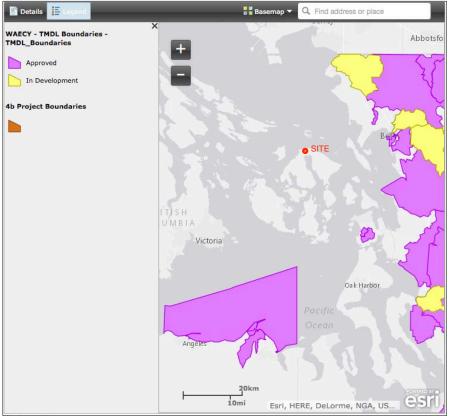
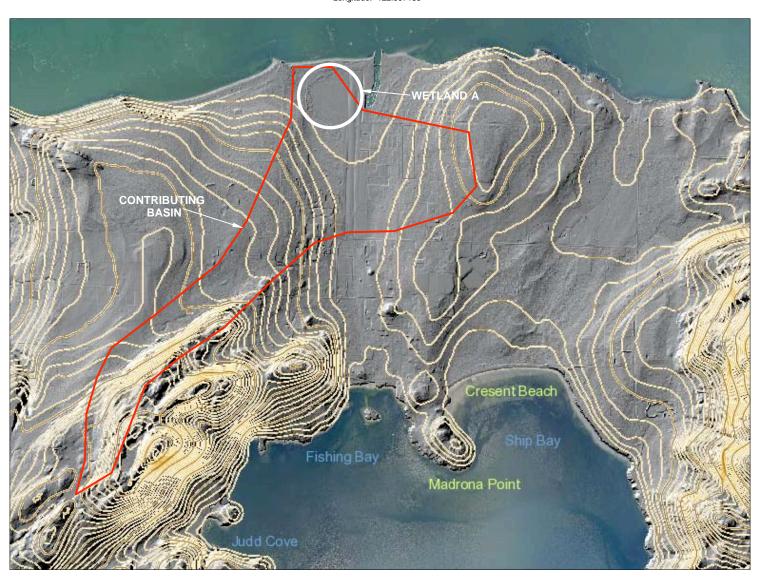


FIGURE E1: CONTRUBUTING BASIN - WETLAND A ORCAS ISLAND AIRPORT Section 11, Township 37N, Range 2W, W.M. Latitude: 48.706192 Longitude: -122.907186



PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

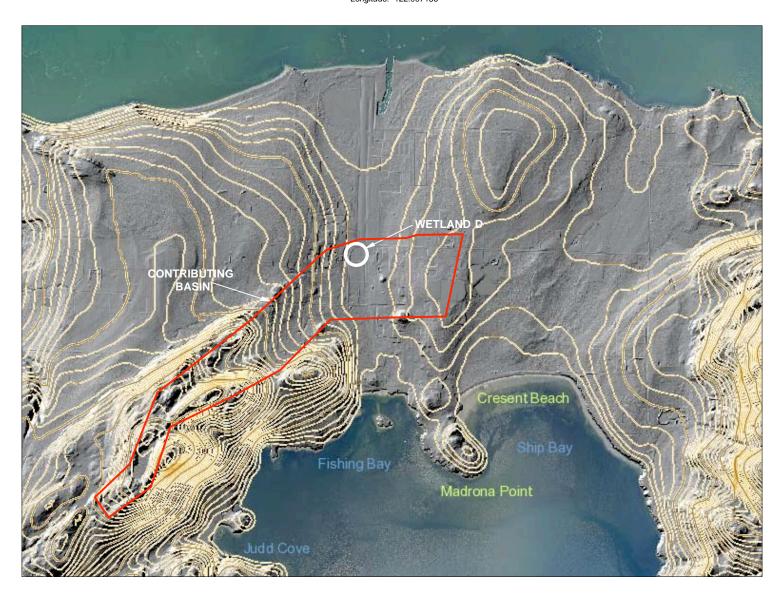
Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011 IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure E1

DATE: May 2015

FIGURE E2: CONTRUBUTING BASIN - WETLAND A ORCAS ISLAND AIRPORT Section 11, Township 37N, Range 2W, W.M. Latitude: 48.706192 Longitude: -122.907186



PURPOSE:

Orcas Island Airport Improvements Project: To improve airport facility, operations and to comply with FAA requirements.

DATUM: NAVD88

APPLICANT:

Port of Orcas c/o WH Pacific Attn: Flannan Tam 12100 NE 195th St., #300 Bothell, WA 98011

IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

COUNTY: San Juan STATE: Washington Figure E2

DATE: May 2015



WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Orcas Island Airport		(City/Cou	_{ınty:} San Juar	n County	_ Samplino	g Date: 11/8/	13
Applicant/Owner: Orcas Island Airport (c/o WH Pacific, Inc.					State: WA Sampling Point: 1			
Investigator(s): A. Bachman & S. Brain	nard	;	Section,	, Township, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drain	ageways		Local re	elief (concave,	convex, none): Concave	Э	Slope (%	6): <u>0-5</u>
Subregion (LRR): LRR-A		Lat: 48°4	42'17.9	6"N	Long: 122°54'33.06"\	Ν	Datum:	
Soil Map Unit Name: Sholander-Spiede	en complex, 0 to	5 percent sl	opes		NWI classifi	cation:		
Are climatic / hydrologic conditions on th	e site typical for th	nis time of yea						
Are Vegetation, Soil, or F	-lydrology	significantly	disturbe	ed? Are "	Normal Circumstances"	present?	Yes _ 🗸 _	No
Are Vegetation, Soil, or F	-lydrology	naturally pro	blematio	c? (If ne	eded, explain any answ	ers in Rem	arks.)	
SUMMARY OF FINDINGS - At	tach site map	showing	samp	ling point l	ocations, transects	s, impor	tant featur	res, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸 _	No		s the Sampled	Aroa			
Hydric Soil Present?	Yes _ 🗸 _ 1	No		vithin a Wetlar		No		
Wetland Hydrology Present?	Yes _ 🗸 _ I	No		The street of th	100			
Remarks:								
VECETATION Line exicutific	nomes of als							
VEGETATION – Use scientific	names of piai	Absolute	Domin	nant Indicator	Dominanaa Taat war	kohooti		
Tree Stratum (Plot size:)			es? Status	Dominance Test work Number of Dominant S			
1					That Are OBL, FACW,	or FAC:	1	_ (A)
2					Total Number of Domi	nant		
3					Species Across All Stra	ata:	1	(B)
4					Percent of Dominant S	Species	400	
Sapling/Shrub Stratum (Plot size:)		_= I otal	Cover	That Are OBL, FACW,	or FAC:	100	(A/B)
1					Prevalence Index wo	rksheet:		
2					Total % Cover of:		Multiply by:	
3					OBL species			
4					FACW species			
5					FAC species			
Herb Stratum (Plot size:)		_= I otal	Cover	FACU species			
1. Holcus lanatus		95	Υ	Fac	Column Totals:			
2. Oenanthe sarmentosa		5	N	Obl	Column Fotalo.	(//		(B)
3					Prevalence Index			
4					Hydrophytic Vegetati		ors:	
5					Dominance Test is Prevalence Index			
6					Morphological Ada		(Provide cupp	orting
7					data in Remark	s or on a s	separate shee	et)
8 9					Wetland Non-Vaso	cular Plants	s ¹	
10					Problematic Hydro	ophytic Veg	getation¹ (Exp	lain)
11.					¹ Indicators of hydric so be present, unless dist			y must
		100	= Total	Cover	be present, unless dist	urbed or p	TODIETTIALIC.	
Woody Vine Stratum (Plot size:	•							
1					Hydrophytic Vegetation			
2						es	No	•
% Bare Ground in Herb Stratum		-	= Total	Cover				
Remarks:					<u>I</u>			

SOIL								Sa	ampling Point:	1	
Profile Des	scription: (Desc	ribe to the de	pth needed to doo	ument the indic	ator or co	nfirm the a	bsence	of indicato	rs.)		
Depth	Mat		Re	dox Features							
(inches)	Color (mois	<u>t)</u> %	Color (moist)	<u>% T</u> y	/pe ¹ Lo		xture		Remarks		
0-6	2.5Y 2/1					Salo		Moist			
6-8	5Y 4/2		10YR 3/6	5		F. S	Salo	Moist			
8-18+	10YR 3/1					Salo)	Moist			
<u></u>			-								
	_										
	_				-						
1Type: C=0	Concentration D-	-Depletion PA	/=Reduced Matrix,	CS-Covered or (Coated Sar	nd Grains	2l oc	ation: DI =	Pore Lining, M	1-Matrix	
			II LRRs, unless otl		ooaled oal				lematic Hydr		
Histoso			Sandy Redox					Muck (A10	-		
	Epipedon (A2)		Stripped Mat			= -	Red Parent Material (TF2)				
	Histic (A3)		Loamy Muck	y Mineral (F1) (ex	xcept MLR	(A 1)	Othe	er (Explain i	n Remarks)		
_ , ,	gen Sulfide (A4)		Loamy Gleye								
	ed Below Dark Su	, ,	Depleted Ma			,	a				
	Dark Surface (A12	,	Redox Dark	` ,		`			hytic vegetati		
-	Mucky Mineral (S	•		k Surface (F7)			wetland hydrology must be present, unless disturbed or problematic.				
	Gleyed Matrix (S		Redox Depre	SSIONS (F8)			unies	s disturbed	or probleman	U	
Type:	Layer (ii preser										
	inches):					Hvd	Iric Soil	Present?	Yes 🗸	No	
Remarks:						,					
HYDROLO	0CV										
	ydrology Indicat	ore:									
			ed; check all that ap	noly)			Secon	dary Indica	tors (2 or mor	e required)	
-	e Water (A1)	or one requir	-	tained Leaves (E	20) (avcant	MIDA		-	d Leaves (B9)		
	Vater Table (A2)			4A, and 4B)	os) (except	INILNA		4A, and 4) (IVILIXA 1, 2,	
	ition (A3)			st (B11)			✓ D	-	terns (B10)		
	Marks (B1)			Invertebrates (B	13)			-	Vater Table (0	C2)	
<u> </u>	ent Deposits (B2)			en Sulfide Odor (•	sible on Aerial	,	
	eposits (B3)			d Rhizospheres a	,	Roots (C3			Position (D2)	3 7 (
	Mat or Crust (B4)			e of Reduced Iro		, (•	nallow Aqui	, ,		
•	eposits (B5)			Iron Reduction in		s (C6)		AC-Neutral	, ,		
Surfac	e Soil Cracks (B6)	Stunted	or Stressed Plan	nts (D1) (LF	RR A)			lounds (D6) (L	_RR A)	
Inunda	ation Visible on Ae	rial Imagery (I	B7) Other (E	xplain in Remark	ks)		. Fr	ost-Heave	Hummocks (D	07)	
Sparse	ely Vegetated Cor	cave Surface	(B8)								
Field Obse	ervations:										
Surface Wa	ater Present?	Yes	No _ 🗸 _ Depth	(inches):							
Water Tabl	le Present?	Yes	No _ 🗸 Depth	(inches):							
Saturation		Yes	No _ ✓ _ Depth	(inches):		Wetland Hy	ydrology	Present?	Yes	No	
	apillary fringe) Recorded Data (str	eam gauge, n	nonitoring well, aeri	al photos, previou	us inspection	ons), if avail	lable:				
	•	- -	-	-	•						
Remarks:											
l											

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Orcas Island Airport		(City/Co	_{unty:} San Juar	n County	_ Sampling Date: 11/	8/13	
Applicant/Owner: Orcas Island Airport (c/o WH Pacific	c, Inc.			State: WA	_ Sampling Point: 2	Sampling Point: 2	
Investigator(s): A. Bachman & S. Braina	ard		Section	, Township, Ra	nge: S11, T37N, R2W	!		
Landform (hillslope, terrace, etc.): Draina					convex, none): Concav		(%): <u>0-5</u>	
					Long: 122°54'33.06"			
Soil Map Unit Name: Sholander-Spieder					NWI classit			
Are climatic / hydrologic conditions on the				_				
Are Vegetation, Soil, or Hy		-			'Normal Circumstances'		No	
Are Vegetation, Soil, or Hy					eeded, explain any answ			
SUMMARY OF FINDINGS - Atta							ures, etc.	
Hydrophytic Vegetation Present?	Yes _ 🗸 _	No		s the Sampled	Area			
Hydric Soil Present?	Yes	No _ / _		within a Wetlar		No _ 🗸		
Wetland Hydrology Present? Remarks:	Yes	No						
VEGETATION – Use scientific n	names of pla		Dami		l Dominous Tostus	ulask and		
Tree Stratum (Plot size:1			Speci	nant Indicator es? Status	Number of Dominant That Are OBL, FACW	Species	(A)	
2					Total Number of Dom Species Across All St		(B)	
4					Percent of Dominant S That Are OBL, FACW		(A/B)	
1					Prevalence Index wo			
2						: Multiply by		
3					-	x 1 =		
4					·	x 2 = x 3 =		
5						x 4 =		
Herb Stratum (Plot size:)					x 5 =		
1. Holcus lanatus		35		<u>Fac</u>		(A)		
2. Trifolium pratense		30	Y	FacU				
3. Poa annua		25	<u>Y</u>	Fac		ex = B/A =		
4. Agrostis tenuis		10	N	Fac Fac	Hydrophytic Vegetat Dominance Test			
5					Prevalence Index			
6						laptations¹ (Provide sup	norting	
7 8					data in Remar	ks or on a separate she	eet)	
9					Wetland Non-Vas	scular Plants ¹		
10					•	ophytic Vegetation ¹ (Ex	. ,	
11.						oil and wetland hydrolo sturbed or problematic.	gy must	
		100	= Total	Cover	be present, unless dis	Turbed of problematic.		
Woody Vine Stratum (Plot size:	,							
1					Hydrophytic Vegetation			
2						'es No		
% Bare Ground in Herb Stratum			_= Fotal	Cover				
Remarks:					1			

OIL		- 1 - 10 - 11						ig Point: 2
	cription: (Describ	_		iment the indicator	or confirm	n the abser	ice of indicators.)	
Depth (inches)	Color (moist)	%	Color (moist)	ox Features Type ¹	Loc ²	Texture	Re	emarks
)-2	10YR 2/2		0 0.0. (0.0.)			Salo	Slightly Moist	
2-16	10YR 4/4					Losa	Slightly Mois	
16-18+	10YR 4/2					Sand	Moist	
10-10+	1011 4/2					Sanu	IVIOISI	_
							<u> </u>	
Гуре: С=С	Concentration, D=D	epletion, RM=	Reduced Matrix, C	CS=Covered or Coat	ed Sand G	rains. 2	Location: PL=Pore L	ining, M=Matrix.
	Indicators: (App	•					ators for Problemat	
_ Histoso	l (A1)		Sandy Redox	(S5)			2 cm Muck (A10)	
	pipedon (A2)	4	Stripped Matri	` '			Red Parent Material (,
	listic (A3)			Mineral (F1) (excep	t MLRA 1)) (Other (Explain in Rem	narks)
	en Sulfide (A4)		Loamy Gleyed					
	ed Below Dark Surf	ace (A11)	Depleted Matr	, ,		31		
	Park Surface (A12)		Redox Dark S	` '			cators of hydrophytic etland hydrology mus	-
-	Mucky Mineral (S1) Gleyed Matrix (S4)	•	Depleted Dark Redox Depres				eliand hydrology mus nless disturbed or pro	•
	Layer (if present)	•	redox Bepred	3010113 (1 0)		1	ileas distarbed or pro	biernatio.
Type:	, , ,							
	nches):					Hydric S	Soil Present? Yes	No 🗸
Remarks:								
YDROLO	OGY							
Vetland Hy	drology Indicator	s:						
Primary Indi	icators (minimum o	f one required	; check all that app	oly)		Se	econdary Indicators (2	or more required
Surface	e Water (A1)		Water-St	ained Leaves (B9) (except ML	RA	_ Water-Stained Lea	ves (B9) (MLRA 1
High W	ater Table (A2)		1, 2, 4	IA, and 4B)			4A, and 4B)	
Saturat	ion (A3)		Salt Crus	it (B11)			Drainage Patterns	(B10)
Water N	Marks (B1)		Aquatic I	nvertebrates (B13)			Dry-Season Water	Table (C2)
Sedime	ent Deposits (B2)		Hydroger	n Sulfide Odor (C1)			Saturation Visible of	n Aerial Imagery (
Drift De	eposits (B3)		Oxidized	Rhizospheres along	Living Ro	ots (C3)	_ Geomorphic Position	on (D2)
Algal M	lat or Crust (B4)		Presence	e of Reduced Iron (C	4)		_ Shallow Aquitard ([03)
Iron De	posits (B5)		Recent Ir	on Reduction in Tille	ed Soils (C	6)	FAC-Neutral Test (D5)
Surface	Soil Cracks (B6)		Stunted of	or Stressed Plants (D	01) (LRR A	N)	Raised Ant Mounds	s (D6) (LRR A)
	tion Visible on Aeria			(plain in Remarks)			Frost-Heave Humm	nocks (D7)
	ly Vegetated Conca	ave Surface (B	88)					
ield Obse								
Surface Wa	ter Present?			nches):				
Vater Table				nches):				
Saturation F includes ca	Present? apillary fringe)	Yes N	lo _ 🗸 _ Depth (ii	nches):	Wetl	land Hydrol	ogy Present? Yes	No
		ım gauge, moi	nitoring well, aeria	photos, previous in	spections),	, if available	:	
Remarks:								

Project/Site: Orcas Island Airport		(City/Coun	_{ity:} San Juar	n County	Sampling	Date: 11/8/1	13
Applicant/Owner: Orcas Island Airport					State: WA	Sampling	Point: 3	
Investigator(s): A. Bachman & S. Brain	ard	;	Section, 1	Γownship, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drain					convex, none): Concave		Slope (%)): <u>0-5</u>
Subregion (LRR): LRR-A		Lat: 48°4	42'17.96'	"N	Long: 122°54'33.06"\	N	Datum:	
Soil Map Unit Name: Sholander-Spiede					NWI classifi			
Are climatic / hydrologic conditions on the	e site typical for th	is time of yea						
Are Vegetation, Soil, or H	lydrology	significantly	disturbed	? Are "	Normal Circumstances"	present? '	Yes _ 🗸 _ 1	No
Are Vegetation, Soil, or H					eded, explain any answ	ers in Rema	arks.)	
SUMMARY OF FINDINGS - Att	tach site map	showing	sampli	ing point l	ocations, transects	s, import	ant feature	es, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸 _ N	No	la	the Compled	A			
Hydric Soil Present?	Yes _ 🗸 _ N	No		the Sampled thin a Wetlar		No_		
Wetland Hydrology Present?	Yes _ 🗸 _ N	No		umi a wenai	100			
Remarks:								
VECETATION Has a significant		-1-						
VEGETATION – Use scientific	names of plar		D	at targertan	I Barriana Tantana			
Tree Stratum (Plot size:)	Absolute % Cover		nt Indicator Status	Dominance Test work Number of Dominant S			
1					That Are OBL, FACW,	or FAC:	1	_ (A)
2					Total Number of Domi	nant		
3					Species Across All Str		1	_ (B)
4					Percent of Dominant S	species		
Sapling/Shrub Stratum (Plot size:)	-	= Total C	Cover	That Are OBL, FACW,	or FAC:	100	_ (A/B)
1					Prevalence Index wo	rksheet:		
2					Total % Cover of:		Multiply by:	
3					OBL species	x 1	=	
4					FACW species			
5					FAC species			
Herb Stratum (Plot size:	1		= Total C	Cover	FACU species			
1. Juncus effusus	/	90	Υ	FacW	UPL species			
2. Holcus lanatus		10	N	FAC	Column Totals:	(A)	-	(D)
3.					Prevalence Index	x = B/A =		
4					Hydrophytic Vegetati		ors:	
5					Dominance Test is			
6					Prevalence Index			
7					Morphological Ada data in Remark	aptations (I s or on a s	Provide suppo eparate sheet	orting t)
8					Wetland Non-Vaso			•
9					Problematic Hydro	phytic Veg	etation1 (Expl	ain)
10					¹ Indicators of hydric so			must
···	-	400	= Total C	over	be present, unless dist	urbed or pr	oblematic.	
Woody Vine Stratum (Plot size:)		101410					
1					Hydrophytic			
2					Vegetation Present? Ye	es_ 🗸 _	No	
% Bare Ground in Herb Stratum			= Total C	over				
Remarks:					<u> </u>			

Profile Desc	rintion: (Describ	e to the d	anth nece	led to document the indicator or confire	n the absence	Sampling Point: 3
Depth	Matrix	e to the ut	spin need	Redox Features	ii tile abselle	e of indicators.)
(inches)	Color (moist)	%	Cole	or (moist) % Type ¹ Loc ²	Texture	Remarks
0-4	10YR 2/2				Or. Salo	Saturated
4-18+	10YR 4/1				Lo sa	Saturated
- 101	1011(4/1				<u> </u>	Cataratea
					· 	_
					·	
		_				• -
	-					-
					· 	_
, i	•			ed Matrix, CS=Covered or Coated Sand G		ocation: PL=Pore Lining, M=Matrix.
•		icable to a	III LRRs,	unless otherwise noted.)	Indicat	tors for Problematic Hydric Soils ³ :
Histosol	` '			ndy Redox (S5)		cm Muck (A10)
	oipedon (A2)			ripped Matrix (S6)	· 	ed Parent Material (TF2)
Black His	n Sulfide (A4)			amy Mucky Mineral (F1) (except MLRA 1) amy Gleyed Matrix (F2)) (1	her (Explain in Remarks)
	d Below Dark Surfa	nce (A11)		epleted Matrix (F3)		
	ark Surface (A12)	(7 (7 (7 (7)		dox Dark Surface (F6)	³ Indica	tors of hydrophytic vegetation and
Sandy M	lucky Mineral (S1)		De	pleted Dark Surface (F7)		land hydrology must be present,
Sandy G	Bleyed Matrix (S4)		Re	dox Depressions (F8)		ess disturbed or problematic.
	aver /if present).					
Restrictive L	_ayer (if present):					
Type:	_ayer (ii present):					
					Hydric So	il Present? Yes <u> </u>
Type:					Hydric So	il Present? Yes <u> </u>
Type: Depth (inc					Hydric So	il Present? Yes <u> </u>
Type: Depth (inc Remarks:	ches):				Hydric So	il Present? Yes <u>V</u> No
Type:	GY drology Indicators	3:				
Type:	GY drology Indicators	3:	red; check		Seco	ondary Indicators (2 or more required)
Type: Depth (inc Remarks: HYDROLO Wetland Hyc Primary Indic Surface	GY drology Indicators cators (minimum of	3:	red; check	_ Water-Stained Leaves (B9) (except ML	Seco	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2,
Type: Depth (inc Remarks: IYDROLO Wetland Hyc Primary Indic Surface High Wa	GY drology Indicators cators (minimum of Water (A1) uter Table (A2)	3:	red; check	_ Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B)	Seco	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
Type:	GY drology Indicators eators (minimum of Water (A1) ater Table (A2) on (A3)	3:	red; check	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11)	<u>Secc</u>	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10)
Type: Depth (inc Remarks: HYDROLOG Wetland Hyd Primary Indic Surface High Wa V Saturatio Water M	GY drology Indicators cators (minimum of Water (A1) hter Table (A2) on (A3) larks (B1)	3:	red; check	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13)	Seco	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2)	3:	red; check	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Seco	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9)
Type: Depth (incomplete in the complete	GY drology Indicators cators (minimum of Water (A1) tter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3)	3:	red; check	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro	Seco	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
Type:	GY drology Indicators eators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) oosits (B3) at or Crust (B4)	3:	red; check	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5)	3:	red; check	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5)
Type:	GY drology Indicators eators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6)	s: one requi	_	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Stunted or Stressed Plants (D1) (LRR A	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	ches):	s: one requi	_ _ _ (B7)	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5)
Type:	GY drology Indicators cators (minimum of Water (A1) Inter Table (A2) Inter Table (A2) Inter Deposits (B2) Inter Deposits (B3) Inter Table (B4) Inter Table (B4) Inter Table (B4) Inter Table (B5) Inter Table (B4) Inter Table (B4) Inter Table (B5) Inter Table (B6) Inter Table (B6	s: one requi	_ _ _ (B7)	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Stunted or Stressed Plants (D1) (LRR A	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aeria v Vegetated Conca	s: one requi		Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Stunted or Stressed Plants (D1) (LRR A Other (Explain in Remarks)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) on Visible on Aeria of Vegetated Concators wations: er Present?	s: one requil I Imagery (ve Surface		Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Stunted or Stressed Plants (D1) (LRR A Other (Explain in Remarks)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	GY drology Indicators eators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) on Visible on Aeria of Vegetated Conca vations: er Present? Present?	I Imagery (ve Surface Yes Yes	(B7) e (B8) _ No _ No	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Stunted or Stressed Plants (D1) (LRR A Other (Explain in Remarks)	ots (C3)	Ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A) Frost-Heave Hummocks (D7)
Type:	GY drology Indicators cators (minimum of Water (A1) Inter Table (A2) Inter Table (A2) Inter Table (B4) Inte	I Imagery (ve Surface Yes Yes	(B7) e (B8) _ No _ No	Water-Stained Leaves (B9) (except ML 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Stunted or Stressed Plants (D1) (LRR A Other (Explain in Remarks)	ots (C3)	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)

Project/Site: Orcas Island Airport		(City/Co	_{ounty:} San Juai	n County	Sampling	g Date: 11/	/8/13
Applicant/Owner: Orcas Island Airpor					State: WA	_ Sampline	g Point: 4	
Investigator(s): A. Bachman & S. Bra	inard		Sectio	n, Township, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drai	nageways		Local	relief (concave,	convex, none): Concav	e	Slope	(%): <u>0-5</u>
Subregion (LRR): LRR-A		Lat: 48°4	42'17.	96"N	Long: 122°54'33.06"	N	Datum:	
Soil Map Unit Name: Sholander-Spied	den complex, 0 to	o 5 percent sl	opes		NWI classifi	cation:		
Are climatic / hydrologic conditions on t	he site typical for	this time of yea	ar? Ye	es _ 🗸 _ No _	(If no, explain in	Remarks.)		
Are Vegetation, Soil, or	Hydrology	_ significantly	disturb	oed? Are	"Normal Circumstances"	present?	Yes_ 🗸	_ No
Are Vegetation, Soil, or	Hydrology	_ naturally pro	blema	tic? (If ne	eeded, explain any answ	ers in Rem	arks.)	
SUMMARY OF FINDINGS - A	ttach site ma	p showing	sam	pling point l	ocations, transect	s, impor	tant feat	ures, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸	No		le the Sampled	I Aroa			
Hydric Soil Present?	Yes	No 🗸		Is the Sampled within a Wetlan		No_	~	
Wetland Hydrology Present?	Yes	No		within a wetta	100			
Remarks:								
VECETATION . Has a significant								
VEGETATION – Use scientific	names of pia	Absolute	Dom	inant Indicator	Deminence Test wer	lsah aat:		
Tree Stratum (Plot size:)			inant indicator	Dominance Test wor Number of Dominant S			
1					That Are OBL, FACW,		1	(A)
2					Total Number of Domi	nant		
3					Species Across All Str	ata:	1	(B)
4				-1.0	Percent of Dominant S		400	
Sapling/Shrub Stratum (Plot size:)		_= lot	al Cover	That Are OBL, FACW,	or FAC:	100	(A/B)
1.					Prevalence Index wo	rksheet:		
2					Total % Cover of:		Multiply b	<u>y:</u>
3					OBL species			
4					FACW species			
5					FAC species			
Herb Stratum (Plot size:)		_= lot	al Cover	FACU species			
1. Poa annua	,	70	Υ	Fac	Column Totals:			
2. Holcus lanatus		10	N	Fac	Column Fotals:	(//)		(D)
3. Trifolium pratense		10	N	FacU	Prevalence Inde			
4					Hydrophytic Vegetat		tors:	
5					✓ Dominance Test in Prevalence Index			
6					Morphological Ad		Provido cu	pporting
7					data in Remark	s or on a s	separate sh	eet)
8 9					Wetland Non-Vas	cular Plant	s ¹	
10					Problematic Hydro	ophytic Ve	getation ¹ (E	xplain)
11.					¹ Indicators of hydric so be present, unless dis			ogy must
		90	= Tota	al Cover	be present, unless dis	urbed or p	iobiemanc.	
Woody Vine Stratum (Plot size:	•							
1					Hydrophytic Vegetation			
2						es _ 🗸 _	No	_
% Bare Ground in Herb Stratum			_= 1 Ota	al Cover				
Remarks:	=				1			

SOIL						Sai	mpling Point:	4
Profile Description: (Descri	be to the depth	needed to documen	t the indicator o	r confirm	the absence	of indicator	s.)	
Depth <u>Matrix</u>	<u> </u>	Redox Fe	eatures					
(inches) Color (moist)	%	Color (moist)	% Type ¹	Loc ²	<u>Texture</u>	· <u></u>	Remarks	
0-1 10YR 2/2		, .			Sa lo	moist		
1-18+ 10YR 4/4					Lo sa	moist, se	epage at 1	7"
¹ Type: C=Concentration, D=D	enletion RM=R	educed Matrix CS=C	overed or Coated	I Sand Gr	ains ² l o	cation: PL=P	ore Lining M	=Matrix
Hydric Soil Indicators: (App				· cana cr		ors for Proble		
Histosol (A1)		Sandy Redox (S5)			2 c	m Muck (A10))	
Histic Epipedon (A2)		Stripped Matrix (S6)		Re	d Parent Mate	erial (TF2)	
Black Histic (A3)		Loamy Mucky Mine		MLRA 1)	Oth	ner (Explain in	Remarks)	
Hydrogen Sulfide (A4)	iooo (A11)	Loamy Gleyed Matrix (F)						
Depleted Below Dark Surf Thick Dark Surface (A12)	ace (ATT)	Depleted Matrix (F3 Redox Dark Surface	•		³ Indicat	ors of hydropl	hytic vegetation	n and
Sandy Mucky Mineral (S1)	Depleted Dark Surf	` '			and hydrology		
Sandy Gleyed Matrix (S4)		Redox Depressions				ss disturbed o		
Restrictive Layer (if present)):							
71 -		_						
Depth (inches):		<u> </u>			Hydric Soi	I Present?	Yes	No
Remarks:								
HYDROLOGY								
Wetland Hydrology Indicator								
Primary Indicators (minimum o	of one required; of					ndary Indicate		
Surface Water (A1)		· 	Leaves (B9) (ex	cept MLF	RA \	Water-Stained		(MLRA 1, 2,
High Water Table (A2)		1, 2, 4A, ar			-	4A, and 4E		
Saturation (A3) Water Marks (B1)		Salt Crust (B1 Aquatic Inverte	•			Orainage Patte Ory-Season W	, ,	.2)
Sediment Deposits (B2)		Hydrogen Sulf	` ,			-		Imagery (C9)
Drift Deposits (B3)		, ,	ospheres along L	ivina Roo				inagory (00)
Algal Mat or Crust (B4)			educed Iron (C4)	-		Shallow Aquita		
Iron Deposits (B5)		Recent Iron R	eduction in Tilled	Soils (C6) F	- FAC-Neutral T	est (D5)	
Surface Soil Cracks (B6)		Stunted or Str	essed Plants (D1) (LRR A)) <u>,</u> F	Raised Ant Mo	ounds (D6) (L	RR A)
Inundation Visible on Aeri	0, , ,	Other (Explain	in Remarks)		, F	rost-Heave H	łummocks (D	7)
Sparsely Vegetated Conc	ave Surface (B8)							
Field Observations:								
Surface Water Present?		_ Depth (inches						
Water Table Present?		Depth (inches						
Saturation Present? (includes capillary fringe)		Depth (inches		="		y Present?	Yes	No
Describe Recorded Data (stream	am gauge, monit	oring well, aerial phot	os, previous insp	ections),	if available:			
Remarks:								

Project/Site: Orcas Island Airport	(City/Co	_{unty:} San Juar	n County	Sampling	Date: 11/8/1	3
Applicant/Owner: Orcas Island Airport (c/o WH Pacific, I				State: WA	Sampling	Point: 5	
Investigator(s): A. Bachman & S. Brainard		Section	, Township, Ra	nge: S11, T37N, R2W			
				convex, none): Concave		Slope (%)	· <u>0-5</u>
Subregion (LRR): LRR-A	Lat: _48°	42'17.9	96"N	Long: 122°54'33.06"W	V	Datum:	
Soil Map Unit Name: Sholander-Spieden complex, 0 to 5				NWI classific			
Are climatic / hydrologic conditions on the site typical for thi	s time of ve	ar? Ye					
Are Vegetation, Soil, or Hydrologys	-			'Normal Circumstances" p		Yes ✔ N	lo
Are Vegetation, Soil, or Hydrologyr				eded, explain any answe			
SUMMARY OF FINDINGS – Attach site map							es, etc.
Hydrophytic Vegetation Present? Yes _ ✔ _ N	lo						
Hydric Soil Present? Yes _ V _ N			Is the Sampled within a Wetlar		No		
Wetland Hydrology Present? Yes _ V _ N	lo	'	within a wetiar	ia? res	NO_	_	
Remarks:							
VEGETATION – Use scientific names of plan	ıts.						
Tree Stratum (Plot size:)	Absolute		nant Indicator es? Status	Dominance Test work			
1				Number of Dominant S That Are OBL, FACW,	pecies or FAC:	3	(A)
2				Total Number of Domin	ant		
3				Species Across All Stra	ıta:	3	(B)
4			l Cover	Percent of Dominant Sp That Are OBL, FACW,		100	(A/B)
Sapling/Shrub Stratum (Plot size:) 1				Prevalence Index wor	ksheet:		
2				Total % Cover of:		Multiply by:	
3.				OBL species			
4.				FACW species	x 2	2 =	
5				FAC species	x 3	3 =	_
		_ = Tota	l Cover	FACU species	x 4	1 =	_
Herb Stratum (Plot size:) 1. Juncus ensifolius	30	V	FacW	UPL species	x 5	5 =	_
2. Juncus effusus	30	<u>'</u>	FacW	Column Totals:	(A)		(B)
3. Juncus acuminatus	20	<u>'</u> Y	Obl	Prevalence Index	= B/A =		
4 Sisyrinchium californicum	10	N	FacW	Hydrophytic Vegetation			_
5. Holcus lanatus	10	N	Fac	Dominance Test is			
6.				Prevalence Index is	s ≤3.0¹		
7.				Morphological Ada	ptations ¹ (Provide suppo	rting
8.				data in Remarks)
9.				Wetland Non-Vasc			
10				Problematic Hydro	. , .		,
11				¹ Indicators of hydric soi be present, unless distu			must
	100	_= Total	Cover	, ,			
Woody Vine Stratum (Plot size:)							
1				Hydrophytic Vegetation			
2					s_ <u> </u>	No	
% Bare Ground in Herb Stratum		_= 10181	COVEI				
Remarks:				1			

SOIL										Sampling Point: 5
Profile Desc	ription: (Descril	oe to the de	oth nee	ded to docur	nent the i	ndicator	or confirm	the abs	sence	of indicators.)
Depth	Matrix			Redo	x Feature:					
(inches)	Color (moist)	%	Col	or (moist)	%	Type ¹	Loc ²	Text		Remarks
0-4	10YR 2/2							Or. S	alo	Saturated
4-18+	10YR 4/1							Lo sa	<u> </u>	Saturated
					_					
					<u> </u>					
1Typo: C-Co	oncentration, D=D	unlation PM		and Matrix CS	S-Covered	d or Coata	ud Sand Gr	oine.	² l 00	ration: PL=Pore Lining, M=Matrix.
	ndicators: (App						a Janu Gi			rs for Problematic Hydric Soils ³ :
Histosol	` '			andy Redox (•			_	_	n Muck (A10)
	pipedon (A2)			ripped Matrix	` '					Parent Material (TF2)
Black His	` '			amy Mucky N			MLRA 1)		Othe	er (Explain in Remarks)
	n Sulfide (A4)	(8.4.4)		amy Gleyed)				
	Below Dark Surf	ace (A11)		epleted Matrix	` '			31		
	rk Surface (A12)	١		edox Dark Su epleted Dark \$. ,	·7\		ır		rs of hydrophytic vegetation and
-	lucky Mineral (S1 leyed Matrix (S4)			edox Depress	,	7)				nd hydrology must be present, s disturbed or problematic.
	_ayer (if present)		IX.	edux Depress	ions (Fo)			1	unies	s disturbed of problematic.
	ayer (ii present)	•								
Type:	-h \.							11	- 0-!!	Bussell Van V Na
Depth (inc	nes)							пуш	C SOII	Present? Yes No No
Remarks:										
HYDROLO										
	drology Indicatorators (minimum c		d: chec	k all that appl	v)				Secon	dary Indicators (2 or more required)
-	Water (A1)			Water-Sta		es (R9) (e	xcent MI F			ater-Stained Leaves (B9) (MLRA 1, 2,
· ·	ter Table (A2)		_		A, and 4B)	` , `	xoopt iii.z.		—	4A, and 4B)
✓ Saturation				Salt Crust		,			D	rainage Patterns (B10)
	arks (B1)			Aquatic In	` '	s (B13)				ry-Season Water Table (C2)
	it Deposits (B2)			Hydrogen		,				aturation Visible on Aerial Imagery (C9)
	oosits (B3)		_				Living Roc	ots (C3)		eomorphic Position (D2)
	it or Crust (B4)			Presence		_	_	10 (00)		hallow Aquitard (D3)
•	osits (B5)			Recent Iro		`	,	;)		AC-Neutral Test (D5)
	Soil Cracks (B6)		_	Stunted or			•	,		aised Ant Mounds (D6) (LRR A)
	on Visible on Aeri	al Imagen, (F	R7)	Other (Exp			·/ (LIXIX A	,		rost-Heave Hummocks (D7)
	Vegetated Conc	• • •	•	011101 (EX	Jan III IV	marko)				ost fleave flammooks (27)
Field Observ			()							
Surface Water		Yes	No	_ Depth (inc	ches):					
Water Table				Depth (ind			_			
Saturation Pr				Depth (inc				and Hvd	rology	/ Present? Yes _ V No
(includes cap					,				-	,
Pescine Vec	Jordon Data (Silet	anı gauge, III	OTHIOTHI!	y won, acrial	ρεισίσο, μι	ovious IIIS	poolions),	ıı avallal	JIU.	

Remarks:

Project/Site: Orcas Island Airport		(City/Co	_{unty:} <u>San Jua</u> i	n County	Samplir	ng Date: 11/8	3/13
Applicant/Owner: Orcas Island Airport (c/	o WH Pacific, I	nc.			State: WA	Samplin	ng Point: 6	
Investigator(s): A. Bachman & S. Brainar	d		Section	, Township, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drainag	jeways		Local r	elief (concave,	convex, none): Concave	Э	Slope (%): <u>0-5</u>
Subregion (LRR): LRR-A		Lat: 48°	42'17.9	06"N	_ Long: 122°54'33.06"\	Ν	Datum: _	
Soil Map Unit Name: Sholander-Spieden	complex, 0 to 5	5 percent sl	opes		NWI classifi	cation:		
Are climatic / hydrologic conditions on the s	site typical for this	s time of yea	ar? Ye					
Are Vegetation, Soil, or Hyd	drologys	significantly	disturbe	ed? Are '	"Normal Circumstances"	present?	Yes_ 🗸 _	No
Are Vegetation, Soil, or Hyd	drologyr	naturally pro	blemati	c? (If ne	eeded, explain any answ	ers in Ren	narks.)	
SUMMARY OF FINDINGS - Atta	ch site map	showing	samp	oling point l	ocations, transects	s, impo	rtant featu	ıres, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸 _ N	lo		lo the Complet	I Area			
Hydric Soil Present?	Yes _ 🗸 _ N	lo		ls the Sampled within a Wetlar		, No)	
, ,,	Yes N	lo		Within a Wethan			<u> </u>	
Remarks:								
VEGETATION – Use scientific na	ames of plan							
Tree Stratum (Plot size:)	Absolute % Cover		nant Indicator es? Status	Dominance Test wor			
1					Number of Dominant S That Are OBL, FACW,		2	(A)
2					Total Number of Domi		2	
3					Species Across All Str	ata:	2	(B)
4				l Cover	Percent of Dominant S That Are OBL, FACW,		100	(A/B)
1					Prevalence Index wo	rksheet:		
2.					Total % Cover of:		Multiply by	<u>:</u>
3.					OBL species	x	1 =	
4					FACW species	x	2 =	
5					FAC species			
Llank Charles (Dlat alan	`		_= Tota	l Cover	FACU species			
Herb Stratum (Plot size:	_)	50	Υ	FacW	UPL species			
2. Juncus effusus		20	Υ	FacW	Column Totals:	(A	·)	(B)
3. Holcus lanatus		15	N	Fac	Prevalence Index	κ = B/A =		
4.					Hydrophytic Vegetati	on Indica	ators:	
5					Dominance Test is	3 >50%		
6					Prevalence Index			
7					Morphological Ada data in Remark			
8					Wetland Non-Vase			: C 1)
9					Problematic Hydro			nlain)
10					¹ Indicators of hydric so			
11		<u>~-</u>			be present, unless dist			gy muot
Woody Vine Stratum (Plot size:)	85	_= Total	Cover				
1	*				Hydrophytic			
2.					Vegetation	,		
			= Total		Present? Ye	es	No	_
% Bare Ground in Herb Stratum								
Remarks:								
I								

							Sampling Point: 6
Profile Desc	ription: (Describ	e to the c	depth nee	eded to document the indicator or	confirm	the absence	e of indicators.)
Depth	Matrix	0/		Redox Features	. 2	- .	B .
(inches)	Color (moist)	%_	<u>Co</u>	lor (moist) % Type ¹	Loc ²	<u>Texture</u>	Remarks
0-4	10YR 2/2					Or. Salo	Saturated
4-18+	10YR 4/1					Lo sa	Saturated
Type: C=Cd	oncentration D=De	enletion F	Redu	ced Matrix, CS=Covered or Coated S	Sand Gr	rains ² l o	cation: PL=Pore Lining, M=Matrix.
•		•		, unless otherwise noted.)	Sana On		ors for Problematic Hydric Soils ³ :
Histosol				andy Redox (S5)			m Muck (A10)
	oipedon (A2)			tripped Matrix (S6)		·	d Parent Material (TF2)
Black Hi				oamy Mucky Mineral (F1) (except M	LRA 1)	·	ner (Explain in Remarks)
Hydroge	en Sulfide (A4)		L	oamy Gleyed Matrix (F2)			
	d Below Dark Surfa	ace (A11)		epleted Matrix (F3)			
	ark Surface (A12)		•	edox Dark Surface (F6)			ors of hydrophytic vegetation and
-	Mucky Mineral (S1)			epleted Dark Surface (F7)			and hydrology must be present,
	Gleyed Matrix (S4) Layer (if present):		. K	edox Depressions (F8)		unie	ss disturbed or problematic.
	Lavei (III bi eseii().						
	, ,						
Туре:						Illiandada Ond	1 Day 2000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Туре:	ches):					Hydric Soi	I Present? Yes V No
Type: Depth (inc						Hydric Soi	I Present? Yes V No
Type:	ches):					Hydric Soi	I Present? Yes V No
Type:	ches):					Hydric Soi	I Present? Yes No
Type: Depth (inc Remarks: YDROLO Wetland Hyd	ches):	s:	uired; chec	ck all that apply)			I Present? Yes No No
Type: Depth (ind Remarks: YDROLO Vetland Hyd Primary Indic Surface	GY drology Indicators cators (minimum of	s:	uired; chec	ck all that apply) Water-Stained Leaves (B9) (exc	ept MLR	Seco	
Type: Depth (ind Remarks: YDROLO Wetland Hyd Primary India Surface High Wa	GY drology Indicators cators (minimum of Water (A1) ater Table (A2)	s:	uired; ched		ept MLR	Seco	endary Indicators (2 or more required)
Type: Depth (ind Remarks: YDROLO Wetland Hyd Primary India Surface High Wa	GY drology Indicators cators (minimum of Water (A1) ater Table (A2)	s:	uired; chec	Water-Stained Leaves (B9) (exc	ept MLR	<u>Secc</u>	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2
Type: Depth (ind Remarks: YDROLO Wetland Hyd Primary Indic Surface High Wa Saturatic Water M	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1)	s:	uired; chec	Water-Stained Leaves (B9) (exc. 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13)	ept MLR	Seco RA \ [[undary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2)
Type: Depth (inc Remarks: YDROLO Wetland Hyd Primary Indic Surface High Wa Saturatio Water M Sedimer	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2)	s:	uired; chec	Water-Stained Leaves (B9) (exc. 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)		Seco	undary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS
Type: Depth (ind Remarks: YDROLO Vetland Hyd Primary Indic Surface High Wa V Saturatic Water M Sedimer Drift Dep	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3)	s:	uired; chec	Water-Stained Leaves (B9) (exce 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv		Secondary Second	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2)
Type:	GY drology Indicators eators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)	s:	uired; chec	Water-Stained Leaves (B9) (exce 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4)	ving Roo	Second Se	endary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5)	s:	uired; chec	Water-Stained Leaves (B9) (excertifications) (excer	ving Roo Soils (C6	Second Se	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6)	s: one requ	-	Water-Stained Leaves (B9) (exceeding 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Signature (D1)	ving Roo Soils (C6	Secondary Second	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	ches): drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aeria	s: one requ	- - - (B7) _	Water-Stained Leaves (B9) (excertifications) (excer	ving Roo Soils (C6	Secondary Second	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aeria of Vegetated Conca	s: one requ	- - - (B7) _	Water-Stained Leaves (B9) (exceeding 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Signature (D1)	ving Roo Soils (C6	Secondary Second	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) on Deposits (B2) osits (B3) at or Crust (B4) osits (B5) Soil Cracks (B6) on Visible on Aeria vegetated Conca	s: one requ	- (B7) _ ce (B8)	Water-Stained Leaves (B9) (excertifications) Nation (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Stunted or Stressed Plants (D1) Other (Explain in Remarks)	ving Roo Soils (C6	Secondary Second	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) Soil Cracks (B6) on Visible on Aeria v Vegetated Conca vations: er Present?	s: one requ I Imagery ve Surfac	- (B7) _ :e (B8) No _	Water-Stained Leaves (B9) (excert 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Stunted or Stressed Plants (D1) Other (Explain in Remarks) Depth (inches):	ving Roo Soils (C6	Secondary Second	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)
Type:	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aeria v Vegetated Conca vations: er Present? Present?	I Imagery ve Surface Yes	- (B7) _ ce (B8) No No	Water-Stained Leaves (B9) (excertifications) Water-Stained Leaves (B9) (excertifications) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Stunted or Stressed Plants (D1) Other (Explain in Remarks) Depth (inches): Depth (inches):	ring Roo Soils (C6 (LRR A)	Secondary Second	And AB) Orainage Patterns (B10) Orainage Patterns (B10) Ory-Season Water Table (C2) Saturation Visible on Aerial Imagery (Cs) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A) Frost-Heave Hummocks (D7)
Type: Depth (ind Remarks: YDROLO Vetland Hyd Primary Indic Surface High Wa Saturatic Water M Sedimer Drift Dep Algal Ma Iron Dep Surface Inundatic Sparsely Surface Water Courface Water Surface Water Table Saturation Price Saturation Price Saturation Price Depth (ind Second Price Second Price Depth (ind	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aeria v Vegetated Conca vations: er Present? Present?	I Imagery ve Surface Yes	- (B7) _ ce (B8) No No	Water-Stained Leaves (B9) (excert 1, 2, 4A, and 4B) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Stunted or Stressed Plants (D1) Other (Explain in Remarks) Depth (inches):	ring Roo Soils (C6 (LRR A)	Secondary Second	Andary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)

Project/Site: Orcas Island Airport		(City/Co	_{unty:} San Juai	n County	_ Samplinç	g Date: 11/8/	/13
Applicant/Owner: Orcas Island Airpo	rt (c/o WH Pacif	ic, Inc.			State: WA	_ Samplino	g Point: 7	
Investigator(s): A. Bachman & S. Bra	ainard		Section	ı, Township, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Dra					convex, none): Concav		Slope (%	6): <u>0-5</u>
		Lat: 48°	42'17.9	96"N	Long: 122°54'33.06"	W	Datum:	
Soil Map Unit Name: Sholander-Spie					NWI classif			
Are climatic / hydrologic conditions on				_				
Are Vegetation, Soil, or		_			"Normal Circumstances"		Yes 🗸	No
Are Vegetation, Soil, o					eeded, explain any answ			_
SUMMARY OF FINDINGS –							,	res, etc.
Hydrophytic Vegetation Present?	Yes	No _ 🗸		Is the Sampled	I Area			
Hydric Soil Present?	Yes	_ No _ 🗸		within a Wetlar		No_	✓	
Wetland Hydrology Present? Remarks:	Yes	No _ 🗸						
VEGETATION – Use scientific	c names of p	lants. Absolute	Domi	nant Indicator	Dominance Test wo	rkshoot:		
Tree Stratum (Plot size:	,	% Cover	Speci	es? Status	Number of Dominant That Are OBL, FACW	Species	2	(A)
2					Total Number of Dom Species Across All St		2	(B)
4					Percent of Dominant S That Are OBL, FACW		100	(A/B)
1					Prevalence Index wo			
2					Total % Cover of:			
3					OBL species			
4					FACW species			
5					FAC species			
Herb Stratum (Plot size:)		_ = 10ta	ii Cover	UPL species			
1. Poa annua	, 	95	Υ	Fac	Column Totals:			
2						()		(-)
3					Prevalence Inde			
4					Hydrophytic Vegetat		ors:	
5					✓ Dominance Test			
6					Morphological Ad		(Drovido oupr	oorting
7					data in Remar			
8					Wetland Non-Vas	cular Plant	s ¹	
9 10					Problematic Hydr	ophytic Veç	getation ¹ (Exp	olain)
11.					¹ Indicators of hydric s			y must
· · · ·			= Total	Cover	be present, unless dis	turbed or p	roblematic.	
Woody Vine Stratum (Plot size:)			20101				
1					Hydrophytic			
2					Vegetation Present? Y	es 🗸	No	
% Rare Ground in Harb Stratum			_= Total	Cover				-
% Bare Ground in Herb Stratum Remarks:					1			

OIL		Sampling Point: 7	
Profile Description: (Describe to the	depth needed to document the indicator or co	nfirm the absence of indicators.)	
Depth <u>Matrix</u>	Redox Features		
(inches) Color (moist) %	Color (moist) % Type ¹ Loc	Texture Remarks	
0-16+ <u>10YR 4/4</u>		Lo sa Moist	
			
			
Type: C=Concentration D=Depletion I			rix.
Hydric Soil Indicators: (Applicable to		Indicators for Problematic Hydric Soi	
Histosol (A1)	Sandy Redox (S5)	2 cm Muck (A10)	
Histic Epipedon (A2)	Stripped Matrix (S6)	Red Parent Material (TF2)	
Black Histic (A3)	Loamy Mucky Mineral (F1) (except MLR		
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	,	
Depleted Below Dark Surface (A11)			
Thick Dark Surface (A12)	Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation an	d
Sandy Mucky Mineral (S1)	Depleted Dark Surface (F7)	wetland hydrology must be present,	
Sandy Gleyed Matrix (S4)	Redox Depressions (F8)	unless disturbed or problematic.	
Restrictive Layer (if present):	. ,	'	
Type:			
Depth (inches):		Hydric Soil Present? Yes No	~
Remarks:			
YDROLOGY			
Wetland Hydrology Indicators:			
Primary Indicators (minimum of one requ	uired; check all that apply)	Secondary Indicators (2 or more requ	<u>uired)</u>
Surface Water (A1)	Water-Stained Leaves (B9) (except	t MLRA Water-Stained Leaves (B9) (MLF	RA 1,
High Water Table (A2)	1, 2, 4A, and 4B)	4A, and 4B)	
Saturation (A3)	Salt Crust (B11)	Drainage Patterns (B10)	
Water Marks (B1)	Aquatic Invertebrates (B13)	Dry-Season Water Table (C2)	
Sediment Deposits (B2)	Hydrogen Sulfide Odor (C1)	Saturation Visible on Aerial Imag	ery (C
Drift Deposits (B3)		Roots (C3) Geomorphic Position (D2)	
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)	Shallow Aquitard (D3)	
Iron Deposits (B5)	Recent Iron Reduction in Tilled Soil		
			. \
Surface Soil Cracks (B6)	Stunted or Stressed Plants (D1) (LF	,	()
Inundation Visible on Aerial Imagery	(B7) Other (Explain in Remarks)	Frost-Heave Hummocks (D7)	
0 11/ // 10	(50)		
Sparsely Vegetated Concave Surface	ce (B8)		
Field Observations:			
Field Observations:	No Depth (inches):		
Field Observations: Surface Water Present? Yes			
Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes	No Depth (inches):	Wetland Hydrology Present? Yes No	, <u> </u>
Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes (includes capillary fringe)	No Depth (inches): No Depth (inches):		, <u> </u>
Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge)	No Depth (inches): No Depth (inches): No Depth (inches):		, <u> </u>
Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge)	No Depth (inches): No Depth (inches): No Depth (inches):		, <u>v</u>
Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge)	No Depth (inches): No Depth (inches): No Depth (inches):)_V
Field Observations: Surface Water Present? Water Table Present? Saturation Present? Yes Yes (includes capillary fringe)	No Depth (inches): No Depth (inches): No Depth (inches):		, <u> </u>

Project/Site: Orcas Island Airport	(City/Cour	_{nty:} San Juar	n County	_ Sampling Date: 11/8/13	;
Applicant/Owner: Orcas Island Airport (c/o WH Page	cific, Inc.			State: WA	_ Sampling Point: 8	
Investigator(s): A. Bachman & S. Brainard		Section,	Township, Rai	nge: S11, T37N, R2W		
Landform (hillslope, terrace, etc.): Drainageways					Slope (%):	0-5
Subregion (LRR): LRR-A	Lat: 48°	42'17.96	"N	Long: 122°54'33.06"	W Datum:	
Soil Map Unit Name: Sholander-Spieden complex,					ication:	
Are climatic / hydrologic conditions on the site typical	for this time of yea		_			
Are Vegetation, Soil, or Hydrology _	_				present? Yes _ 🗸 _ No)
Are Vegetation, Soil, or Hydrology				eded, explain any answ		
SUMMARY OF FINDINGS – Attach site i						s, etc.
Hydrophytic Vegetation Present? Yes _ 🗸	No					
Hydric Soil Present? Yes _ ✔	No		the Sampled ithin a Wetlar		No	
Wetland Hydrology Present? Yes	No	w	itnin a vvetiar	id? fes	NO	
VEGETATION – Use scientific names of	-					
Tree Stratum (Plot size:)	Absolute % Cover		ant Indicator S? Status	Dominance Test wor		
1				Number of Dominant : That Are OBL, FACW		(A)
2				Total Number of Dom Species Across All St		(B)
4			Cover	Percent of Dominant S That Are OBL, FACW		(A/B)
1				Prevalence Index wo	orksheet:	
2				Total % Cover of:	Multiply by:	_
3				OBL species	x 1 =	_
4				FACW species	x 2 =	_
5				-	x 3 =	
Harb Stratum (Diet size:		= Total	Cover		x 4 =	
Herb Stratum (Plot size:) 1. Holcus lanatus	25	Υ	Fac		x 5 =	
2. Poa annua	20	Υ	Fac	Column Lotals:	(A)	_ (B)
3. Juncus effusus	20	Υ	FacW	Prevalence Inde	ex = B/A =	_
4. Sisyrinchium californicum	20	Υ	FacW	Hydrophytic Vegetat	ion Indicators:	
5		-		Dominance Test i	is >50%	
6				Prevalence Index	is ≤3.0 ¹	
7					aptations ¹ (Provide support ks or on a separate sheet)	ing
8				Wetland Non-Vas	' '	
9					ophytic Vegetation¹ (Explai	n)
10					oil and wetland hydrology n	,
11	0.5				sturbed or problematic.	idot
Woody Vine Stratum (Plot size:)	85	= Total (Cover			
1				Hydrophytic		
2.				Vegetation		
				Present? Y	es No	
% Bare Ground in Herb Stratum						
Remarks:						

Depth Ma	atrix		led to docu r Redo	x Features					
(inches) Color (mo		Colo	or (moist)	<u>%</u> Type	Loc ²	Texture	Remarks		
0-16+ Glay 4/10	Y	10YR	3/6	5		Lo sa	Moist		
· ·									
				·			-		
				·					
									
									
							· -		
				- · <u></u>					
Type: C=Concentration, D	=Depletion, F	RM=Reduce	ed Matrix, CS	S=Covered or Co	ated Sand Gra	ains. ² Lo	ocation: PL=Pore Lining, M=Matrix.		
Hydric Soil Indicators: (A	applicable to	all LRRs,	unless other	rwise noted.)		Indicat	ors for Problematic Hydric Soils ³ :		
Histosol (A1)		•	ndy Redox (S	,			cm Muck (A10)		
Histic Epipedon (A2)			ipped Matrix	` '	MI DA 4\		d Parent Material (TF2)		
Black Histic (A3)Hydrogen Sulfide (A4)			amy Mucky N amy Gleyed I	Mineral (F1) (exc o	ept WLKA 1)	Otr	her (Explain in Remarks)		
Depleted Below Dark S	Surface (A11)		pleted Matrix	, ,					
Thick Dark Surface (A			dox Dark Su			³ Indicat	tors of hydrophytic vegetation and		
Sandy Mucky Mineral			pleted Dark S	` '			and hydrology must be present,		
A On the Oleman I Marketin /	S4)	Re	dox Depress	ions (F8)		unle	ess disturbed or problematic.		
Sandy Gleyed Matrix (
Restrictive Layer (if prese	ent):								
Restrictive Layer (if prese	ent):					Harleta Car	" D		
Restrictive Layer (if prese	ent):					Hydric Soi	il Present? Yes <u> </u>		
Restrictive Layer (if preserve) Type: Depth (inches): Remarks:	ent):					Hydric Soi	il Present? Yes 🔽 No		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks:						Hydric Soi	il Present? Yes 🗸 No		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indica	ators:	uired: check	all that appl	v)					
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicators (minimu	ators:	uired; check		-	(except MLR	Seco	ondary Indicators (2 or more required)		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indica	ators: m of one requ	uired; check	_ Water-Stai	y) ined Leaves (B9)	(except MLR	Seco			
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicators (minimu Surface Water (A1)	ators: m of one requ	uired; check	_ Water-Stai	ined Leaves (B9) A, and 4B)	(except MLR	<u>Secc</u>	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indication Surface Water (A1) High Water Table (A2)	ators: m of one requ	uired; check	_ Water-Stai 1, 2, 4A Salt Crust	ined Leaves (B9) A, and 4B)	` •	<u>Secc</u>	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B)		
Restrictive Layer (if preserved for the preserve	ators: m of one requ	uired; check	Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1)	Secondary 1	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10)		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicates (minimu Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	ators: m of one requ	uired; check	Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor) ng Living Root	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9 Geomorphic Position (D2)		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicates Primary Indicators (minimu Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	ators: m of one requ	uired; check	Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor of Reduced Iron) ng Living Roof (C4)	Secc. A	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (Cs) Geomorphic Position (D2) Shallow Aquitard (D3)		
Restrictive Layer (if preserving property proper	ators: m of one requ	uired; check	Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence 6 Recent Iro	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres aloo of Reduced Iron n Reduction in Ti) ng Living Root (C4) Iled Soils (C6)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5)		
Restrictive Layer (if preserved for preserve	ators: m of one requ	_	Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence of Recent Iro Stunted or	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor of Reduced Iron on Reduction in Ti Stressed Plants	ng Living Root (C4) Iled Soils (C6) (D1) (LRR A)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)		
Restrictive Layer (if preserved for preserve	ators: m of one requ 2) 6) kerial Imagery		Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence of Recent Iro Stunted or	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres aloo of Reduced Iron n Reduction in Ti	ng Living Root (C4) Iled Soils (C6) (D1) (LRR A)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5)		
Restrictive Layer (if preserved for preserve	ators: m of one requ 2) 6) kerial Imagery		Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence of Recent Iro Stunted or	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor of Reduced Iron on Reduction in Ti Stressed Plants	ng Living Root (C4) Iled Soils (C6) (D1) (LRR A)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: Primary Indicators (minimu Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B Sparsely Vegetated Coffield Observations:	ators: m of one requ 2) 6) kerial Imagery		Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence Recent Iro Stunted or Other (Exp	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor of Reduced Iron on Reduction in Ti Stressed Plants plain in Remarks)) ng Living Root (C4) Iled Soils (C6) (D1) (LRR A)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)		
Restrictive Layer (if preserved for preserve	ators: m of one requ 6) herial Imagery oncave Surfac		Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence C Recent Iro Stunted or Other (Exp	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor of Reduced Iron on Reduction in Ti Stressed Plants blain in Remarks)	ng Living Root (C4) Iled Soils (C6) (D1) (LRR A)	Secondary Second	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)		
Restrictive Layer (if preserved for preserve	ators: m of one requ 6) Aerial Imagery oncave Surfact Yes Yes		Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence of Recent Iro Stunted or Other (Exp	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor of Reduced Iron on Reduction in Ti Stressed Plants olain in Remarks) ches):	ng Living Room (C4) Illed Soils (C6) (D1) (LRR A)	Secondaria	Ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A) Frost-Heave Hummocks (D7)		
Restrictive Layer (if preserved) Type: Depth (inches): Remarks: Primary Indicators (minimu Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B Sparsely Vegetated Coffield Observations:	ators: m of one requ 2) 6) verial Imagery oncave Surfact Yes Yes Yes		Water-Stai 1, 2, 4A Salt Crust Aquatic Inv Hydrogen Oxidized F Presence of Recent Iro Stunted or Other (Exp Depth (inc	ined Leaves (B9) A, and 4B) (B11) vertebrates (B13) Sulfide Odor (C1 Rhizospheres alor of Reduced Iron on Reduction in Ti Stressed Plants blain in Remarks) ches):	ng Living Roof C4) lled Soils (C6) (D1) (LRR A)	second A Sec	ondary Indicators (2 or more required) Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (CS) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Raised Ant Mounds (D6) (LRR A)		

Landform (hillslope, terrace, etc.): Drainageways Local relief (concave, convex, none): Concave Slope (%): 0-5 Subregion (LRR): LRR-A Lat: 48°42'17.96"N Long: 122°54'33.06"W Datum: Soil Map Unit Name: Sholander-Spieden complex, 0 to 5 percent slopes Are climatic / hydrologic conditions on the site typical for this time of year? Yes Are Vegetation, Soil, or Hydrology significantly disturbed? Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)	Project/Site: Orcas Island Airport	ject/Site: Orcas Island Airport City/County: S							
Landform (hillstope, terrace, etc.): Drainageways						Sampling	g Point: 9		
Landform (hillslope, terrace, etc.) Drainageways Local relief (concave, corvex, none); COncave Stope (%); 0-5 Subregion (LRR); LRR-A Lat: 48 '421',796'N Long: 122'54'3.06'W Datum:	Investigator(s): A. Bachman & S. Brainard		Section	n, Township, F	Range: S11, T37N, R2W				
Soil Map Unit Name: Shollander-Spieden complex, 0 to 5 percent slopes Are climatic / hydrologic conditions on the site typical for this time of year? Yes No	Landform (hillslope, terrace, etc.): Drainageways		Local	relief (concave	e, convex, none): Concave	t	Slope (%)): <u>0-5</u>	
Are Climatic / hydrologic conditions on the site typical for this time of year? Yes _ V _ No _ (If no, explain in Remarks.) Are Vegetation _ Soil _ or Hydrology _ significantly disturbed? Are Normal Circumstances' present? Yes _ V _ No _ Are Vegetation _ Soil _ or Hydrology _ naturallyl problematie? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes _ V _ No Is the Sampled Area within a Wetland? Yes _ V _ No _ Wetland Hydrology Present? Yes _ V _ No Security _ No _ Wetland Hydrology Present? Yes _ V _ No Wetland Hydrology Present? Yes _ V _ No Wetland? Ye	Subregion (LRR): LRR-A	Lat: 48°	42'17.	96"N	Long: 122°54'33.06"V	J	Datum:		
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _	Soil Map Unit Name: Sholander-Spieden complex, 0 to	5 percent s	lopes		NWI classific	ation:			
Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No Is the Sampled Area within a Wetland? Yes No Within a Wetland? Ye	Are climatic / hydrologic conditions on the site typical for thi	is time of ye	ar? Ye						
SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes V No Welfard Hydrology Present? Yes V No Welfard Hydrology Present? Yes V No Welfard Hydrology Present? Wetland Hydrology Present? VEGETATION — Use scientific names of plants. Tree Stratum (Plot size: Absolute Secretary Secretar	Are Vegetation, Soil, or Hydrology s	significantly	disturb	ed? Ar	e "Normal Circumstances" p	oresent?	Yes_ 🗸 _ 1	No	
Hydrophytic Vegetation Present? Yes V No Is the Sampled Area within a Wetland? Yes V No	Are Vegetation, Soil, or Hydrologyı	naturally pro	blemat	tic? (If	needed, explain any answe	rs in Rem	arks.)		
Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No Wetland? Yes	SUMMARY OF FINDINGS – Attach site map	showing	sam	pling point	locations, transects	, impor	tant feature	es, etc.	
Hydric Soil Present? Yes No Within a Wetland? Yes No	Hydrophytic Vegetation Present? Yes _ V _ N	lo		la the Compl	ad Araa				
VEGETATION - Use scientific names of plants. Absolute	Hydric Soil Present? Yes _ V _ N	lo		_		No			
VEGETATION – Use scientific names of plants. Tree Stratum (Plot size:) Absolute % Cover Species? Status Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 4	, ,,	lo		Within a victi	una. 105				
Absolute Species Species Status Species	Remarks:								
Absolute Species Species Status Species									
Absolute Species Species Status Species									
Tree Stratum (Plot size:	VEGETATION – Use scientific names of plan								
1	Tree Stratum (Plot size:								
3.	1				Number of Dominant S		4	_ (A)	
A.							4		
Sapling/Shrub Stratum (Plot size:					 Species Across All Stra 	ıta:	4	_ (B)	
1.				al Cover			100	_ (A/B)	
2.					Prevalence Index wor	ksheet:			
3	<u> </u>				-		Multiply by:		
4					-				
5. = Total Cover FAC species x 3 =					FACW species	x:	2 =	<u> </u>	
Herb Stratum (Plot size:) Holicus Ianatus					FAC species	x	3 =		
1. Holcus lanatus 2 Poa annua 2 Poa annua 2 O Y Fac 3. Juncus effusus 2 O Y FacW 4. Sisyrinchium californicum 2 O Y FacW 5.			_ = Tota	al Cover					
2. Poa annua 2. Prevalence Index = B/A =		25	Υ	Fac					
3. Juncus effusus 20 Y FacW 4. Sisyrinchium californicum 20 Y FacW 5					Column Totals:	(A))	(B)	
20 Y FacW Hydrophytic Vegetation Indicators: 5.		20	Υ	FacW	Prevalence Index	= B/A =			
6		20	Υ	FacW	-				
6	5.				Dominance Test is	>50%			
7					Prevalence Index i	s ≤3.0 ¹			
9					Morphological Ada	ptations ¹	(Provide suppo	orting	
9. 10	8							:)	
10	9							oin)	
Moody Vine Stratum (Plot size:)	10				•	. , ,	` .	,	
Woody Vine Stratum (Plot size:) 1	11							must	
1	Woody Vino Stratum (Plot size:	85	_= Tota	al Cover					
2	1 · · · · · · · · · · · · · · · · · · ·				Hydrophytic				
% Bare Ground in Herb Stratum = Total Cover					Vegetation				
% Bare Ground in Herb Stratum					Present? Ye	s_ <u>/</u> _	No		
				- ·					

SOIL									Sampling Point: 9
Profile Desc	cription: (Describ	e to the d	epth ne	eded to docun	nent the ir	ndicator o	or confirm	n the absen	ce of indicators.)
Depth	Matrix				x Features				
(inches)	Color (moist)	%	<u>C</u>	olor (moist)	<u></u> %	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-2	10YR 2/2							Sa lo	Saturated
2-16+	10YR 4/2		_					Lo sa	Saturated
								-	
									- -
								-	
	-								
¹ Type: C=C	oncentration, D=D	epletion. R	M=Redu	uced Matrix. CS	=Covered	or Coate	d Sand G	rains. ² L	
	Indicators: (App								ators for Problematic Hydric Soils ³ :
Histosol	(A1)			Sandy Redox (S	S5)			2	cm Muck (A10)
Histic E	pipedon (A2)			Stripped Matrix	(S6)			R	ed Parent Material (TF2)
Black H	istic (A3)		. L	_oamy Mucky M	lineral (F1) (except	MLRA 1)	0	ther (Explain in Remarks)
	en Sulfide (A4)			_oamy Gleyed I					
-	d Below Dark Surf	ace (A11)		Depleted Matrix				3	
	ark Surface (A12)			Redox Dark Sur	` '	7 \			ators of hydrophytic vegetation and
-	Mucky Mineral (S1) Gleyed Matrix (S4))		Depleted Dark S Redox Depressi		7)			tland hydrology must be present, less disturbed or problematic.
	Layer (if present)	-	. г	Redux Deplessi	10115 (1-0)			I	less disturbed of problematic.
Type:	_u, c. (p. ccc,								
Depth (in								Hydric Se	oil Present? Yes No
Remarks:	<u> </u>							11,41100	<u></u> <u></u>
HYDROLO Wetland Hy	GY drology Indicator	's:							
Primary Indi	cators (minimum o	f one requi	red; che	eck all that apply	/)			Sec	condary Indicators (2 or more required)
Surface	Water (A1)			Water-Stai	ned Leave	es (B9) (e x	xcept MLF	RA	Water-Stained Leaves (B9) (MLRA 1, 2,
High Wa	ater Table (A2)			1, 2, 4A	, and 4B)				4A, and 4B)
✓ Saturati	on (A3)			Salt Crust	(B11)				Drainage Patterns (B10)
Water M	larks (B1)			Aquatic Inv	ertebrates	s (B13)			Dry-Season Water Table (C2)
Sedime	nt Deposits (B2)			Hydrogen	Sulfide Od	or (C1)			Saturation Visible on Aerial Imagery (C9)
Drift De	posits (B3)			Oxidized R	hizospher	es along I	Living Roc	ots (C3)	Geomorphic Position (D2)
Algal Ma	at or Crust (B4)			Presence of	of Reduced	d Iron (C4	.)		Shallow Aquitard (D3)
Iron Dep	posits (B5)			Recent Iro	n Reductio	n in Tilled	d Soils (C6		FAC-Neutral Test (D5)
Surface	Soil Cracks (B6)			Stunted or	Stressed I	Plants (D'	1) (LRR A	.)	Raised Ant Mounds (D6) (LRR A)
Inundati	on Visible on Aeria	al Imagery	(B7)	Other (Exp	lain in Rer	marks)		,	Frost-Heave Hummocks (D7)
Sparsely	y Vegetated Conc	ave Surface	e (B8)						
Field Obser	vations:								
Surface Wat	er Present?	Yes	_ No _	_ Depth (inc	ches):		_		
Water Table	Present?			Depth (inc					
	pillary fringe)			Depth (inc				•	ogy Present? Yes V No No
Describe Re	corded Data (strea	am gauge,	monitori	ng well, aerial p	motos, pre	evious ins	pections),	ıı avallable:	
Remarks:									

Project/Site: Orcas Island Airport		(City/Count	_{ty:} San Juar	n County	_ Sampling Date: 11/8/1	13	
Applicant/Owner: Orcas Island Airport (c/o	WH Pacific, Ir	nc.			State: WA	Sampling Point: 10	Sampling Point: 10	
Investigator(s): A. Bachman & S. Brainard			Section, T	ownship, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drainage						e Slope (%)): 0-5	
						N Datum:		
Soil Map Unit Name: Sholander-Spieden c						cation:		
Are climatic / hydrologic conditions on the sit				_				
Are Vegetation, Soil, or Hydro		-				present? Yes _ V _ N	Nο	
Are Vegetation, Soil, or Hydro					eded, explain any answ		_	
SUMMARY OF FINDINGS – Attac							es, etc.	
Hydrophytic Vegetation Present? Y	res_ 🗸 _ No)	lo 4	the Campled	Aron			
Hydric Soil Present? Y	es_ 🗸 _ No	o		the Sampled thin a Wetlar		No		
	es _ 🗸 No	·		a wetiai	100			
Remarks:								
VEGETATION – Use scientific nar	nes of plant	s.						
Tree Stratum (Plot size:)		Absolute % Cover		nt Indicator Status	Dominance Test wor			
1					Number of Dominant S That Are OBL, FACW,		_ (A)	
2					Total Number of Domin Species Across All Str		_ (B)	
4				cover	Percent of Dominant S That Are OBL, FACW,		_ (A/B)	
Sapling/Shrub Stratum (Plot size: 1					Prevalence Index wo	rksheet:		
2						Multiply by:		
3					OBL species	x 1 =	_	
4					FACW species	x 2 =	_	
5					FAC species	x 3 =	_	
Hart Oracles (Plateins			= Total C	cover		x 4 =		
Herb Stratum (Plot size:) 1. Phalaris arundinacea		90	Υ	FacW		x 5 =		
2. Carex obnupta		5	N	Obl	Column Totals:	(A)	(B)	
3. Poa annua		5	N	Fac	Prevalence Index	x = B/A =		
4.					Hydrophytic Vegetati	on Indicators:		
5					Dominance Test is	s >50%		
6					Prevalence Index	is ≤3.0 ¹		
7					Morphological Ada	aptations ¹ (Provide suppo ks or on a separate sheetj	orting	
8					Wetland Non-Vaso)	
9						ophytic Vegetation ¹ (Expla	ain)	
10					•	oil and wetland hydrology	,	
11		100			be present, unless dist			
Woody Vine Stratum (Plot size:)	100	= Total Co	over				
1	,				Hydrophytic			
2.					Vegetation			
			= Total Co		Present? Ye	es No		
% Bare Ground in Herb Stratum	<u> </u>							
Remarks:								

SOIL							Sampling Point: 10
Profile Description: (Describe	to the depth	needed to do	cument the ir	dicator	or confirm	the absenc	
Depth Matrix		Re	edox Features				
(inches) Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-18 10YR 3/1	1	0YR 4/4	5			Si lo	Saturated
¹ Type: C=Concentration, D=De	pletion, RM=R	educed Matrix	CS=Covered	or Coate	d Sand Gr	ains ² I	ocation: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Appli							tors for Problematic Hydric Soils ³ :
Histosol (A1)		Sandy Redo	x (S5)			2 (cm Muck (A10)
Histic Epipedon (A2)		Stripped Mat				Re	ed Parent Material (TF2)
Black Histic (A3)	•	-	xy Mineral (F1)	(except	MLRA 1)	Ot	her (Explain in Remarks)
Hydrogen Sulfide (A4)			ed Matrix (F2)				
Depleted Below Dark Surfa Thick Dark Surface (A12)	ce (A11)	Depleted Ma Redox Dark	` ,			3Indiaa	tors of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	·		rk Surface (F6)	7)			land hydrology must be present,
Sandy Gleyed Matrix (S4)		Redox Depre	•	,			ess disturbed or problematic.
Restrictive Layer (if present):		· ·	. ,				·
Туре:		_					
Depth (inches):						Hydric So	il Present? Yes No
Remarks:							
HYDROLOGY							
Wetland Hydrology Indicators) :						
Primary Indicators (minimum of	one required; o	check all that a	pply)			Sec	ondary Indicators (2 or more required)
Surface Water (A1)		Water-S	Stained Leave	s (B9) (e x	xcept MLF		Water-Stained Leaves (B9) (MLRA 1, 2,
High Water Table (A2)		1, 2,	4A, and 4B)				4A, and 4B)
✓ Saturation (A3)		Salt Cru	ust (B11)			_	Drainage Patterns (B10)
Water Marks (B1)		Aquatic	Invertebrates	(B13)			Dry-Season Water Table (C2)
Sediment Deposits (B2)		Hydrog	en Sulfide Od	or (C1)			Saturation Visible on Aerial Imagery (C9)
Drift Deposits (B3)			•	-	•	. ,	Geomorphic Position (D2)
Algal Mat or Crust (B4)			ce of Reduced	`	,		Shallow Aquitard (D3)
Iron Deposits (B5)			Iron Reductio				FAC-Neutral Test (D5)
Surface Soil Cracks (B6)			d or Stressed I	`	1) (LRR A)	•	Raised Ant Mounds (D6) (LRR A)
Inundation Visible on Aerial		,	Explain in Rer	narks)		•	Frost-Heave Hummocks (D7)
Sparsely Vegetated Concar	ve Surface (B8)			1		
Field Observations:	V	.	(:)				
	Yes No						
	Yes No						
Saturation Present? (includes capillary fringe) Describe Recorded Data (streat	Yes No					-	gy Present? Yes 🗸 No

Remarks:

Project/Site: Orcas Island Airport		(/County: San Juan County Sampling Date: 11/				3	
Applicant/Owner: Orcas Island Airport	t (c/o WH Pacific	c, Inc.			State: WA	_ Sampling P	oint: 11	
Investigator(s): A. Bachman & S. Brai	inard	;	Section	n, Township, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drai	nageways		Local	relief (concave,	convex, none): Concav	е	_ Slope (%):	0-5
		Lat: 48°4	Lat: 48°42'17.96"N Long: 122°54'33.06"W Datum:					
Soil Map Unit Name: Sholander-Spied					NWI classif			
Are climatic / hydrologic conditions on the	he site typical for	this time of yea	ar? Ye					
Are Vegetation, Soil, or		•			"Normal Circumstances"		es 🗸 No	0
Are Vegetation, Soil, or					eeded, explain any answ			
SUMMARY OF FINDINGS – A								s, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸	No		l- (l- 0l- l				
Hydric Soil Present?	Yes	No 🗸		Is the Sampled within a Wetlar		No	/	
Wetland Hydrology Present?	Yes	No _ 🗸		within a wetian	iur res	NO	<u> </u>	
Remarks:								
VEGETATION – Use scientific	names of pla				1			
Tree Stratum (Plot size:)	Absolute % Cover		nant Indicator ies? Status	Dominance Test wor			
1	,				Number of Dominant S That Are OBL, FACW			(A)
2					Total Number of Domi			
3					Species Across All Str	ata: 1		(B)
4				al Cover	Percent of Dominant S That Are OBL, FACW		00	(A/B)
Sapling/Shrub Stratum (Plot size:					Prevalence Index wo	rksheet:		
2.					Total % Cover of:		fultiply by:	
3					OBL species			
4.					FACW species	x 2 =	·	_
5.					FAC species	x 3 =		_
		-			FACU species	x 4 =	·	_
Herb Stratum (Plot size:)	00	V	Гоо	UPL species	x 5 =		_
1. Poa pratensis			N	Fac FacU	Column Totals:	(A)		_ (B)
2. Dactylis glomerata 3. Agrostis tenuis		5	N	Faco Faco	Prevalence Inde	v - B/A -		
					Hydrophytic Vegetat			
4. 5.					✓ Dominance Test i		.	
6					Prevalence Index			
7					Morphological Ad			ting
8.					data in Remar		arate sheet)	
9.					Wetland Non-Vas		4	
10.					Problematic Hydr		, ,	•
11.					¹ Indicators of hydric so be present, unless dis			nust
		100	= Tota	l Cover	bo procont, amood alo			
Woody Vine Stratum (Plot size:	ŕ							
1					Hydrophytic Vegetation			
2						es/_ N	No	
% Bare Ground in Herb Stratum			= Tota	l Cover				
Remarks:					1			

SOIL			Sampling Point: 11
Profile Description: (Describe to the de	oth needed to document the indicator or confi	rm the absence	of indicators.)
Depth Matrix	Redox Features		
(inches) Color (moist) %	Color (moist) % Type ¹ Loc ²	Texture	Remarks
0-18 fill		gravelly sand	Slightly Moist
			-
		<u> </u>	
71	=Reduced Matrix, CS=Covered or Coated Sand		cation: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to al	I LRRs, unless otherwise noted.)	Indicato	ors for Problematic Hydric Soils ³ :
Histosol (A1)	Sandy Redox (S5)		n Muck (A10)
Histic Epipedon (A2)	Stripped Matrix (S6)		Parent Material (TF2)
Black Histic (A3)	Loamy Cloved Metrix (F3)	1) Oth	er (Explain in Remarks)
Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2) Depleted Matrix (F3)		
Thick Dark Surface (A12)	Redox Dark Surface (F6)	3Indicate	ors of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Depleted Dark Surface (F7)		and hydrology must be present,
Sandy Gleyed Matrix (S4)	Redox Depressions (F8)		s disturbed or problematic.
Restrictive Layer (if present):			
Type:			
Depth (inches):		Hydric Soil	Present? Yes No
Remarks:		L	
HYDROLOGY			
Wetland Hydrology Indicators:	deskeed all that analy	0	a dans la l'actore (O an accordance l'act)
Primary Indicators (minimum of one require			ndary Indicators (2 or more required)
Surface Water (A1)	Water-Stained Leaves (B9) (except N	ILRA V	Vater-Stained Leaves (B9) (MLRA 1, 2,
High Water Table (A2) ✓ Saturation (A3)	1, 2, 4A, and 4B)	_	4A, and 4B)
Catalation (AG)	Salt Crust (B11)		Prainage Patterns (B10)
Water Marks (B1)	Aquatic Invertebrates (B13)		ry-Season Water Table (C2)
Sediment Deposits (B2)	Hydrogen Sulfide Odor (C1)	· · · · · · · · · · · · · · · · · · ·	aturation Visible on Aerial Imagery (C9)
Drift Deposits (B3)	Oxidized Rhizospheres along Living R Presence of Reduced Iron (C4)	, ,	• • • • • • • • • • • • • • • • • • • •
Algal Mat or Crust (B4)	,		hallow Aquitard (D3)
Iron Deposits (B5)	Recent Iron Reduction in Tilled Soils (Stunted or Stressed Plants (D1) (LRR		AC-Neutral Test (D5)
Surface Soil Cracks (B6)	` , `	,	rost Haava Hummasks (D7)
Inundation Visible on Aerial Imagery (ESparsely Vegetated Concave Surface		, г	rost-Heave Hummocks (D7)
Field Observations:	(50)		
	No V Depth (inches):		
	No _ V _ Depth (inches):		
	No Depth (inches):		Para
(includes capillary fringe)	No _ ✓ _ Depth (inches): Woonitoring well, aerial photos, previous inspections	, ,	y Present? Yes No

Remarks:

Project/Site: Orcas Island Airport		(ounty: San Juan County Sampling Date: 1				3/13		
Applicant/Owner: Orcas Island Airport	(c/o WH Pacific,	Inc.			State: WA	_ Sampline	Sampling Point: 12		
Investigator(s): A. Bachman & S. Brai	nard	;	Section,	Township, Ra	nge: S11, T37N, R2W				
Landform (hillslope, terrace, etc.): Drain	nageways		Local re	elief (concave,	convex, none): Concav	е	Slope (%): <u>0-5</u>	
		Lat: 48°4	42'17.9	6"N	Long: <u>122°54'33.06"W</u> Datum:				
Soil Map Unit Name: Sholander-Spied					NWI classifi				
Are climatic / hydrologic conditions on the	ne site typical for th	nis time of yea							
Are Vegetation, Soil, or	Hydrology	significantly	disturbe	d? Are "	Normal Circumstances"	present?	Yes _ 🗸 _	No	
Are Vegetation, Soil, or					eded, explain any answ	ers in Rem	ıarks.)		
SUMMARY OF FINDINGS - A	ttach site map	showing	samp	ling point l	ocations, transect	s, impor	tant featu	ıres, etc.	
Hydrophytic Vegetation Present?	Yes _ 🗸	No		- 41 - 0 1 - 1					
Hydric Soil Present?	Yes _ 🗸	No		s the Sampled vithin a Wetlar		No			
Wetland Hydrology Present?	Yes _ 🗸 _	No	•	vitilii a vvetiai	iu: 165	140			
Remarks:									
VEGETATION – Use scientific	names of pla								
Tree Stratum (Plot size:	1	Absolute % Cover		ant Indicator	Dominance Test wor				
1	,				Number of Dominant S That Are OBL, FACW,		2	(A)	
2					Total Number of Domi		0		
3					Species Across All Str	ata:	2	(B)	
4				Cover	Percent of Dominant S That Are OBL, FACW,		100	(A/B)	
1					Prevalence Index wo	rksheet:			
2.					Total % Cover of:		Multiply by:	<u>:</u>	
3.					OBL species				
4					FACW species	x 2	2 =		
5					FAC species	x:	3 =		
			= Total	Cover	FACU species				
Herb Stratum (Plot size:)	70	Y	Fac	UPL species				
2. Oenanthe sarmentosa		- 70 20	Y	Obl	Column Totals:	(A))	(B)	
3. Juncus effusus		10	N	FacW	Prevalence Inde	x = B/A =			
4					Hydrophytic Vegetat				
5					Dominance Test is	s >50%			
6.					Prevalence Index	is ≤3.0 ¹			
7					Morphological Ada	aptations1 ((Provide sup	porting	
8					data in Remark Wetland Non-Vas			et)	
9					Problematic Hydro			nloin)	
10					¹ Indicators of hydric so		• .	• •	
11					be present, unless dis			gy must	
Woody Vine Stratum (Plot size:	`	100	= Total	Cover					
1	•				Hydrophytic				
2.					Vegetation				
			= Total		Present? Yo	es _ 🗸 _	No	_	
% Bare Ground in Herb Stratum				: - :					
Remarks:									
İ									

SOIL	Sampling Point: 12
	. • -
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of in	dicators.)

Depth	Matrix	•	Redo	x Feature	s			•
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-18	10YR 2/2		0YR 3/4	5			silt loam	Saturated
				-				
							-	
				-				
				-				
	oncentration, D=Depl					ed Sand Gr		cation: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Application	ible to all LF	RRs, unless other	wise not	ed.)		Indicato	ors for Problematic Hydric Soils ³ :
Histosol	(A1)	٠	Sandy Redox (S	S5)			2 cm	n Muck (A10)
	oipedon (A2)		Stripped Matrix					Parent Material (TF2)
	istic (A3)		Loamy Mucky N			MLRA 1)	Oth	er (Explain in Remarks)
	en Sulfide (A4)	•	Loamy Gleyed I	•	()			
	d Below Dark Surface	(A11)	Depleted Matrix				2	
	ark Surface (A12)	•	Redox Dark Sur	` '				ors of hydrophytic vegetation and
-	Mucky Mineral (S1)	٠	Depleted Dark S	,	7)			and hydrology must be present,
	Gleyed Matrix (S4)	r	Redox Depress	ions (F8)			unles	s disturbed or problematic.
Restrictive	Layer (if present):							
Type:			<u> </u>					_
Depth (in	ches):						Hydric Soil	Present? Yes No
Remarks:								
IVDDOL O	0 1/							
HYDROLO	GY							
Wetland Hy	drology Indicators:							
Primary Indi	cators (minimum of o	ne required;	check all that apply	/)			Secor	ndary Indicators (2 or more required)
Surface	Water (A1)		Water-Stai	ned Leav	es (B9) (e	xcept MLF	RA W	Vater-Stained Leaves (B9) (MLRA 1, 2,
	ater Table (A2)		· · · · · · · · · · · · · · · · · · ·	, and 4B	. , .	•		4A, and 4B)
✓ Saturati			Salt Crust		,		D	prainage Patterns (B10)
	larks (B1)			` '	c (P12)			ry-Season Water Table (C2)
·	` ,		Aquatic Inv		` '			• , ,
	nt Deposits (B2)		Hydrogen		, ,	=		aturation Visible on Aerial Imagery (C9)
	posits (B3)		Oxidized R		_	_		Geomorphic Position (D2)
Algal Ma	at or Crust (B4)		Presence of	of Reduce	ed Iron (C	4)	S	hallow Aquitard (D3)
Iron Dep	oosits (B5)		Recent Iro	n Reducti	on in Tille	d Soils (C6	6) F	AC-Neutral Test (D5)
Surface	Soil Cracks (B6)		Stunted or	Stressed	Plants (D	1) (LRR A) R	aised Ant Mounds (D6) (LRR A)
Inundati	on Visible on Aerial I	magery (B7)	Other (Exp	lain in Re	marks)		F	rost-Heave Hummocks (D7)
	y Vegetated Concave)					, ,
Field Obser		,	•					
Surface Wat		s No	Depth (inc	hes).				
Water Table			Depth (inc					
Saturation P		es <u> </u>	Depth (inc	thes): <u>U</u>		Wetla	and Hydrolog	y Present? Yes <u>'</u> No
	oillary fringe) corded Data (stream	gauge, moni	toring well, aerial r	photos, pr	evious ins	pections).	if available:	
Doddilborto	oordod Bata (otrodin	gaago, mom	toring won, donar p	лосоо, р	ovious inc	poonono,,	ii availabio.	
<u> </u>								
Remarks:								

Project/Site: Orcas Island Airport		(_{ounty:} San Juai	ate: 11/8/13			
Applicant/Owner: Orcas Island Airpor	rt (c/o WH Pacific	c, Inc.			State: WA	_ Sampling Po	_{int:} 13
Investigator(s): A. Bachman & S. Bra	inard	;	Section	n, Township, Ra	nge: S11, T37N, R2W		
Landform (hillslope, terrace, etc.): Dra	inageways		Local	relief (concave,	convex, none): Concav	е	Slope (%): <u>0-5</u>
Subregion (LRR): LRR-A		Lat: 48°4	42'17.	96"N	Long: 122°54'33.06"W Datum:		
Soil Map Unit Name: Sholander-Spie	den complex, 0 t	o 5 percent sl	opes		NWI classif	ication:	
Are climatic / hydrologic conditions on	the site typical for	this time of year	ar? Ye				
Are Vegetation, Soil, or	Hydrology _	_ significantly	disturb	ped? Are	"Normal Circumstances"	present? Yes	;_ 🗸 _ No _
Are Vegetation, Soil, or	Hydrology	_ naturally pro	blema	tic? (If ne	eeded, explain any answ	ers in Remarks	s.)
SUMMARY OF FINDINGS - A	ttach site ma	p showing	sam	pling point l	ocations, transect	s, importan	t features, etc.
Hydrophytic Vegetation Present?	Yes	No _ 🗸		Is the Sampled	I Area		
Hydric Soil Present?	Yes	No _ 🗸 _		within a Wetlar		No_ •	,
Wetland Hydrology Present?	Yes	No					_ _
Remarks:							
VEGETATION – Use scientific	names of pla	ants.					
		Absolute		inant Indicator	Dominance Test wor	ksheet:	
Tree Stratum (Plot size:1	,			cies? Status	Number of Dominant S That Are OBL, FACW	Species , or FAC: 1	(A)
2					Total Number of Dom Species Across All Str		(B)
4				al Cover	Percent of Dominant S That Are OBL, FACW		0 (A/B)
Sapling/Shrub Stratum (Plot size:					Prevalence Index wo		
1 2					Total % Cover of:		ıltinly by:
3					OBL species		
4.					FACW species		
5.					FAC species	x 3 =	
					FACU species	x 4 =	
Herb Stratum (Plot size:)	70	V	Гоо	UPL species	x 5 = _	
1. Poa annua 2. Trifolium pratense		<u>70</u>	<u>Y</u>	Fac FacU	Column Totals:	(A) _	(B)
Taraxacum officinale			N	FacU	Prevalence Inde	x = B/A =	
4					Hydrophytic Vegetat		
5					Dominance Test i		
6					Prevalence Index	is ≤3.0 ¹	
7					Morphological Ad data in Remar	aptations ¹ (Provks or on a sepa	vide supporting arate sheet)
8					Wetland Non-Vas		,
9					Problematic Hydr	ophytic Vegetat	tion¹ (Explain)
10					¹ Indicators of hydric s		
· · ·		400	- Tota	al Cover	be present, unless dis	turbed or proble	ematic.
Woody Vine Stratum (Plot size:)		1016	00001			
1					Hydrophytic		
2					Vegetation Present? Y	es No	。 <i>∨</i>
% Bare Ground in Harb Stratum			= Tota	al Cover		·	
% Bare Ground in Herb Stratum Remarks:					1		

SOIL								Sampling Point: 13
Profile Desc	cription: (Describe	to the dep	th needed to docum	ent the	indicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	Feature	s			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
	:							•

Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Redox Deprese Restrictive Layer (if present): Type: Depth (inches): Primary Indicators (minimum of one required; check all that ap Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Depleted Matrix Depoleted Dark Redox Deprese Redox Deprese Depted One Predox Depted Redox Deprese Depted One Predox	CS=Covered or Cerwise noted.) (S5) ix (S6) ix (S6) ix (Mineral (F1) (ex d) Matrix (F2) rix (F3) ix (F3) ix (F3) ix (F4) ix (F6) ix (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr	PL=Pore Lining, M=Matrix. Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, Chydric Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Sandy Redox Stripped Matrix (A3) Loamy Mucky Hydrogen Sulfide (A4) Loamy Gleyed Depleted Below Dark Surface (A11) Depleted Matrix (A12) Redox Dark Sandy Mucky Mineral (S1) Depleted Dark Sandy Gleyed Matrix (S4) Redox Deprestrictive Layer (if present): Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that ap Surface Water (A1) Water-St 1, 2, 4 Saturation (A3) Salt Crus Saturation (A3) Salt Crus Water Marks (B1) Aquatic Matrix (B2) Mydroge Drift Deposits (B3) Oxidized	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	ns. ² Location: I Indicators for F 2 cm Muck Red Parent Other (Explain) 3Indicators of hy wetland hydr unless disturb	PL=Pore Lining, M=Matrix. Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Nydric Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Histosol (A2) Stripped Matri Black Histic (A3) Loamy Mucky Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Redox Depress Restrictive Layer (if present): Type: Depth (inches): Remarks: Primary Indicators (minimum of one required; check all that applications (Material) High Water Table (A2) Saturation (A3) Satl Crus Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Stripped Matrix Stripped Matrix Loamy Redox Depleted Matrix Redox Depress Redox Dep	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
ydric Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Sandy Redox Histic Epipedon (A2) Stripped Matri Black Histic (A3) Loamy Mucky Hydrogen Sulfide (A4) Loamy Gleyed Depleted Below Dark Surface (A11) Depleted Matri Thick Dark Surface (A12) Redox Dark Sindy Gleyed Matrix (S4) Redox Depress estrictive Layer (if present): Type: Depth (inches): emarks: TOROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; check all that application of the company of the	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
ydric Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Histosol (A2) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Redox Deprese Setrictive Layer (if present): Type: Depth (inches): Depth (inches): Demarks: Timary Indicators (minimum of one required; check all that applications (Material) High Water Table (A2) Saturation (A3) Salt Crus Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Stripped Matrix Sandy Redox Stripped Matrix Redox Deprese (A11) Depleted Dark Redox Deprese (A12) Redox Deprese (A13) Redox Deprese (A13) Depleted Dark Redox Deprese (A14)	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
rdric Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Histosol (A2) Histic Epipedon (A2) Black Histic (A3) Loamy Mucky Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Redox Deprese Setrictive Layer (if present): Type: Depth (inches): Depth (inches): Smarks: DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one required; check all that applications (A3) High Water Table (A2) Saturation (A3) Salt Crus Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Stripped Matrix Stripped Matrix Redox Deprese (A11) Depleted Dark Redox Deprese (A12) Redox Deprese (A13) Redox Deprese (A13) Redox Deprese (A14) Redox Deprese (A44) Redox Deprese (erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Advantage of the control of the cont	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
rdric Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Histosol (A2) Histic Epipedon (A2) Black Histic (A3) Loamy Mucky Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Redox Deprese Setrictive Layer (if present): Type: Depth (inches): Depth (inches): Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Stripped Matrix Stripped Matrix Stripped Matrix Hoamy Indicators: Indicators (minimum of one required; check all that applications) Aquatic I Sediment Deposits (B3) Sandy Redox Stripped Matrix Stripped Matrix Redox Dark S Redox Deprese Matrix Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Dark S Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Deprese Redox Dark S Redox Deprese Redox Deprese Redox Dark S Redox Deprese Redox Dark S Redox Deprese Redox Dark S Redox	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
rdric Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Histosol (A2) Histic Epipedon (A2) Black Histic (A3) Loamy Mucky Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Redox Deprese Setrictive Layer (if present): Type: Depth (inches): Depth (inches): Smarks: DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one required; check all that applications (A3) High Water Table (A2) Saturation (A3) Salt Crus Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Stripped Matrix Stripped Matrix Redox Deprese (A11) Depleted Dark Redox Deprese (A12) Redox Deprese (A13) Redox Deprese (A13) Redox Deprese (A14) Redox Deprese (A44) Redox Deprese (erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Advantage of the control of the cont	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Advantage of the control of the cont	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Advice Soil Indicators: (Applicable to all LRRs, unless oth Histosol (A1) Histosol (A2) Histic Epipedon (A2) Black Histic (A3) Loamy Mucky Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Redox Deprese Setrictive Layer (if present): Type: Depth (inches): Depth (inches): Demarks: DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required; check all that application (A3) High Water Table (A2) Saturation (A3) Salt Crust Sandy Redox Sandy Mucky Mineral (S1) Sediment Deposits (B2) Drift Deposits (B3) Sandy Redox Stripped Matrix Redox Deprese Redox Depre	erwise noted.) (S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) surface (F6) c Surface (F7)	cept MLRA 1)	Indicators for F 2 cm Muck Red Parent Other (Explain) Indicators of hy wetland hydr unless disturb	Problematic Hydric Soils ³ : (A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Petractive Layer (if present): Type: Depth (inches):	(S5) ix (S6) Mineral (F1) (ex Matrix (F2) rix (F3) iurface (F6) c Surface (F7)		2 cm Muck Red Parent Other (Explain 3Indicators of hy wetland hydrunless disturb	(A10) Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.
Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Petrictive Layer (if present): Type: Depth (inches): ix (S6) Mineral (F1) (ex Matrix (F2) Mix (F3) Mix (F6) Mix (F6) Mix Surface (F7)		Red Parent Other (Explain Indicators of hy wetland hydr unless disturb	Material (TF2) ain in Remarks) drophytic vegetation and ology must be present, bed or problematic.	
Black Histic (A3) Loamy Mucky Hydrogen Sulfide (A4) Loamy Gleyer Depleted Below Dark Surface (A11) Depleted Matin Thick Dark Surface (A12) Redox Dark Signary Mucky Mineral (S1) Depleted Dark Sandy Gleyed Matrix (S4) Redox Depres Estrictive Layer (if present): Type: Depth (inches): Dept	Mineral (F1) (ex d Matrix (F2) rix (F3) surface (F6) c Surface (F7)		Other (Explain of the other of the other of the other of the other of the other of the other other of the other other of the other of the other	drophytic vegetation and ology must be present, bed or problematic.
Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Petrictive Layer (if present): Type: Depth (inches): Permarks: DROLOGY Petland Hydrology Indicators: Imary Indicators (minimum of one required; check all that applications (Material) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Depleted Matrix (A11) Depleted Dark Redox Depresed on Properties Redox Dark Sediox Depleted Dark Redox Depresed on Properties Redox Dark Sediox Depleted Dark Sediox Depleted Dark Sediox Depresed on Properties Redox Dark Sediox Depleted Dark Sediox	d Matrix (F2) rix (F3) surface (F6) c Surface (F7)		³ Indicators of hy wetland hydr unless disturi	drophytic vegetation and ology must be present, bed or problematic.
Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Petrictive Layer (if present): Type: Depth (inches): Depth (inche	rix (F3) surface (F6) x Surface (F7)		wetland hydr unless disturl	ology must be present, bed or problematic.
Thick Dark Surface (A12) Redox Dark S Sandy Mucky Mineral (S1) Depleted Dark Sandy Gleyed Matrix (S4) Redox Depresents: Type:	Surface (F6)		wetland hydr unless disturl	ology must be present, bed or problematic.
Sandy Mucky Mineral (S1) Depleted Dark Sandy Gleyed Matrix (S4) Redox Depresents: Type:	Surface (F7)		wetland hydr unless disturl	ology must be present, bed or problematic.
Sandy Gleyed Matrix (S4) Redox Depress setrictive Layer (if present): Type: Depth (inches): emarks: DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required; check all that apples and the set of the s			unless disturl	bed or problematic.
pestrictive Layer (if present): Type: Depth (inches): pemarks: DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required; check all that apple of the second of	9310113 (1-0)			
Depth (inches):			Hydric Soil Presen	nt? Yes No_
Depth (inches):			Hydric Soil Presen	nt? Yes No <u>V</u>
PROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required; check all that ap Surface Water (A1) Water-St High Water Table (A2) 1, 2, 4 Saturation (A3) Salt Crus Water Marks (B1) Aquatic I Sediment Deposits (B2) Hydroge Drift Deposits (B3) Oxidized			nyaric Soli Presen	no
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required; check all that ap _ Surface Water (A1) Water-St _ High Water Table (A2) 1, 2, 4 Saturation (A3) Salt Crus _ Water Marks (B1) Aquatic I _ Sediment Deposits (B2) Hydroge _ Drift Deposits (B3) Oxidized				
imary Indicators (minimum of one required; check all that apple Surface Water (A1) Water-Start High Water Table (A2) Saturation (A3) Water Marks (B1) Aquatic I Sediment Deposits (B2) Hydroge Drift Deposits (B3) Oxidized				
Surface Water (A1) Water-St High Water Table (A2) 1, 2, 4 Saturation (A3) Salt Crus Water Marks (B1) Aquatic I Sediment Deposits (B2) Hydroge Drift Deposits (B3) Oxidized				
Surface Water (A1) Water-St High Water Table (A2) 1, 2, 4 Saturation (A3) Salt Crus Water Marks (B1) Aquatic I Sediment Deposits (B2) Hydroge Drift Deposits (B3) Oxidized	olv)		Secondary In	dicators (2 or more required)
High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) 1, 2, 4 Aquatic I Hydroge Oxidized		9) (except MLRA		ained Leaves (B9) (MLRA 1, 2
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Salt Crus Aquatic I Hydroge Oxidized	4A, and 4B)	o) (except MEIXA	·	nd 4B)
_ Water Marks (B1) Aquatic I _ Sediment Deposits (B2) Hydroge _ Drift Deposits (B3) Oxidized			•	Patterns (B10)
Sediment Deposits (B2) Hydroge Drift Deposits (B3) Oxidized	nvertebrates (B1	3)		on Water Table (C2)
Drift Deposits (B3) Oxidized	n Sulfide Odor (C			n Visible on Aerial Imagery (C9
	•	long Living Roots		whic Position (D2)
	e of Reduced Iron	0 0	· / ·	Aquitard (D3)
· ,	ron Reduction in	` '		itral Test (D5)
	or Stressed Plant	, ,		nt Mounds (D6) (LRR A)
` '	xplain in Remark			ave Hummocks (D7)
Sparsely Vegetated Concave Surface (B8)	vpiairi iri remark	3)	11031110	ave Hammooks (D1)
eld Observations:				
	noboo):			
ırface Water Present? Yes No Depth (i	, -			
ater Table Present? Yes No Depth (i				
aturation Present? Yes No Depth (i	nches):	Wetlan	d Hydrology Prese	nt? Yes No
ncludes capillary fringe) escribe Recorded Data (stream gauge, monitoring well, aeria			available:	
	I photos, previous	s inspections), if		
omarke:	l photos, previou	s inspections), if		
emarks:	l photos, previou	s inspections), if		
	l photos, previou	s inspections), if		

Project/Site: Orcas Island Airport		(City/Co	ounty: Sar	n Juan	County	Samplin	g Date: 11	/8/13
Applicant/Owner: Orcas Island Airpor	t (c/o WH Pacific	, Inc.				State: WA	Samplin	g Point: 14	1
Investigator(s): A. Bachman & S. Bra	inard		Sectio	n, Townshi	ip, Rar	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drai	nageways		Local	relief (cond	cave, c	convex, none): Concave)	Slope	e (%): <u>0-5</u>
		Lat: 48°4	42'17.	96"N		Long: 122°54'33.06"V	V	Datum:	:
Soil Map Unit Name: Sholander-Spied						NWI classific			
Are climatic / hydrologic conditions on t	he site typical for t	his time of yea	ar? Ye						
Are Vegetation, Soil, or		-				Normal Circumstances"			No
Are Vegetation, Soil, or						eded, explain any answe			
SUMMARY OF FINDINGS – A									tures, etc.
Hydrophytic Vegetation Present?	Yes	No 🗸		la tha Car		A			
Hydric Soil Present?	Yes	No _ 🖊 _		Is the Sar within a V	-		No	~	
Wetland Hydrology Present? Remarks:	Yes	No		within a v	venan	u. 105			
VEGETATION – Use scientific	names of pla	ınts.							
	<u> </u>	Absolute	Dom	inant Indic	ator	Dominance Test work	sheet:		
Tree Stratum (Plot size:		% Cover				Number of Dominant S That Are OBL, FACW,		1	(A)
2 3						Total Number of Domir Species Across All Stra		1	(B)
4 (Plot size:				al Cover		Percent of Dominant S That Are OBL, FACW,		100	(A/B)
1.						Prevalence Index wor	ksheet:		
2.						Total % Cover of:		Multiply b	oy:
3.						OBL species	x	1 =	
4						FACW species	x	2 =	
5						FAC species	x	3 =	
	,		= Tot	al Cover		FACU species			
Herb Stratum (Plot size:)	80	V	Fac		UPL species			
2. Trifolium pratense		5	N	Fac		Column Totals:	(A)	(B)
3. Holcus lanatus		5	N	Fac		Prevalence Index	s = B/A =		
4			-			Hydrophytic Vegetation			
5						Dominance Test is	>50%		
6.						Prevalence Index i	is ≤3.0 ¹		
7						Morphological Ada			
8						data in Remark Wetland Non-Vaso			neet)
9						Problematic Hydro			Evalaia)
10						¹ Indicators of hydric so		•	
11	_					be present, unless dist			
Woody Vine Stratum / Dlot eige	`	90	= Tota	al Cover					
Woody Vine Stratum (Plot size:	•					Hydrophytic			
1 2						Vegetation			
				al Cover		Present? Ye	s_ <u>/</u> _	No	
% Bare Ground in Herb Stratum			. 516						
Remarks:									

SOIL	Sampling Point: 14
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indic	ators.)

Depth	iption: (Descri Matrix		ptn need		x Features		or confirm	the absence	or indicators.)
(inches)	Color (moist)		Col	or (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-8	10YR 3/2							Fine Sa Lo	Moist
8-18	10YR 4/3							Fine Sa Lo	Moist
			· -						
			· ·						
			<u> </u>						
- ' '	ncentration, D=D						d Sand Gr		cation: PL=Pore Lining, M=Matrix.
-	ndicators: (App	ilicable to a				ea.)			ors for Problematic Hydric Soils ³ :
Histosol (ipedon (A2)			indy Redox (S ripped Matrix				· <u></u> -	n Muck (A10) I Parent Material (TF2)
Black His				amy Mucky N	` ') (except	MLRA 1)		er (Explain in Remarks)
	n Sulfide (A4)			amy Gleyed			,		,
Depleted	Below Dark Surf	face (A11)	De	pleted Matrix	(F3)				
	rk Surface (A12)			dox Dark Su	, ,	_,			ors of hydrophytic vegetation and
	ucky Mineral (S1			pleted Dark	•	7)			and hydrology must be present,
	eyed Matrix (S4) ayer (if present)		Re	dox Depress	10115 (F6)			unies	ss disturbed or problematic.
Type:	ayer (ii present)	,-							
,	hes):							Hydric Soil	Present? Yes No
Remarks:								,	
1									
HYDROLOG	2V								
	rology Indicato	re:							
-	ators (minimum o		ed: checl	call that appl	v)			Secor	ndary Indicators (2 or more required)
	Vater (A1)	•		Water-Sta		es (B9) (e)	cept MLF		Vater-Stained Leaves (B9) (MLRA 1, 2,
	er Table (A2)		_	 '	, and 4B)				4A, and 4B)
Saturatio				Salt Crust				D	Prainage Patterns (B10)
Water Ma	arks (B1)			Aquatic In	ertebrates	s (B13)			Pry-Season Water Table (C2)
Sediment	t Deposits (B2)		_	_ Hydrogen	Sulfide Od	or (C1)		s	saturation Visible on Aerial Imagery (C9)
Drift Dep	osits (B3)			Oxidized F	Rhizospher	es along I	_iving Roo	ots (C3) G	Seomorphic Position (D2)
Algal Mat	or Crust (B4)			Presence		,	,		hallow Aquitard (D3)
Iron Depo	` ,		_	_ Recent Iro			,	,	AC-Neutral Test (D5)
	Soil Cracks (B6)		\	Stunted or			I) (LRR A)		taised Ant Mounds (D6) (LRR A)
	n Visible on Aeri			_ Other (Exp	olain in Rei	marks)		, F	rost-Heave Hummocks (D7)
Field Observ	Vegetated Conc	ave Surface	(D0)						
Surface Wate		Vec	No	_ Depth (inc	chec).				
Water Table F				_ Depth (inc					
Saturation Pre				Depth (inc Depth (inc	,			and Hydrolog	y Present? Yes No
(includes capi	illary fringe)								y Fresent: TesNO
Describe Rec	orded Data (stre	am gauge, n	nonitoring	well, aerial p	ohotos, pre	evious insp	oections),	if available:	
Remarks:									

Project/Site: Orcas Island Airport	(City/Co	_{unty:} San Juar	n County	Samplin	g Date: 11/8/1	3
Applicant/Owner: Orcas Island Airport (c/o WH Pacific, I				State: WA	Samplin	g Point: 15	
Investigator(s): A. Bachman & S. Brainard		Section	, Township, Rai	nge: S11, T37N, R2W			
				convex, none): Concave		Slope (%)	. 0-5
Subregion (LRR): LRR-A							
Soil Map Unit Name: Sholander-Spieden complex, 0 to 5				NWI classific			
Are climatic / hydrologic conditions on the site typical for this							
Are Vegetation, Soil, or Hydrology s	-			Normal Circumstances"			lo
Are Vegetation, Soil, or Hydrology n				eded, explain any answe			
SUMMARY OF FINDINGS – Attach site map							es, etc.
Hydrophytic Vegetation Present? Yes _ ✓ _ N	0						
Hydric Soil Present? Yes _ V _ N			s the Sampled				
Wetland Hydrology Present? Yes V N	0	'	within a Wetlan	nd? Yes_ <u>✓</u>	NO		
Remarks:							
VEGETATION – Use scientific names of plan	ts.						
Tree Stratum (Plot size:)	Absolute		nant Indicator	Dominance Test work	sheet:		
1				Number of Dominant S That Are OBL, FACW,		2	(A)
2				Total Number of Domir	nant		
3				Species Across All Stra	ıta:	2	(B)
4	- <u> </u>		l Cover	Percent of Dominant S That Are OBL, FACW,		100	(A/B)
Sapling/Shrub Stratum (Plot size:) 1				Prevalence Index wor	ksheet		
2				Total % Cover of:		Multiply by:	
3.				OBL species			
4.				FACW species	x	2 =	_
5				FAC species	x	3 =	
	-			FACU species	x	4 =	_
Herb Stratum (Plot size:)	25	V	Foo!//	UPL species	x	5 =	
1. Juncus ensifolius 2. Juncus effusus	20	Y	FacW FacW	Column Totals:	(A	.)	(B)
3. Carex obnupta	15	N	Obl	Prevalence Index	, _ Β/Δ _		
4 Holcus lanatus	10	N	Fac	Hydrophytic Vegetation			
5. Sisyrinchium californicum	5	N	FacW	Dominance Test is			
6 Poa annua	5	N	Fac	Prevalence Index i			
7.				Morphological Ada	ptations ¹	(Provide suppo	rting
8				data in Remark)
9.				Wetland Non-Vaso			
10				Problematic Hydro		•	•
11				¹ Indicators of hydric so be present, unless dist			must
	90	= Total	Cover	bo procent, unless dist		Toblomano.	
Woody Vine Stratum (Plot size:)							
1				Hydrophytic Vegetation			
2					s	No	
% Bare Ground in Herb Stratum		_= Total	Cover				
Remarks:				I			

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix			ox Features				
(inches)	Color (moist)	<u>%</u>	Color (moist)		Type ¹	Loc ²	Texture	Remarks
0-18	2.5Y 4/2		10YR 4/6	5			Sa lo	Moist
			_					
	-							
-								-
	oncentration, D=Dep					d Sand G		cation: PL=Pore Lining, M=Matrix.
-	Indicators: (Application	able to all	LRRs, unless othe	rwise noted	d.)			ors for Problematic Hydric Soils ³ :
Histosol			Sandy Redox (•				m Muck (A10)
-	pipedon (A2)		Stripped Matrix		, .			Parent Material (TF2)
	istic (A3)		Loamy Mucky N	, ,	(except	MLRA 1)	Oth	er (Explain in Remarks)
	en Sulfide (A4) d Below Dark Surface	o (A11)	Loamy Gleyed ✓ Depleted Matrix					
	ark Surface (A12)	e (ATT)	Redox Dark Su				3Indicate	ors of hydrophytic vegetation and
	Mucky Mineral (S1)		Depleted Dark	` ')			and hydrology must be present,
-	Gleyed Matrix (S4)		Redox Depress		,			es disturbed or problematic.
	Layer (if present):			(- /			1	
Type:	, , ,							
Depth (in	ches):						Hydric Soil	Present? Yes V No
Remarks:							1.,4	
Remarks.								
HYDROLO	GY							
-	drology Indicators:	ne require	d: check all that appl	lv)			Seco	ndary Indicators (2 or more required)
Wetland Hyd Primary India	drology Indicators: cators (minimum of o	ne require			: (B0) (a)	vcent MI		ndary Indicators (2 or more required)
Wetland Hyd Primary Indic Surface	drology Indicators: cators (minimum of o Water (A1)	ne require	Water-Sta	ined Leaves	s (B9) (e x	xcept ML		Vater-Stained Leaves (B9) (MLRA 1, 2,
Wetland Hyd Primary Indic Surface High Wa	drology Indicators: cators (minimum of o Water (A1) ater Table (A2)	ne require	Water-Sta	ined Leaves A, and 4B)	s (B9) (e x	xcept ML	RA V	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
Wetland Hyd Primary India Surface High Wa	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3)	ne require	Water-Sta 1, 2, 4 Salt Crust	nined Leaves A, and 4B) (B11)		xcept MLI	RA V	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10)
Wetland Hyd Primary India Surface High Wa Saturatia Water M	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1)	ne require	Water-Sta 1, 2, 4/ Salt Crust Aquatic In	ined Leaves A, and 4B) (B11) vertebrates	(B13)	xcept ML	RA V	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2)
Wetland Hyd Primary India Surface High Wa Saturatio Water M Sedimer	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2)	ne require	Water-Sta 1, 2, 44 Salt Crust Aquatic In Hydrogen	ined Leaves A, and 4B) (B11) vertebrates Sulfide Odo	(B13) or (C1)		RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Staturation Visible on Aerial Imagery (C9)
Wetland Hyden Primary Indice Surface High Was Saturation Water M Sedimer Drift Dep	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) posits (B3)	ne require	Water-Sta 1, 2, 4,4 Salt Crust Aquatic In Hydrogen Oxidized F	nined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere	(B13) or (C1) es along I	Living Roo	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
Wetland Hyd Primary India Surface High Wa Saturatia Water M Sedimer Drift Dep Algal Ma	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4)	ne require	Water-Sta 1, 2, 4,4 Salt Crust Aquatic In Hydrogen Oxidized F Presence	ined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced	(B13) or (C1) es along I Iron (C4	Living Roo	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Prainage Patterns (B10) Pry-Season Water Table (C2) Praturation Visible on Aerial Imagery (C9) Promorphic Position (D2) Prainage Patterns (B10) Pry-Season Water Table (C2) Prainage Patterns (B10)
Wetland Hyd Primary India Surface High Wa Saturatia Water M Sedimer Drift Dep Algal Ma	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5)	ne require	Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Iro	A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction	(B13) or (C1) es along l Iron (C4 or in Tilled	Living Roo) d Soils (C6	V C C C C C C C C C	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Estaturation Visible on Aerial Imagery (C9)
Wetland Hyd Primary India Surface High Wa Saturatia Water M Sedimer Drift Dep Algal Ma Iron Dep Surface	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6)		Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Iro Stunted or	A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction	(B13) or (C1) es along l Iron (C4 or in Tilled	Living Roo) d Soils (C6	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Staturation Visible on Aerial Imagery (C9) Seomorphic Position (D2) Shallow Aquitard (D3) AC-Neutral Test (D5) Staised Ant Mounds (D6) (LRR A)
Wetland Hydelicon Primary India Surface High Water Management Sedimer Drift Dep Algal Management Surface Inundation	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I	magery (B	Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Iro Stunted or Other (Exp	A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction	(B13) or (C1) es along l Iron (C4 or in Tilled	Living Roo) d Soils (C6	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Estaturation Visible on Aerial Imagery (C9)
Wetland Hydelicon Primary India Surface High Was Saturation Water M Sedimer Drift Dep Algal Mas Iron Dep Surface Inundation Sparsely	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I y Vegetated Concave	magery (B	Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Iro Stunted or Other (Exp	A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction	(B13) or (C1) es along l Iron (C4 or in Tilled	Living Roo) d Soils (C6	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Staturation Visible on Aerial Imagery (C9) Seomorphic Position (D2) Shallow Aquitard (D3) AC-Neutral Test (D5) Staised Ant Mounds (D6) (LRR A)
Wetland Hyden Primary India Surface High Was Saturatia Water M Sedimer Drift Dep Algal Ma Iron Dep Surface Inundatia Sparsely	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I y Vegetated Concave vations:	magery (B e Surface (Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Iro Stunted or 7) Other (Exp	inined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction r Stressed P plain in Rem	(B13) or (C1) es along l Iron (C4 n in Tilled elants (D1 narks)	Living Roo) d Soils (Ce 1) (LRR A	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Staturation Visible on Aerial Imagery (C9) Seomorphic Position (D2) Shallow Aquitard (D3) AC-Neutral Test (D5) Staised Ant Mounds (D6) (LRR A)
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Wetland Hydelight Primary India Surface High Water Management Sedimer Drift Dep Algal Management Surface Inundation Sparsely Field Obsertion	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I y Vegetated Concave vations: er Present? Y	magery (B e Surface (es es	Water-Sta 1, 2, 4,4 Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Iro Stunted or 7) Other (Exp B8) No Depth (in No Depth (in	inined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction r Stressed P plain in Rem uches):	(B13) or (C1) es along l Iron (C4 n in Tillec Plants (D1 narks)	Living Roo) d Soils (Co 1) (LRR A	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Eaturation Visible on Aerial Imagery (C9) Dry-Seomorphic Position (D2) Ehallow Aquitard (D3) EAC-Neutral Test (D5) Eaised Ant Mounds (D6) (LRR A) Trost-Heave Hummocks (D7)
Wetland Hydelian Primary India Surface High Water Management Sedimer Drift Dep Algal Management Inundation Sparsely Field Obsert Surface Water Table Saturation Primary India	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I y Vegetated Concave vations: er Present? Y resent? Y Y	magery (B e Surface (es es	Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Irc Stunted or 7) Other (Exp B8)	inined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction r Stressed P plain in Rem uches):	(B13) or (C1) es along l Iron (C4 n in Tillec Plants (D1 narks)	Living Roo) d Soils (Co 1) (LRR A	RA	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Orainage Patterns (B10) Ory-Season Water Table (C2) Staturation Visible on Aerial Imagery (C9) Seomorphic Position (D2) Shallow Aquitard (D3) AC-Neutral Test (D5) Staised Ant Mounds (D6) (LRR A)
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Wetland Hyden Primary India Surface High Was Saturation Water Management Sedimer Drift Dep Algal Management Iron Dep Surface Inundation Sparsely Field Obsert Surface Water Table Saturation P (includes cap	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I y Vegetated Concave vations: er Present? Y resent? Y resent? Y resent? Y	magery (B e Surface (es es es	Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Irc Stunted or Other (Exp B8) No Depth (in No Depth (in	inined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction r Stressed P plain in Rem uches): ches):	(B13) or (C1) es along l Iron (C4 or in Tillect Plants (D1 earks)	Living Roo d Soils (C6 1) (LRR A	V C C C C C C C C C	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Eaturation Visible on Aerial Imagery (C9) Dry-Seomorphic Position (D2) Ehallow Aquitard (D3) EAC-Neutral Test (D5) Eaised Ant Mounds (D6) (LRR A) Trost-Heave Hummocks (D7)
Wetland Hyden Primary India Surface High Water Manager Sedimer Drift Dep Algal Manager Iron Dep Surface Inundati Sparsely Field Obsert Surface Water Table Saturation Pe (includes cape Describe Recognition	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I y Vegetated Concave vations: er Present? Y resent? Y resent? Y resent? Y	magery (B e Surface (es es es	Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Irc Stunted or Other (Exp B8) No Depth (in No Depth (in	inined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction r Stressed P plain in Rem uches): ches):	(B13) or (C1) es along l Iron (C4 or in Tillect Plants (D1 earks)	Living Roo d Soils (C6 1) (LRR A	V C C C C C C C C C	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Eaturation Visible on Aerial Imagery (C9) Dry-Seomorphic Position (D2) Ehallow Aquitard (D3) EAC-Neutral Test (D5) Eaised Ant Mounds (D6) (LRR A) Trost-Heave Hummocks (D7)
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Wetland Hyden Primary India Surface High Water Manager Sedimer Drift Dep Algal Manager Iron Dep Surface Inundati Sparsely Field Obsert Surface Water Table Saturation Pe (includes cape Describe Recognition	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) Soil Cracks (B6) on Visible on Aerial I y Vegetated Concave vations: er Present? Y resent? Y resent? Y resent? Y	magery (B e Surface (es es es	Water-Sta 1, 2, 4/ Salt Crust Aquatic In Hydrogen Oxidized F Presence Recent Irc Stunted or Other (Exp B8) No Depth (in No Depth (in	inined Leaves A, and 4B) (B11) vertebrates Sulfide Odo Rhizosphere of Reduced on Reduction r Stressed P plain in Rem uches): ches):	(B13) or (C1) es along l Iron (C4 or in Tillect Plants (D1 earks)	Living Roo d Soils (C6 1) (LRR A	V C C C C C C C C C	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Drainage Patterns (B10) Dry-Season Water Table (C2) Eaturation Visible on Aerial Imagery (C9) Dry-Seomorphic Position (D2) Ehallow Aquitard (D3) EAC-Neutral Test (D5) Eaised Ant Mounds (D6) (LRR A) Trost-Heave Hummocks (D7)

Project/Site: Orcas Island Airport			City/Co	_{ounty:} San Juar	n County	_ Sampling Date: 11/	/8/13
Applicant/Owner: Orcas Island Airpo		c, Inc.			State: WA	_ Sampling Point: 16	
Investigator(s): A. Bachman & S. Bi	ainard	;	Section	n, Township, Ra	nge: S11, T37N, R2W		
Landform (hillslope, terrace, etc.): Dr	ainageways		Local	relief (concave,	convex, none): Concav	e Slope	(%): <u>0-5</u>
Subregion (LRR): LRR-A		Lat: <u>48°</u> 4	42'17.9	96"N	Long: 122°54'33.06"	W Datum:	
Soil Map Unit Name: Sholander-Spi	eden complex, 0	to 5 percent sl	opes		NWI classif	ication:	
Are climatic / hydrologic conditions or	the site typical for	this time of year	ar? Ye	es_ / _ No_	(If no, explain in	Remarks.)	
Are Vegetation, Soil,	or Hydrology	significantly	disturb	ed? Are "	'Normal Circumstances"	present? Yes_ 🗸	_ No
Are Vegetation, Soil,					eeded, explain any answ	ers in Remarks.)	
SUMMARY OF FINDINGS -	Attach site ma	ap showing	sam	pling point le	ocations, transect	s, important feat	ures, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸			Is the Sampled	Area		
Hydric Soil Present?	Yes	No		within a Wetlar		No_ 🗸	
Wetland Hydrology Present? Remarks:	Yes	No					
VEGETATION – Use scientif	ic names of pl	ants.	Domi	inant Indicator	Dominance Test wor	ksheet:	
Tree Stratum (Plot size:	,	% Cover	Spec	ies? Status	Number of Dominant That Are OBL, FACW	Species	(A)
2					Total Number of Dom Species Across All St	4	(B)
4. Sapling/Shrub Stratum (Plot size: _					Percent of Dominant S That Are OBL, FACW	Species , or FAC: 100	(A/B)
1					Prevalence Index wo	orksheet:	
2						Multiply b	-
3						x 1 =	
4					· · ·	x 2 =	
5					· ·	x 3 = x 4 =	
Herb Stratum (Plot size:)	-	_= 10ta	ai Cover		x 5 =	
1. Poa annua	·	80	Υ	Fac		(A)	
2. Trifolium pratense		5	N	FacU			
3. Holcus lanatus		5	N	<u>Fac</u>		ex = B/A =	
4					Hydrophytic Vegetat		
5					✓ Dominance Test i		
6						lis ≤3.0 aptations¹ (Provide su	pporting
7						ks or on a separate sh	
8 9					Wetland Non-Vas	cular Plants ¹	
10					Problematic Hydr	ophytic Vegetation ¹ (E	xplain)
11.						oil and wetland hydrolo sturbed or problematic.	
		90	= Tota	al Cover	be present, unless us	turbed of problematic.	
Woody Vine Stratum (Plot size:	,						
1					Hydrophytic Vegetation		
2						es No	
% Bare Ground in Herb Stratum			_= I ota	al Cover			
Remarks:					1		

SOIL Sampling Point: 16

Profile Des	cription: (Descri	be to the de	pth neede	ed to docun	nent the i	ndicator	or confirn	n the absence	of indicato	ors.)	
Depth	Matrix				x Features	3		_		_	
(inches)	Color (moist)	%	<u>Color</u>	r (moist)	%	Type ¹	Loc ²	<u>Texture</u>		Remarks	
0-8	10YR 3/2							Fine Sa Lo	Moist		
8-18	10YR 4/3							Fine Sa Lo	Moist		
			-								
l ———											
1T 0. 0			4 Dadwaa	al Matrice OC				: 21 -		Dana Linina A	A Matrix
	oncentration, D=D Indicators: (App						ed Sand G			Pore Lining, Note Not	_
-		ilicable to al				zu.)				-	ic soils .
Histosol	pipedon (A2)			dy Redox (Soped Matrix					m Muck (A1) d Parent Mai		
	istic (A3)			my Mucky N	` '	l) (except	MIRA 1)		er (Explain i	` ,	
	en Sulfide (A4)			my Gleyed I	•		,		ioi (Explaii)	ii rtomantoj	
	d Below Dark Sur	ace (A11)		leted Matrix		,					
Thick D	ark Surface (A12)	, ,	Red	lox Dark Sui	rface (F6)			³ Indicate	ors of hydror	ohytic vegetat	ion and
Sandy N	Mucky Mineral (S1)	Dep	leted Dark S	Surface (F	7)		wetla	and hydrolog	y must be pre	esent,
	Gleyed Matrix (S4)		Red	lox Depress	ions (F8)			unles	ss disturbed	or problemati	c.
Restrictive	Layer (if present)):									
Type:											,
Depth (in	ches):							Hydric Soil	Present?	Yes	No
HYDROLO	GY										
Wetland Hy	drology Indicato	rs:									
	cators (minimum o	of one require	ed; check a	all that apply	y)			Seco	ndary Indica	tors (2 or mor	<u>e required)</u>
Surface	Water (A1)			Water-Stai	ned Leave	es (B9) (e :	xcept ML	RA V	Vater-Staine	d Leaves (B9) (MLRA 1, 2,
High Wa	ater Table (A2)			1, 2, 4A	, and 4B))			4A, and 4	В)	
Saturati	on (A3)			Salt Crust	(B11)			[Orainage Pat	terns (B10)	
Water N	/larks (B1)			Aquatic Inv	ertebrate:	s (B13)			•	Water Table (•
Sedime	nt Deposits (B2)			Hydrogen	Sulfide Od	dor (C1)		s	Saturation Vi	sible on Aeria	I Imagery (C9)
	posits (B3)					_	_	ots (C3) C	Seomorphic	Position (D2)	
	at or Crust (B4)			Presence of		`	,		Shallow Aqui		
	posits (B5)			Recent Iro				•	AC-Neutral	. ,	
	Soil Cracks (B6)			Stunted or		•	1) (LRR A	•		lounds (D6) (I	
	on Visible on Aeri	• • •	•	Other (Exp	lain in Re	marks)		. F	rost-Heave	Hummocks (E	07)
	y Vegetated Conc	ave Surface	(B8)								
Field Obser											
Surface Wat	er Present?			_ Depth (ind							
Water Table	Present?	Yes	No	_ Depth (ind	ches):						
Saturation P		Yes	No	_ Depth (ind	ches):		Wetl	and Hydrolog	y Present?	Yes	_ No <u> </u>
	pillary fringe) corded Data (stre	am dalide m	onitoring	well aerial r	photoe pro	avious ins	nections)	if available:			
Describe IVe	colded Data (Sile	am gauge, n	ionitoning	well, aeriai p	oriotos, pre	evious ilis	pections),	ii available.			
December											
Remarks:											

Project/Site: Orcas Island Airport			City/Co	_{ounty:} San Juar	n County	_ Sampling Date: 11	/8/13
Applicant/Owner: Orcas Island Airpo		c, Inc.			State: WA	_ Sampling Point: <u>17</u>	
Investigator(s): A. Bachman & S. Br	ainard	;	Section	n, Township, Ra	nge: S11, T37N, R2W		
Landform (hillslope, terrace, etc.): Dr	ainageways		Local	relief (concave,	convex, none): Concav	e Slope	(%): <u>0-5</u>
Subregion (LRR): LRR-A		Lat: 48°4	42'17.	96"N	Long: 122°54'33.06"	W Datum:	
Soil Map Unit Name: Sholander-Spi	eden complex, 0 t	to 5 percent sl	opes		NWI classif	ication:	
Are climatic / hydrologic conditions on	the site typical for	this time of year	ar? Ye	es _ 🗸 _ No _	(If no, explain in	Remarks.)	
Are Vegetation, Soil, c	or Hydrology	significantly	disturb	ed? Are '	'Normal Circumstances"	present? Yes_	No
Are Vegetation, Soil, c					eeded, explain any answ	ers in Remarks.)	
SUMMARY OF FINDINGS -	Attach site ma	ap showing	sam	pling point l	ocations, transect	s, important feat	ures, etc.
Hydrophytic Vegetation Present?	Yes_ 🗸			Is the Sampled	l Area		
Hydric Soil Present?	Yes	No		within a Wetlar		No_ 🗸	
Wetland Hydrology Present? Remarks:	Yes	No					
VEGETATION – Use scientif	ic names of pl	ants.	Domi	inant Indicator	Dominance Test wor	ksheet:	
Tree Stratum (Plot size:	,	% Cover	Spec	ies? Status	Number of Dominant That Are OBL, FACW	Species	(A)
2					Total Number of Dom Species Across All St	4	(B)
4. Sapling/Shrub Stratum (Plot size: _					Percent of Dominant S That Are OBL, FACW	Species , or FAC: 100	(A/B)
1					Prevalence Index wo	rksheet:	
2						Multiply b	
3						x 1 =	
4						x 2 = x 3 =	
5					·	x 4 =	
Herb Stratum (Plot size:)		_= 1016	ai Covei		x 5 =	
1. Poa annua		80	Y			(A)	
2. Trifolium pratense		5	N	FacU			
3. Holcus lanatus		5	N	Fac Fac		ex = B/A =	
4					Hydrophytic Vegetat Dominance Test		
5					Prevalence Index		
6						aptations ¹ (Provide su	pporting
8.						ks or on a separate sh	
9					Wetland Non-Vas		
10					1	ophytic Vegetation ¹ (E	. ,
11						oil and wetland hydrolo sturbed or problematic.	
		90	= Tota	al Cover			
Woody Vine Stratum (Plot size: 1	,				Hydrophytic		
2					Vegetation Present? Y	es_	
% Bare Ground in Herb Stratum			= Tota	al Cover			_
Remarks:	-						

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features (Inches) Color (moist) % Color (moist) % Type¹ Loc² Texture Remarks 0-2 10YR 2/2 Sa Lo Moist 2-18 10YR 4/2 Lo sa Moist Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Remarks O-2 10YR 2/2 Sa Lo Moist Lo sa Moist Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Indicators (Moist Lo sa Moist Lo	
Depth Matrix Redox Features Color (moist) % Type¹ Loc² Texture Remarks 0-2 10YR 2/2 2-18 10YR 4/2	Sampling Point: 17
Color (moist) % Color (moist) % Type¹ Loc² Texture Remarks O-2 10YR 2/2	dicator or confirm the absence of indicators.)
1 Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. 1 Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. 1 Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) 1 Histosol (A1) 1 Histosol (A1) 2 Cm Muck (A10) 3 Histic Epipedon (A2) 4 Histic Epipedon (A2) 5 Black Histic (A3) 4 Hydrogen Sulfide (A4) 5 Loamy Mucky Mineral (F1) (except MLRA 1) 5 Loamy Gleyed Matrix (F2) 5 Depleted Below Dark Surface (A11) 5 Depleted Matrix (F3)	
2-18 10YR 4/2 Lo sa Moist Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Sandy Redox (S5) Indicators for Problematic Hydric Soils Histosol (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Other (Explain in Remarks) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Depleted Below Dark Surface (A11) Depleted Matrix (F3)	<u> </u>
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Indicators: PL=Pore Lining, M=Matrix Indicators for Problematic Hydric Soils 2 cm Muck (A10) Red Parent Material (TF2) Other (Explain in Remarks)	Sa Lo Moist
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) — Histosol (A1) — Histosol (A2) — Black Histic (A3) — Hydrogen Sulfide (A4) — Depleted Below Dark Surface (A11) — Depleted Below Dark Surface (A11) — Hydrogen Sulfide (A4) — Depleted Matrix (F3) — Indicators for Problematic Hydric Soils — 2 cm Muck (A10) — Red Parent Material (TF2) — Other (Explain in Remarks) — Other (Explain in Remarks)	Lo sa Moist
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) — Histosol (A1) — Histosol (A2) — Black Histic (A3) — Hydrogen Sulfide (A4) — Depleted Below Dark Surface (A11) — Depleted Below Dark Surface (A11) — Hydrogen Sulfide (A4) — Depleted Matrix (F3) — Indicators for Problematic Hydric Soils — 2 cm Muck (A10) — Red Parent Material (TF2) — Other (Explain in Remarks) — Other (Explain in Remarks)	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) — Histosol (A1) — Histosol (A2) — Black Histic (A3) — Hydrogen Sulfide (A4) — Depleted Below Dark Surface (A11) — Depleted Below Dark Surface (A11) — Hydrogen Sulfide (A4) — Depleted Matrix (F3) — Indicators for Problematic Hydric Soils — 2 cm Muck (A10) — Red Parent Material (TF2) — Other (Explain in Remarks) — Other (Explain in Remarks)	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Indicators for Problematic Hydric Soils 2 cm Muck (A10) Red Parent Material (TF2) Other (Explain in Remarks)	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Indicators for Problematic Hydric Soils 2 cm Muck (A10) Red Parent Material (TF2) Other (Explain in Remarks)	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Indicators for Problematic Hydric Soils 2 cm Muck (A10) Red Parent Material (TF2) Other (Explain in Remarks)	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Indicators for Problematic Hydric Soils 2 cm Muck (A10) Red Parent Material (TF2) Other (Explain in Remarks)	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Indicators for Problematic Hydric Soils 2 cm Muck (A10) Red Parent Material (TF2) Other (Explain in Remarks)	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Indicators for Problematic Hydric Soils 2 cm Muck (A10) Red Parent Material (TF2) Other (Explain in Remarks)	or Coated Sand Grains ² Location: PL=Pore Lining M=Matrix
Histosol (A1) Sandy Redox (S5) Stripped Matrix (S6) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Depleted Matrix (F2) Depleted Matrix (F3)	9,
Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11) Stripped Matrix (S6) Loamy Mucky Mineral (F1) (except MLRA 1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Red Parent Material (TF2) Other (Explain in Remarks)	
Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Depleted Below Dark Surface (A11) Depleted Matrix (F3)	Red Parent Material (TF2)
Depleted Below Dark Surface (A11) Depleted Matrix (F3)	(except MLRA 1) Other (Explain in Remarks)
	31
Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present,	
Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic.	
Restrictive Layer (if present):	anneed distallined or problematic.
Type:	
Depth (inches): Hydric Soil Present? Yes No	Hydric Soil Present? Yes No
Remarks:	
HYDROLOGY	
Wetland Hydrology Indicators:	
	Secondary Indicators (2 or more required)
High Water Table (A2)	
Saturation (A3) Salt Crust (B11) Drainage Patterns (B10)	•
Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2)	
Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2)	s along Living Roots (C3) Geomorphic Position (D2)
Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Shallow Aquitard (D3)	Iron (C4) Shallow Aquitard (D3)
Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) FAC-Neutral Test (D5)	in Tilled Soils (C6) FAC-Neutral Test (D5)
Surface Soil Cracks (B6) Stunted or Stressed Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A)	lants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A)
Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7)	arks) Frost-Heave Hummocks (D7)
Sparsely Vegetated Concave Surface (B8)	
Field Observations:	
Surface Water Present? Yes No Depth (inches):	
Water Table Present? Yes No Depth (inches):	
Saturation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Wetland Hydrology Present? Yes No

Remarks:

Project/Site: Orcas Island Airport	(City/Co	_{unty:} San Juar	n County	Samplin	g Date: 11/8/1	3
Applicant/Owner: Orcas Island Airport (c/o WH Pacific, I				State: WA	Samplin	g Point: 18	
Investigator(s): A. Bachman & S. Brainard		Section	n, Township, Rai	nge: S11, T37N, R2W			
				convex, none): Concave		Slope (%)	. 0-5
Subregion (LRR): LRR-A							
Soil Map Unit Name: Sholander-Spieden complex, 0 to 5				NWI classific			
Are climatic / hydrologic conditions on the site typical for thi							
Are Vegetation, Soil, or Hydrologys	-			'Normal Circumstances"		Yes 🗸 N	lo
Are Vegetation, Soil, or Hydrologyr				eeded, explain any answe			
SUMMARY OF FINDINGS – Attach site map							es, etc.
Hydrophytic Vegetation Present? Yes _ ✔ _ N	lo.						
Hydric Soil Present? Yes _ V _ N			Is the Sampled		,		
Wetland Hydrology Present? Yes N	lo		within a Wetlar	nd? Yes_ <u>✓</u>	No		
Remarks:		l .					
VEGETATION – Use scientific names of plan							
Tree Stratum (Plot size:)	Absolute % Cover		nant Indicator es? Status	Dominance Test work			
1				Number of Dominant S That Are OBL, FACW,		2	(A)
2				Total Number of Domir		0	
3				Species Across All Stra	ata:	2	(B)
4			al Cover	Percent of Dominant S That Are OBL, FACW,		100	(A/B)
1				Prevalence Index wor	ksheet:		
2				Total % Cover of:		Multiply by:	
3				OBL species			
4.				FACW species	x	2 =	
5				FAC species	x	3 =	_
		_ = Tota	al Cover	FACU species	x	4 =	_
Herb Stratum (Plot size:) 1. Juncus ensifolius	35	V	FacW	UPL species	x	5 =	_
2. Juncus effusus	20	Y	FacW	Column Totals:	(A)	(B)
3. Carex obnupta	15	N	Obl	Prevalence Index	r = B/A =		
4 Holcus lanatus	10	N	Fac	Hydrophytic Vegetation			_
5. Sisyrinchium californicum	5	N	FacW	Dominance Test is			
6. Poa annua	5	N	Fac	Prevalence Index i	s ≤3.0 ¹		
7.				Morphological Ada	ptations1	(Provide suppo	rting
8.				data in Remark)
9.				Wetland Non-Vaso			
10				Problematic Hydro			•
11				¹ Indicators of hydric so be present, unless dist			must
	90	= Tota	l Cover	,			
Woody Vine Stratum (Plot size:)							
1				Hydrophytic Vegetation			
2					s	No	
% Bare Ground in Herb Stratum		_= 10ta	l Cover				
Remarks:				I.			

SOIL

Sampling Point: 18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix			ox Feature						
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type ¹	<u>Loc²</u>	<u>Texture</u>		Remarks	
0-18	2.5Y 4/2		10YR 4/6	5			Sa lo	Moist		
					-					
-	-				-			-		
	-	· —— -								
				_						
	oncentration, D=Dep					ed Sand Gr			ore Lining, M=	
-	Indicators: (Applic	able to all I			ed.)				ematic Hydric	; Soils":
Histosol	` '		Sandy Redox (,			· 	n Muck (A10	,	
	pipedon (A2) istic (A3)		Stripped Matrix Loamy Mucky	` '	1) (evcen	+ MI DA 1\		l Parent Mate er (Explain ir	, ,	
	en Sulfide (A4)	,	Loamy Gleyed	•		LIVILNA I)	Oth	ei (Expiaiii ii	i Kemarks)	
	d Below Dark Surfac	e (A11)	✓ Depleted Matri		.,					
	ark Surface (A12)	. (, , , ,	Redox Dark Su				³ Indicato	ors of hydrop	hytic vegetatio	n and
	Mucky Mineral (S1)		Depleted Dark		7)				must be pres	
-	Gleyed Matrix (S4)	,	Redox Depress	•	,				or problematic.	
Restrictive	Layer (if present):									
Type:										
Depth (in	ches):						Hydric Soil	Present?	Yes	No
Remarks:	•									
1										
HYDROLO	GY									
Wetland Hy	drology Indicators:									
Primary Indi	cators (minimum of o	ne required	; check all that app	ly)			Secoi	ndary Indicat	ors (2 or more	required)
Surface	Water (A1)		Water-Sta	ained Leav	es (B9) (except MLF	RA V	Vater-Stained	d Leaves (B9) (MLRA 1, 2,
High Wa	ater Table (A2)			A, and 4B	. , .	•		4A, and 4I		
Saturati	, ,		Salt Crust		•		✓ D	rainage Patt	•	
	/larks (B1)			vertebrate	s (B13)			-	Vater Table (C2	2)
Sedime	nt Deposits (B2)		Hydrogen		, ,		_	-	ible on Aerial I	*
	posits (B3)					Living Roc	ots (C3) G			3 , , ,
	at or Crust (B4)			of Reduce	-	•	, ,	hallow Aquit	, ,	
Iron De	posits (B5)		Recent Iro	on Reducti	on in Tille	ed Soils (C6		AC-Neutral ⁻		
Surface	Soil Cracks (B6)					01) (LRR A		aised Ant M	ounds (D6) (LF	RRA)
	ion Visible on Aerial I	magery (B7						rost-Heave I	Hummocks (D7	·)
Sparsel	y Vegetated Concave	Surface (B	,		,				•	,
Field Obser		<u> </u>	,							
Surface Wat	ter Present? Y	es N	lo Depth (in	nches):						
Water Table			lo Depth (in							
Saturation P			lo Depth (in				and Hydrolog	v Present?	Vos V	No
	pillary fringe)	es i	io Deptii (iii	iciies)		*****	and mydrolog	y r resent:	165	140
	corded Data (stream	gauge, moi	nitoring well, aerial	photos, pr	evious ins	spections),	if available:			
Remarks:										

Project/Site: Orcas Island Airport	n County	Sampling	ampling Date: 11/8/13					
Applicant/Owner: Orcas Island Airport	(c/o WH Pacific,	Inc.			State: WA	Sampling	mpling Point: 19	
Investigator(s): A. Bachman & S. Brai	nard		Section	n, Township, Ra	nge: S11, T37N, R2W			
Landform (hillslope, terrace, etc.): Drain	nageways		Local r	relief (concave,	convex, none): Concav	е	Slope (%	6): <u>0-5</u>
		Lat: 48°4	42'17.9	96"N	Long: 122°54'33.06"\	W	Datum:	
Soil Map Unit Name: Sholander-Spied					NWI classifi			
Are climatic / hydrologic conditions on the	ne site typical for the	his time of yea	ar? Ye					
Are Vegetation, Soil, or		-			'Normal Circumstances"		Yes _ 🗸 _	No
Are Vegetation, Soil, or					eeded, explain any answ			
SUMMARY OF FINDINGS - A								res, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸	No		la tha Cammiad	1.4		-	
Hydric Soil Present? Yes		No 🗸		Is the Sampled within a Wetlar		No	No _ 🗸	
Wetland Hydrology Present?	Yes	No _ 🗸		Willilli a Wellai	iu: 165	NO_		
Remarks:								
VEGETATION – Use scientific	names of pla	nts.						
T 0: 10 10 10 10 10 10 10 10 10 10 10 10 10		Absolute		nant Indicator	Dominance Test wor	ksheet:		
Tree Stratum (Plot size:1				ies? Status	Number of Dominant S That Are OBL, FACW,		1	(A)
2					Total Number of Domi Species Across All Str		1	(B)
4		=		al Cover	Percent of Dominant S That Are OBL, FACW,		100	(A/B)
Sapling/Shrub Stratum (Plot size:					Prevalence Index wo			
1 2					Total % Cover of:		Multiply by:	
3					OBL species			
4					FACW species			
5					FAC species	x 3	i =	
					FACU species	x 4	· =	
Herb Stratum (Plot size:)	00		-	UPL species	x 5	=	
1. Poa annua Trifolium protonco		80	N	Fac FacII	Column Totals:	(A)		(B)
2. Trifolium pratense 3. Holcus lanatus		5	N	FacU Fac	Prevalence Inde	v - B/A -		
° .					Hydrophytic Vegetat			
4. 5.					✓ Dominance Test is			
6					Prevalence Index			
7					Morphological Ad			
8					data in Remark Wetland Non-Vas			:τ)
9					Problematic Hydro			vlain)
10					¹ Indicators of hydric so			,
11					be present, unless dis			y must
Woody Vine Stratum (Plot size:	1	90	= Total	l Cover				
1	*				Hydrophytic			
2.					Vegetation			
				I Cover	Present? Y	es _ 🗸 _	No	•
% Bare Ground in Herb Stratum			. 5.0					
Remarks:								

SOIL Sampling Point: 19										
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)										
Depth	Matrix Redox Features									
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks		

Depth	. Matrix		Redo	x Features			•				
(inches)	Color (moist)	%	Color (moist)		pe ¹ Loc ²	Texture	Remarks				
0-2	10YR 2/2		,	-		Sa Lo	Moist				
2-18	10YR 4/2			·		Lo sa	Moist				
2-10	1011(4/2		-				IVIOIST				
				·							
						_					
			-								
											
¹Type: C=Co	ncentration D=C	enletion RM	=Reduced Matrix, CS	S=Covered or C	Coated Sand	Grains ² I	Location: PL=Pore Lining, M=Matrix.				
			LRRs, unless other		Joaica Garia		ators for Problematic Hydric Soils ³ :				
Histosol			Sandy Redox (cm Muck (A10)				
	pipedon (A2)		Stripped Matrix	•			ed Parent Material (TF2)				
Black Hi			Loamy Mucky M	` '	cept MLRA						
	n Sulfide (A4)		Loamy Gleyed			,					
	d Below Dark Surf	ace (A11)	Depleted Matrix	, ,							
	ark Surface (A12)		Redox Dark Su			³ Indica	³ Indicators of hydrophytic vegetation and				
Sandy M	lucky Mineral (S1)	Depleted Dark	Surface (F7)		wei	tland hydrology must be present,				
Sandy G	leyed Matrix (S4)		Redox Depress	ions (F8)		unl	ess disturbed or problematic.				
Restrictive L	_ayer (if present)	:									
Type:											
Depth (inc	ches):					Hydric So	oil Present? Yes No				
Remarks:											
IYDROLO	GY										
Wetland Hyd	drology Indicato	rs:									
Primary Indic	ators (minimum o	of one require	d; check all that appl	y)		Sec	condary Indicators (2 or more required)				
	Water (A1)			ined Leaves (B	9) (except N	//LRA	Water-Stained Leaves (B9) (MLRA 1, 2,				
	iter Table (A2)			A, and 4B)	o) (except ii	4A, and 4B)					
Saturation			Salt Crust			Drainage Patterns (B10)					
	` '			` '	13)	Dry-Season Water Table (C2)					
	Water Marks (B1) Aquatic Invertebrates (B13) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1)						Saturation Visible on Aerial Imagery (C9)				
	Sediment Deposits (B2) Hydrogen Sulfide Odor (C1)										
Drift Deposits (B3) Algal Mat or Crust (B4) Oxidized Rhizospheres along Living Ro Presence of Reduced Iron (C4)							Shallow Aquitard (D3)				
Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6											
Surface Soil Cracks (B6) Stunted or Stressed Plants (D1) (LRR A							Raised Ant Mounds (D6) (LRR A) Frost-Heave Hummocks (D7)				
	Vegetated Conc			nam m ræmalk	<i>)</i>		1 1031-1 leave 1 lullilliocks (DI)				
Field Observ		ave Juliace (50)		ı						
		V	Na Danth (in	-h\·							
Surface Water			No Depth (in								
Water Table			No Depth (in	,							
Saturation Present? Yes No Depth (inches): Wet (includes capillary fringe)							Vetland Hydrology Present? Yes No <u>✓</u>				
		am dalide mo	onitoring well, aerial	nhotos previou	ıs inspection	s) if available:					
_ 000.100 1100	23.404 2414 (5116)	an gaago, m	January Woll, Gorial	, provido	.c mopodion	o,, ii avaliabio.					
Domorto											
Remarks:											

Project/Site: Orcas Island Airport	(City/Cou	_{unty:} San Juar	n County	Samplin	ng Date: 11/8	/13	
Applicant/Owner: Orcas Island Airport (c/o WH Pacific					Samplin	ampling Point: 20		
Investigator(s): A. Bachman & S. Brainard	;	Section	, Township, Ra	nge: S11, T37N, R2W				
Landform (hillslope, terrace, etc.): Drainageways		Local re	elief (concave, o	convex, none): Concave	Э	Slope (%	%): <u>0-5</u>	
Subregion (LRR): LRR-A	Lat: 48°4	42'17.9	6"N	Long: 122°54'33.06"\	N	Datum:		
Soil Map Unit Name: Sholander-Spieden complex, 0 to				NWI classifi				
Are climatic / hydrologic conditions on the site typical for	this time of ve							
Are Vegetation, Soil, or Hydrology	-			Normal Circumstances"			No	
Are Vegetation, Soil, or Hydrology				eded, explain any answ				
SUMMARY OF FINDINGS – Attach site ma							res, etc.	
Hydrophytic Vegetation Present? Yes _ ✔	No							
Hydric Soil Present? Yes _ ✔ _	No within a Wotl			•				
Wetland Hydrology Present? Yes _ 🗸 _	No	'	WILLIIII a VVELIAI	nd? Yes No No No				
Remarks:								
VEGETATION – Use scientific names of pla	ants.							
	Absolute		nant Indicator	Dominance Test wor	ksheet:			
Tree Stratum (Plot size:) 1		Species? Status		Number of Dominant S That Are OBL, FACW,		3	(A)	
2				Total Number of Domi Species Across All Str		3	(B)	
4.							(-)	
Sapling/Shrub Stratum (Plot size:)		= Total Cover		Percent of Dominant S That Are OBL, FACW,				
1				Prevalence Index wo	rksheet:			
2				Total % Cover of:		Multiply by:		
3				OBL species	x	1 =		
4				FACW species	x	2 =		
5				FAC species				
Horb Stratum (Plot aiza:		= Tota	l Cover	FACU species				
Herb Stratum (Plot size:) 1. Juncus ensifolius	30	Υ	FacW	UPL species				
2. Juncus effusus	30	Υ	FacW	Column Totals:	(A	ι)	(B)	
3. Juncus acuminatus	20	Υ	Obl	Prevalence Index	κ = B/A =			
4. Sisyrinchium californicum	10	N	FacW	Hydrophytic Vegetati				
5. Holcus lanatus	10	N	Fac	<u>✓</u> Dominance Test is	s >50%			
6				Prevalence Index	is ≤3.0 ¹			
7				Morphological Ada	aptations ¹	(Provide supp	oorting	
8				data in Remark Wetland Non-Vase			et)	
9				Problematic Hydro			oloin)	
10				¹ Indicators of hydric so	. ,		,	
11				be present, unless dist			ly illust	
Mandy Vine Stratum (Diet eine	100	= Total	Cover					
Woody Vine Stratum (Plot size:)				Hydrophytic				
1 2				Vegetation				
				Present? Yo	es/_	No	_	
% Bare Ground in Herb Stratum		_ 10(0)						
Remarks:					_	_		

SOIL								Sampling Point: 20
Profile Des	cription: (Describe t	o the dep	th needed to docum	ent the	indicator of	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	Feature	S			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks

Depth (inches)	Color (moist)	<u></u> %		<u>x Features</u> %	Type ¹	Loc ²	Texture	Remarks
(inches) 0-18+	Color (moist) 10YR 4/1		Color (moist) 0YR 3/6	5	туре	LUC	` <u> </u>	Moist
0-10+	101K 4/1		UTK 3/6	<u> </u>			Lo sa	MOIST
¹Type: C=Co	oncentration, D=Depl	etion RM=R	educed Matrix CS	S=Covered	or Coate	d Sand Gr	ains ² l o	ocation: PL=Pore Lining, M=Matrix.
	Indicators: (Applica					a cana ch		ors for Problematic Hydric Soils ³ :
Histosol			Sandy Redox (,			m Muck (A10)
	pipedon (A2)	i.	Stripped Matrix					d Parent Material (TF2)
Black Hi		i.	Loamy Mucky N	` ') (except	MIRA 1)		ner (Explain in Remarks)
	n Sulfide (A4)	ů.	Loamy Gleyed			. III E ()	Ott	ici (Explain in Norhano)
	d Below Dark Surface	(A11)	Depleted Matrix					
	ark Surface (A12)	(/ () /)	Redox Dark Su				³ Indicate	ors of hydrophytic vegetation and
	lucky Mineral (S1)	•	Depleted Dark	, ,	7)			and hydrology must be present,
-	Gleyed Matrix (S4)	i.	Redox Depress		')			ss disturbed or problematic.
	_ayer (if present):	*	Trodox Boprood	10110 (1 0)			1	oo dictarbed of problematic.
	zayer (ii present).							
Type:			_					
Depth (in	ches):						Hydric Soi	I Present? Yes No
Remarks:								
HYDROLO	GY							
_	drology Indicators:			,				
	cators (minimum of or	<u>ne requirea; (</u>						endary Indicators (2 or more required)
	Water (A1)		Water-Sta	ned Leave	s (B9) (e	xcept MLR	RA \	Water-Stained Leaves (B9) (MLRA 1, 2
High Wa	iter Table (A2)		1, 2, 4	, and 4B)				4A, and 4B)
Saturation	on (A3)		Salt Crust	(B11)			<u>~</u> [Orainage Patterns (B10)
Water M	arks (B1)		Aquatic In	vertebrates	(B13)		[Dry-Season Water Table (C2)
Sedimer	nt Deposits (B2)		Hydrogen	Sulfide Od	or (C1)		<u>v</u> 9	Saturation Visible on Aerial Imagery (C
Drift Dep	oosits (B3)		Oxidized F	Rhizospher	es along	Living Roo	ts (C3) (Geomorphic Position (D2)
Algal Ma	at or Crust (B4)		Presence	of Reduced	d Iron (C4	1)	8	Shallow Aquitard (D3)
Iron Dep	osits (B5)		Recent Iro	n Reductio	n in Tille	d Soils (C6) ~ F	FAC-Neutral Test (D5)
	Soil Cracks (B6)		Stunted or	Stressed I	Plants (D	1) (LRR A)	,) F	Raised Ant Mounds (D6) (LRR A)
	on Visible on Aerial Ir	nagery (B7)	Other (Exp			, (,		Frost-Heave Hummocks (D7)
	Vegetated Concave	,						
Field Obser		- Canaco (Bo	/					
		.a Na	Donth /in	ah aa).				
Surface Wat			_ Depth (inc					
Water Table			Depth (in					
Saturation P		es No	Depth (inc	ches):		_ Wetla	and Hydrolog	gy Present? Yes 🔽 No
(includes cap	oillary fringe) corded Data (stream	gauga mani	toring wall parial	photos pro	vious inc	nactions)	if available:	
Describe Ker	Colueu Dala (Silealii	gauge, mom	toring well, aeriai į	onotos, pre	vious ilis	peciions),	ii avaiiabie.	
Remarks:								

Project/Site: Orcas Island Airport		(City/Co	_{unty:} San Juar	n County	Sampling Date: 1	1/8/13
Applicant/Owner: Orcas Island Airpor	t (c/o WH Pacifi	c, Inc.			State: WA	Sampling Point: 2	1
Investigator(s): A. Bachman & S. Bra	inard	;	Section	n, Township, Ra	nge: S11, T37N, R2W	1	
Landform (hillslope, terrace, etc.): Dra					convex, none): Concav		e (%): 0-5
					Long: 122°54'33.06"		
Soil Map Unit Name: Sholander-Spie					NWI classi		
Are climatic / hydrologic conditions on t				_			
Are Vegetation, Soil, or		•			'Normal Circumstances'		No
Are Vegetation, Soil, or					eeded, explain any answ		
SUMMARY OF FINDINGS - A							ıtures, etc.
Hydrophytic Vegetation Present?	Yes _ 🗸 _	No		Is the Sampled	Area	-	
Hydric Soil Present?	Yes	No _ 🗸		within a Wetlar		No_ 🗸	
Wetland Hydrology Present? Remarks:	Yes	No					
VEGETATION – Use scientific	names of pl						
Tree Stratum (Plot size:			Speci	nant Indicator es? Status	Number of Dominant That Are OBL, FACW	Species	(A)
3			-		Total Number of Dom Species Across All St		(B)
4					Percent of Dominant That Are OBL, FACW		(A/B)
1					Prevalence Index wo		
2						: Multiply	-
3					OBL species		
4					FACW species		
5					FACU species		
Herb Stratum (Plot size:)		_= 1018	ai Covei	UPL species		
1. Poa annua				Fac	Column Totals:		
2. Holcus lanatus			N	<u>Fac</u>			
3. Trifolium pratense		10	N	FacU		ex = B/A =	
4					Hydrophytic Vegetar Dominance Test		
5					Prevalence Index		
6					Morphological Ac	daptations¹ (Provide s rks or on a separate s	upporting sheet)
8					Wetland Non-Vas		,
9					Problematic Hydr	rophytic Vegetation ¹ (Explain)
10					¹ Indicators of hydric s		
· · ·			= Total	I Cover	be present, unless dis	sturbed or problemation	C.
Woody Vine Stratum (Plot size:)			. 00101			
1					Hydrophytic		
2					Vegetation Present? Y	∕es <u> </u>	_
% Bare Ground in Herb Stratum			= Total	l Cover			
Remarks:					1		

OIL							Sampling Point: 21
Profile Des	cription: (Describe to the	depth needed to docu	ment the	indicator	or confir	m the absence	of indicators.)
Depth	Matrix		ox Feature				
(inches)	Color (moist) %	Color (moist)	%	<u>Type¹</u>	Loc ²	Texture	Remarks
0-18+	2.5Y 3/2		_			Fine. Sa lo	Slightly moist
						·	
	·						
	. 						
						. ———	
	, <u> </u>						
	Concentration, D=Depletion, I				ed Sand G		cation: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applicable to	all LRRs, unless other	rwise not		ed Sand G	Indicato	ors for Problematic Hydric Soils ³ :
Hydric Soil Histoso	Indicators: (Applicable to	all LRRs, unless othe Sandy Redox (erwise not (S5)		ed Sand G	Indicato 2 cr	ors for Problematic Hydric Soils ³ : m Muck (A10)
Hydric Soil Histoso Histic E	Indicators: (Applicable to I (A1) pipedon (A2)	Sandy Redox (Stripped Matrix	erwise not (S5) < (S6)	ed.)		Indicate 2 cr Rec	ors for Problematic Hydric Soils ³ : m Muck (A10) d Parent Material (TF2)
Hydric Soil Histoso Histic E Black H	Indicators: (Applicable to I (A1) pipedon (A2) listic (A3)	o all LRRs, unless other Sandy Redox (Stripped Matrix Loamy Mucky	erwise not (S5) ((S6) Mineral (F	ed.)		Indicate 2 cr Rec	ors for Problematic Hydric Soils ³ : m Muck (A10)
Hydric Soil Histoso Histic E Black H Hydrog	Indicators: (Applicable to I (A1) pipedon (A2) listic (A3) en Sulfide (A4)	Sandy Redox (Stripped Matrix Loamy Mucky Loamy Gleyed	erwise not (S5) ((S6) Mineral (F Matrix (F2	ed.)		Indicate 2 cr Rec	ors for Problematic Hydric Soils ³ : m Muck (A10) d Parent Material (TF2)
Hydric Soil Histoso Histic E Black H Hydrog	Indicators: (Applicable to I (A1) pipedon (A2) listic (A3) en Sulfide (A4) d Below Dark Surface (A11)	Sandy Redox (Stripped Matrix Loamy Mucky Loamy Gleyed Depleted Matri	(S5) (S6) ((S6) Mineral (F Matrix (F2 x (F3)	ed.) 1) (excepted)		Indicate 2 cr Rec) Oth	ors for Problematic Hydric Soils ³ : m Muck (A10) d Parent Material (TF2) er (Explain in Remarks)
Hydric Soil Histoso Histic E Black H Hydrog Deplete	Indicators: (Applicable to I (A1) pipedon (A2) listic (A3) en Sulfide (A4) ed Below Dark Surface (A11) lark Surface (A12)	Sandy Redox (Stripped Matrix Loamy Mucky Loamy Gleyed Depleted Matrix Redox Dark St	erwise not (S5) ((S6) Mineral (F Matrix (F2 x (F3) urface (F6)	ed.) 1) (excepted)		Indicate 2 cr Rec) Oth	ors for Problematic Hydric Soils ³ : m Muck (A10) d Parent Material (TF2) er (Explain in Remarks) ors of hydrophytic vegetation and
Hydric Soil Histoso Histic E Black H Hydrog Deplete Thick D Sandy I	Indicators: (Applicable to I (A1) ipipedon (A2) listic (A3) en Sulfide (A4) ed Below Dark Surface (A11) itark Surface (A12) Mucky Mineral (S1)	Sandy Redox (Stripped Matrix Loamy Mucky Loamy Gleyed Depleted Matri	erwise not (S5) ((S6) Mineral (F Matrix (F2 x (F3) urface (F6) Surface (I	ed.) 1) (excepted)		Indicate 2 cr Rec) Oth Indicate wetla	ors for Problematic Hydric Soils ³ : m Muck (A10) d Parent Material (TF2) er (Explain in Remarks) ors of hydrophytic vegetation and and hydrology must be present,
Hydric Soil Histoso Histic E Black H Hydrog Deplete Thick D Sandy I Sandy (Indicators: (Applicable to I (A1) pipedon (A2) listic (A3) en Sulfide (A4) ed Below Dark Surface (A11) lark Surface (A12)	Sandy Redox (Stripped Matrix Loamy Mucky Loamy Gleyed Depleted Matri Redox Dark St	erwise not (S5) ((S6) Mineral (F Matrix (F2 x (F3) urface (F6) Surface (I	ed.) 1) (excepted)		Indicate 2 cr Rec) Oth Indicate wetla	ors for Problematic Hydric Soils ³ : m Muck (A10) d Parent Material (TF2) er (Explain in Remarks) ors of hydrophytic vegetation and
Hydric Soil Histoso Histic E Black H Hydrog Deplete Thick D Sandy I Sandy (Indicators: (Applicable to I (A1) pipedon (A2) listic (A3) en Sulfide (A4) ed Below Dark Surface (A11) ark Surface (A12) Mucky Mineral (S1) Gleyed Matrix (S4)	Sandy Redox (Stripped Matrix Loamy Mucky Loamy Gleyed Depleted Matri Redox Dark Stripped Dark Redox Depress	erwise not (S5) ((S6) Mineral (F Matrix (F2 x (F3) urface (F6) Surface (I	ed.) 1) (excepted)		Indicate 2 cr Rec) Oth Indicate wetla	ors for Problematic Hydric Soils ³ : m Muck (A10) d Parent Material (TF2) er (Explain in Remarks) ors of hydrophytic vegetation and and hydrology must be present,

HYDROLOGY				
Wetland Hydrology Indica	tors:			
Primary Indicators (minimum	n of one required; chec	ck all that apply)		Secondary Indicators (2 or more required)
Surface Water (A1)	_	Water-Stained Leaves (B9) (ex	cept MLRA	Water-Stained Leaves (B9) (MLRA 1, 2,
High Water Table (A2)		1, 2, 4A, and 4B)		4A, and 4B)
Saturation (A3)		Salt Crust (B11)		Drainage Patterns (B10)
Water Marks (B1)		Aquatic Invertebrates (B13)		Dry-Season Water Table (C2)
Sediment Deposits (B2)) _	Hydrogen Sulfide Odor (C1)		Saturation Visible on Aerial Imagery (C9)
Drift Deposits (B3)		Oxidized Rhizospheres along L	iving Roots (C3)	Geomorphic Position (D2)
Algal Mat or Crust (B4)		Presence of Reduced Iron (C4))	Shallow Aquitard (D3)
Iron Deposits (B5)	_	Recent Iron Reduction in Tilled	Soils (C6)	FAC-Neutral Test (D5)
Surface Soil Cracks (B6	s)	Stunted or Stressed Plants (D1) (LRR A)	Raised Ant Mounds (D6) (LRR A)
Inundation Visible on A	erial Imagery (B7)	Other (Explain in Remarks)		Frost-Heave Hummocks (D7)
Sparsely Vegetated Co.	ncave Surface (B8)			
Field Observations:				
Surface Water Present?	Yes No _	_ Depth (inches):	_	
Water Table Present?	Yes No	Depth (inches):	_	
Saturation Present? (includes capillary fringe)	Yes No	Depth (inches):	_ Wetland Hy	drology Present? Yes No
Describe Recorded Data (st	ream gauge, monitorin	ng well, aerial photos, previous insp	ections), if availa	ıble:
Remarks:				

Project/Site: Orcas Island Airport	(City/Cou	nty: San Juar	n County	Sampling Date	6/3/14
Applicant/Owner: Orcas Island Airport (c/o WH Pacific	c, Inc.)			State: WA	Sampling Point	_{:: 22}
				nge: S14, T37N, R2W		
Landform (hillslope, terrace, etc.): Drainageways						lone (%): 0-5
Subregion (LRR): LRR-A						
Soil Map Unit Name: Sholander-Spieden complex, 0 t						
Are climatic / hydrologic conditions on the site typical for	•			· ·	,	
Are Vegetation, Soil, or Hydrology				Normal Circumstances"		_ No
Are Vegetation, Soil, or Hydrology	_ naturally pro	blematic	:? (If ne	eded, explain any answe	rs in Remarks.)	
SUMMARY OF FINDINGS - Attach site ma	p showing	samp	ling point lo	ocations, transects	, important	features, etc.
Hudranhutia Vagatatian Dragant?	No					
Hydrophytic Vegetation Present? Yes _ ✔	No		s the Sampled			
Wetland Hydrology Present? Yes	No V	W	ithin a Wetlan	nd? Yes	No _ 🗸	
Remarks:						
VEGETATION – Use scientific names of pla	ants.					
	Absolute	Domina	ant Indicator	Dominance Test work	sheet:	
Tree Stratum (Plot size:)			s? Status	Number of Dominant S	pecies	
1. Pseudotsuga menziesii	25	<u>Y</u>		That Are OBL, FACW,	or FAC: 2	(A)
2. Crataegus douglasii	20	Υ	<u>Fac</u>	Total Number of Domir	nant	
3				Species Across All Stra	ata: <u>8</u>	(B)
4				Percent of Dominant S	pecies	
Sapling/Shrub Stratum (Plot size:)	45	_ = Total	Cover	That Are OBL, FACW,	or FAC: 20	(A/B)
1. Cytisis scoparius	10	Υ	Upl	Prevalence Index wor	ksheet:	
2. Rubus armeniucus	10	Υ	FacU	Total % Cover of:	Multi	ply by:
3. Symphoricarpus albus	10	Υ	FacU	OBL species	x 1 =	
4. Ilex aquifolium	5	N	FacU	FACW species	x 2 =	
5				FAC species	x 3 =	
	35	_= Total	Cover	FACU species	x 4 =	
Herb Stratum (Plot size:) 1 Festuca arundinacea	25	V	FacU	UPL species		
2. Dactylis glamerata	<u>25</u> 	<u>'</u>	FacU	Column Totals:	(A)	(B)
Holoup Innotus	10	<u>'</u> Y	Fac	Prevalence Index	- R/Δ -	
4				Hydrophytic Vegetation		
5				Dominance Test is		
6.				Prevalence Index i		
7				Morphological Ada	ptations ¹ (Provid	le supporting
8.					s or on a separa	te sheet)
9.				Wetland Non-Vasc		4
10				Problematic Hydro	. , .	` ' '
11				¹ Indicators of hydric so be present, unless dist	I and wetland hy	drology must
	50	_= Total (Cover	be present, unless dist	arbed or problem	idio.
Woody Vine Stratum (Plot size:)						
1				Hydrophytic Vegetation		
2					sNo	<u> </u>
% Bare Ground in Herb Stratum		_= Total (Cover			
Remarks:				l .		

SOIL		Sampling Point: 22	_
Profile Desci	ription: (Describe to the de	epth needed to document the indicator or confirm the absence of indicators.)	
Depth	Matrix	Redox Features	

Depth Matrix (inches) Color (moist) %	Color (moist)		Loc ²	<u>Texture</u>	Remarks
0-8 10YR 2/1				loam	moist
8-16+ 10YR 4/4				gr. sa. loam	moist
			·		
		·		•	
					
					
¹ Type: C=Concentration, D=Depletion, R	RM=Reduced Matrix, CS	=Covered or Coate	ed Sand Gr	ains. ² Loc	cation: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to					ors for Problematic Hydric Soils³:
Histosol (A1)	Sandy Redox (S	55)		2 cr	n Muck (A10)
Histic Epipedon (A2)	Stripped Matrix (` '			Parent Material (TF2)
Black Histic (A3)		lineral (F1) (excep	ot MLRA 1)	Oth	er (Explain in Remarks)
Hydrogen Sulfide (A4) Depleted Below Dark Surface (A11)	Loamy Gleyed N Depleted Matrix				
Thick Dark Surface (A11)	Redox Dark Sur	` '		³ Indicato	ors of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Depleted Dark S	` '			nd hydrology must be present,
Sandy Gleyed Matrix (S4)	Redox Depressi	` ,			s disturbed or problematic.
Restrictive Layer (if present):					
Type:					
Depth (inches):				Hydric Soil	Present? Yes No
Remarks:					
LIVEROL COV					
Wetland Hydrology Indicators:	ired: check all that apply	Λ		Sacon	odary Indicators (2 or more required)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requ		-	aycant MI F		ndary Indicators (2 or more required)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requ Surface Water (A1)	Water-Stair	ned Leaves (B9) (except MLF		/ater-Stained Leaves (B9) (MLRA 1, 2,
Wetland Hydrology Indicators: Primary Indicators (minimum of one requestion Surface Water (A1) High Water Table (A2)	Water-Stair 1, 2, 4A	ned Leaves (B9) (except MLF	RA W	/ater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3)	Water-Stair 1, 2, 4A Salt Crust (ned Leaves (B9) (except MLF	RA W	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rrainage Patterns (B10)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requestion Surface Water (A1) High Water Table (A2)	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv	ned Leaves (B9) (6 , and 4B) (B11)	except MLF	RA W D D	/ater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requestions Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S	ned Leaves (B9) (6, and 4B) (B11) ertebrates (B13) Sulfide Odor (C1)		RA W D D S	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Trainage Patterns (B10) Try-Season Water Table (C2)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requestion Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R	ned Leaves (B9) (6, and 4B) (B11) ertebrates (B13) Sulfide Odor (C1)	J Living Roo	RA W D D S ts (C3) G	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) vrainage Patterns (B10) vry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence o	ned Leaves (B9) (6, and 4B) (B11) ertebrates (B13) Sulfide Odor (C1) hizospheres along	J Living Roo (4)	RA W D D S sts (C3) G	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) Irainage Patterns (B10) Iry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) Recomorphic Position (D2)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	Water-Stain 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence o	ned Leaves (B9) (c, and 4B) (B11) ertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C	y Living Roo 4) ed Soils (C6	RA W D S ats (C3) G S	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rrainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) teomorphic Position (D2) hallow Aquitard (D3)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requestion Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery	— Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) — Other (Expl	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C	y Living Roo 4) ed Soils (C6	RA W D S S ts (C3) G S S	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) recomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requestion Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6)	— Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) — Other (Expl	ned Leaves (B9) (6, and 4B) (B11) ertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (E	y Living Roo 4) ed Soils (C6	RA W D S S ts (C3) G S S	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) teomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations:	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence o Recent Iror Stunted or (B7) Other (Exple)	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (E lain in Remarks)	J Living Roo (4) ed Soils (C6 (1) (LRR A)	RA W D S S ts (C3) G S S	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) teomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
Primary Indicators (minimum of one requestions) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Yes	— Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence o Recent Iror Stunted or (B7) — Other (Expl	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (E lain in Remarks)	J Living Roo (4) ed Soils (C6 (D1) (LRR A)	RA W D S S ts (C3) G S S	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) teomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requisions) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Yes Water Table Present? Yes	— Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence o Recent Iror Stunted or (B7) Other (Expl e (B8) No ✓ Depth (inc No ✓ Depth (inc	ned Leaves (B9) (6, and 4B) (B11) ertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (E lain in Remarks)	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S ts (C3) S S) F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) decomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requisions) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes	— Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence o Recent Iror Stunted or (B7) — Other (Expl	ned Leaves (B9) (6, and 4B) (B11) ertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (E lain in Remarks)	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S ts (C3) S S) F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) teomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requisions) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes (includes capillary fringe)	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) Other (Expl e (B8) No _ ✓ _ Depth (inc No _ ✓ Depth (inc	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (D lain in Remarks) Thes): Thes):	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S tts (C3) G S S F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) decomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requisions) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) Other (Expl e (B8) No _ ✓ _ Depth (inc No _ ✓ Depth (inc	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (D lain in Remarks) Thes): Thes):	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S tts (C3) G S S F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) decomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requised Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes Saturation Present? Yes [includes capillary fringe)	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) Other (Expl e (B8) No _ ✓ _ Depth (inc No _ ✓ Depth (inc	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (D lain in Remarks) Thes): Thes):	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S tts (C3) G S S F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) decomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requisited Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge,	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) Other (Expl e (B8) No _ ✓ _ Depth (inc No _ ✓ Depth (inc	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (D lain in Remarks) Thes): Thes):	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S tts (C3) G S S F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) decomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requisited Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge,	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) Other (Expl e (B8) No _ ✓ _ Depth (inc No _ ✓ Depth (inc	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (D lain in Remarks) Thes): Thes):	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S tts (C3) G S S F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) decomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
Wetland Hydrology Indicators: Primary Indicators (minimum of one requisited Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface Field Observations: Surface Water Present? Yes Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge,	Water-Stair 1, 2, 4A Salt Crust (Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iror Stunted or (B7) Other (Expl e (B8) No _ ✓ _ Depth (inc No _ ✓ Depth (inc	ned Leaves (B9) (6, and 4B) (B11) Pertebrates (B13) Sulfide Odor (C1) hizospheres along of Reduced Iron (C n Reduction in Tille Stressed Plants (D lain in Remarks) Thes): Thes):	J Living Roo (4) ed Soils (C6 01) (LRR A)	RA W D S tts (C3) G S S F	Vater-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) decomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)

Project/Site: Orcas Island Airport	(City/County	_{y:} <u>San Juar</u>	n County	Sampling Date	e: 6/3/14
Applicant/Owner: Orcas Island Airport (c/o WH Pacific				State: WA	Sampling Poir	nt: <u>23</u>
Investigator(s): A. Bachman		Section, To	ownship, Ra	nge: S14, T37N, R2W		
				convex, none): Concave	;	Slope (%): <u>0-5</u>
Subregion (LRR): LRR-A	Lat: 48°	42'17.96" N	N	Long: 122°54'33.06"W	<u>'</u> D;	atum:
Soil Map Unit Name: Sholander-Spieden complex, 0 to				NWI classification		
Are climatic / hydrologic conditions on the site typical for t	his time of ve					
Are Vegetation, Soil, or Hydrology	-			"Normal Circumstances" p		✓ No
Are Vegetation, Soil, or Hydrology				eeded, explain any answer		
SUMMARY OF FINDINGS – Attach site map						
Hydrophytic Vegetation Present? Yes _ 🗸 _	No					
Hydric Soil Present? Yes _ 🗸			he Sampled hin a Wetlar		No	
Wetland Hydrology Present? Yes	No	Witi	nın a vvetiar	id? fes	NO	
Remarks:						
VEGETATION – Use scientific names of pla	ınts.					
Trop Stratum (Plot cizo:	Absolute		t Indicator	Dominance Test works		
Tree Stratum (Plot size:) 1. Alnus rubra	30	Y Y	Status Fac	Number of Dominant Sp That Are OBL, FACW, of		(A)
2. Crataegus douglasii	10	Υ	Fac			(A)
3.				Total Number of Domina Species Across All Strat	ant _{ta} . 5	(B)
4.				·		(5)
	40	= Total Co	over	Percent of Dominant Sp That Are OBL, FACW, of	ecies or FAC: 80	(A/B)
Sapling/Shrub Stratum (Plot size:)	_					(100)
1. Rubus armeniucus	5	Y	FacU	Prevalence Index work		
2				Total % Cover of:		
3				OBL species		
4				FACW species FAC species		
5		= Total Co	0.401	FACU species		
Herb Stratum (Plot size:)		_= Total Ct	ovei	UPL species		
1. Equicetum arvense	30	Υ	Fac	Column Totals:		
2. Carex obnupta	15	<u>Y</u>	Obl			
3. Agrostis gigantia	10	N	Fac	Prevalence Index		
4. Juncus effusus	10	N	FacW	Hydrophytic Vegetatio		
5				Dominance Test is		
6				Prevalence Index is Morphological Adap		ido ourrontina
7				data in Remarks	or on a separ	ate sheet)
8				Wetland Non-Vascu	ular Plants ¹	
9 10				Problematic Hydrop	ohytic Vegetation	on¹ (Explain)
11.				¹ Indicators of hydric soil		
		= Total Co	over	be present, unless distu	rbed or problei	matic.
Woody Vine Stratum (Plot size:)	•	_ 1014100	,,,,,			
1				Hydrophytic		
2				Vegetation Yes	s_ / _ No	
% Bare Ground in Horb Stratum	-	= Total Co	over			
% Bare Ground in Herb Stratum						

SOIL Sampling Point: 23

Depth	Matrix	•	tn needed to docur Redo	x Features			iie abselice	or maioators.j
(inches)	Color (moist)	%	Color (moist)	<u>%</u> T	ype ¹ Lo	oc ²	Texture	Remarks
0-18+	10YR 2/1		10YR 4/4	5			oam	moist
	-			· 				
	-			· —— —				
								
				- — —				
-	·							
¹Type: C=Co	oncentration, D=D	epletion, RM:	=Reduced Matrix, CS	S=Covered or	Coated Sa	nd Grai	ns. ² Loc	eation: PL=Pore Lining, M=Matrix.
			LRRs, unless other					rs for Problematic Hydric Soils ³ :
Histosol	(A1)		Sandy Redox (S5)			2 cm	n Muck (A10)
Histic Ep	ipedon (A2)		Stripped Matrix	(S6)			Red	Parent Material (TF2)
Black His	. ,		Loamy Mucky N		except MLF	RA 1)	Othe	er (Explain in Remarks)
	n Sulfide (A4)		Loamy Gleyed					
	Below Dark Sur	face (A11)	Depleted Matrix	` '			3, ,, ,	
	ark Surface (A12)	`	✓ Redox Dark Su	` ,				rs of hydrophytic vegetation and
	lucky Mineral (S1 leyed Matrix (S4)		Depleted Dark Redox Depress	, ,				nd hydrology must be present, s disturbed or problematic.
	ayer (if present		Tredex Depress	10110 (1 0)			dilico	distarbed of problematic.
Type:	, ,	•						
,. <u> </u>	ches):		<u> </u>				Hydric Soil	Present? Yes V No
Remarks:							,	
]								
HYDROLO(
•	drology Indicato		di abaak all that anal				Casan	adom, la diseatore (2 er more required)
		or one required	d; check all that appl	•	(DO) (ndary Indicators (2 or more required)
	Water (A1)			ined Leaves ((B9) (excep	Ot MLKA	<u> </u>	/ater-Stained Leaves (B9) (MLRA 1, 2,
_	ter Table (A2)			A, and 4B)			_	4A, and 4B)
Saturation	, ,		Salt Crust	` '	240)			rainage Patterns (B10)
<u>✓</u> Water M			•	vertebrates (E	•			ry-Season Water Table (C2)
	t Deposits (B2)			Sulfide Odor	. ,	- D t -		aturation Visible on Aerial Imagery (C9)
	osits (B3)			•		g Roots	` , —	eomorphic Position (D2)
•	t or Crust (B4)			of Reduced Ir In Reduction i	` '	ila (CC)		hallow Aquitard (D3) AC-Neutral Test (D5)
	osits (B5) Soil Cracks (B6)			Stressed Pla		` ,		aised Ant Mounds (D6) (LRR A)
	on Visible on Aeri	al Imagany (P		olain in Rema		KK A)		rost-Heave Hummocks (D7)
	Vegetated Conc			nam in Kema	iks)		, []	ost-Heave Hullillocks (D1)
Field Observ			20)					
Surface Water		Yes	No Depth (in	ches).				
Water Table			No Depth (in					
Saturation Pr		· · · · · · · · · · · · · · · · · · ·	No Depth (in	,		Wotlan	d Hydrology	/ Present? Yes V No No
(includes cap		162	No Depth (in	cries)		wellall	u nyurology	y riesent: Tes NO
		am gauge, mo	onitoring well, aerial	photos, previo	ous inspecti	ions), if	available:	
Remarks:								

Project/Site: Orcas Island Airport	(City/Coun	_{ty:} San Juar	County	Sampling	Date: 6/3/14	
Applicant/Owner: Orcas Island Airport (c/o WH Pacific, In				State: WA	Sampling	Point: 24	
Investigator(s): A. Bachman		Section, T	ownship, Rai	nge: S14, T37N, R2W			
				convex, none): Concave		Slope (%):	0-5
Subregion (LRR): LRR-A			•				
Soil Map Unit Name: Sholander-Spieden complex, 0 to 5				NWI classific			
Are climatic / hydrologic conditions on the site typical for this							
Are Vegetation, Soil, or Hydrologysi	-			Normal Circumstances" p		/00 / NI	•
							·
Are Vegetation, Soil, or Hydrology na				eded, explain any answei			
SUMMARY OF FINDINGS – Attach site map s	showing	sampli	ng point le	ocations, transects	, importa	ant feature	s, etc.
Hydrophytic Vegetation Present? Yes _ V _ No) _	lo i	tha Camplad	Aron			
Hydric Soil Present? Yes _ ✔ _ No)_ <u> </u>		the Sampled thin a Wetlan	4	No		
Wetland Hydrology Present? Yes _ V _ No)	W 11	ullil a Wetlal	iu: 165	110_		
Remarks:							
VEGETATION – Use scientific names of plant	s.						
Tree Stretum (Diet einer	Absolute		nt Indicator	Dominance Test works	sheet:		
Tree Stratum (Plot size:) 1			? Status	Number of Dominant Sp That Are OBL, FACW, o	pecies or FAC:	2	(A)
2				Total Number of Domina		•	
3				Species Across All Stra	ta: _	2	(B)
4			Cover	Percent of Dominant Sp That Are OBL, FACW, o		100	(A/B)
Sapling/Shrub Stratum (Plot size:)				Prevalence Index work	kshoot.		
1				Total % Cover of:		Multiply by:	
3				OBL species			
4.				FACW species			
5				FAC species	x 3	=	_
			Cover	FACU species	x 4	=	_
Herb Stratum (Plot size:)	00	V	5 >4/	UPL species	x 5	=	_
1. Juncus acuminatus		<u>Y</u> Y	FacW	Column Totals:	(A)		_ (B)
2. Alopocurus pratensis 3. Agrostis gigantia	25 15	N	FacW Fac	Dravalance Index	D/A		
Agrostis gigantia Juncus effusus	10	N	FacW	Prevalence Index Hydrophytic Vegetation			_
5. Carex obnupta	10	N	Obl	Dominance Test is		л 5 .	
6. Holcus lanatus	10	N	Fac	Prevalence Index is			
3··				Morphological Adag		Provide suppor	tina
7 8			_	data in Remarks	or on a se	eparate sheet)	9
9.				Wetland Non-Vascu			
10				Problematic Hydrop	ohytic Vege	etation ¹ (Explai	in)
11.				¹ Indicators of hydric soil			nust
	100	= Total C	over	be present, unless distu	rbea or pro	obiematic.	
Woody Vine Stratum (Plot size:)							
1				Hydrophytic			
2				Vegetation Present? Yes	s /	No	
0/ Para Cround in Hort Stratum		= Total C	over	100	· 	<u>-</u>	
% Bare Ground in Herb Stratum							
Tromand.							

SOIL

Sampling Point: 24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

9" M=Matrix. ric Soils³:
⁄/⊫Matrix. ric Soils³:
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) (MLRA 1, 2,
C2)
C2) I Imagery (C9)
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,
I Imagery (C9)
LRR A)
e re

Project/Site: Orcas Island Airport	(City/Cour	_{nty:} San Juar	n County	Sampling	Date: 6/3/14	4
Applicant/Owner: Orcas Island Airport (c/o WH Pac				State: WA	Sampling	Point: 25	
Investigator(s): A. Bachman		Section,	Township, Ra	nge: S14, T37N, R2W			
Landform (hillslope, terrace, etc.): Drainageways				convex, none): Concave		Slope (%): <u>0-5</u>
	Lat: 48°	42'17.96	"N	Long: 122°54'33.06"V	V	_ Datum:	
Soil Map Unit Name: Sholander-Spieden complex,				NWI classific			
Are climatic / hydrologic conditions on the site typical	for this time of yea						
Are Vegetation, Soil, or Hydrology _	-			"Normal Circumstances"		res 🗸	No
Are Vegetation, Soil, or Hydrology				eeded, explain any answe			
SUMMARY OF FINDINGS – Attach site r							es, etc.
Hydrophytic Vegetation Present? Yes _ 🗸	No		4				
Hydric Soil Present? Yes _ 🗸	No		the Sampled ithin a Wetlar		, No		
Wetland Hydrology Present? Yes _ 🗸	No	W	illiili a vveliai	iur res	NO_		
Remarks:							
$\label{lem:VEGETATION-Use scientific names of} \textbf{VEGETATION-Use scientific names of} \\$	plants.						
Total Obstanta (District	Absolute		nt Indicator	Dominance Test work	sheet:		
Tree Stratum (Plot size:) 1. Alnus rubra	<u>% Cover</u> 30	Y	S? Status Fac	Number of Dominant S	pecies	3	(4)
2. Crataegus douglasii	25	Y	Fac	That Are OBL, FACW,	or FAC: _		_ (A)
3				Total Number of Domir	nant	3	(D)
4.				Species Across All Stra	ııa. <u>'</u>		_ (B)
7.	55	= Total (Cover	Percent of Dominant S		100	(A /D)
Sapling/Shrub Stratum (Plot size:)		_ = 10tar (OOVOI	That Are OBL, FACW,	or FAC: _	100	_ (A/B)
1. Rosa nutkana	35	<u>Y</u>	Fac	Prevalence Index wor	ksheet:		
2. Rubus armeniucus	10	N	FacU	Total % Cover of:		Multiply by:	
3. Rubus laciniatus	5	N	FacU	OBL species			
4				FACW species			
5				FAC species			
Herb Stratum (Plot size:)	50	_= Total (Cover	FACU species			
1. Carex obnupta	60	Υ	Obl	UPL species			
2.				Column Totals:	(A)		(B)
3.				Prevalence Index	= B/A = _		
4.				Hydrophytic Vegetation	on Indicato	ors:	
5				Dominance Test is	>50%		
6				Prevalence Index i	s ≤3.0 ¹		
7				Morphological Ada data in Remark			
8				Wetland Non-Vaso		•	ι)
9				Problematic Hydro			lain)
10		-		¹ Indicators of hydric so			
11				be present, unless dist			must
Woody Vine Stratum (Plot size:)	-	= Total C	Cover				
1				Hydrophytic			
2				Vegetation			
				Present? Ye	s	No	
% Bare Ground in Herb Stratum							
Remarks:					·		

SOIL

Sampling Point: 25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix			x Feature	S 1 · · · 2		5
(inches)	Color (moist)	%	Color (moist)	<u>%</u> 5	Type ¹ Loc ²		Remarks
0-16	10YR 3/1		10YR 3/3	5		sandy loam	saturated
16-20+	10YR 5/2		10YR 4/4	50		sandy loam	saturated
-							
							
					·	<u> </u>	
¹ Type: C=C	oncentration, D=Deple	etion, RM=	Reduced Matrix, C	S=Covere	d or Coated Sand	d Grains. ² Lo	ocation: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applica	ble to all L	RRs, unless othe	rwise not	ed.)	Indicate	ors for Problematic Hydric Soils ³ :
Histosol	` '		Sandy Redox (S5)			m Muck (A10)
	oipedon (A2)	,	Stripped Matrix	` '			d Parent Material (TF2)
	istic (A3)				1) (except MLRA	1) Oth	ner (Explain in Remarks)
	en Sulfide (A4)	(044)	Loamy Gleyed		2)		
	d Below Dark Surface ark Surface (A12)	(A11)	Depleted Matri: Redox Dark Su	` ,		³ Indicat	ors of hydrophytic vegetation and
	Mucky Mineral (S1)		✓ Depleted Dark	, ,			and hydrology must be present,
-	Gleyed Matrix (S4)	,	Redox Depress		.,		ss disturbed or problematic.
	Layer (if present):		•	· /			
Type:							
Depth (in	ches):					Hydric Soi	I Present? Yes V No No
Remarks:							
HYDROLO	GY						
Wetland Hy	drology Indicators:						
Primary India	cators (minimum of on	e required	; check all that app	ly)		<u>Seco</u>	ondary Indicators (2 or more required)
Surface	Water (A1)		Water-Sta	ined Leav	es (B9) (except l	VILRA \	Water-Stained Leaves (B9) (MLRA 1, 2,
High Wa	ater Table (A2)		1, 2, 4	A, and 4B)		4A, and 4B)
✓ Saturation	on (A3)		Salt Crust	(B11)			Drainage Patterns (B10)
Water M	larks (B1)		Aquatic In	vertebrate	es (B13)		Dry-Season Water Table (C2)
Sedime	nt Deposits (B2)		Hydrogen	Sulfide O	dor (C1)	8	Saturation Visible on Aerial Imagery (C9)
Drift De	posits (B3)		Oxidized I	Rhizosphe	eres along Living I	Roots (C3) (Geomorphic Position (D2)
Algal Ma	at or Crust (B4)		Presence	of Reduce	ed Iron (C4)	\$	Shallow Aquitard (D3)
Iron Dep	oosits (B5)		Recent Iro	on Reducti	on in Tilled Soils	(C6) F	FAC-Neutral Test (D5)
	Soil Cracks (B6)			r Stressed	Plants (D1) (LRF	R A) F	Raised Ant Mounds (D6) (LRR A)
	on Visible on Aerial In	0 , (, `	plain in Re	emarks)	_. F	Frost-Heave Hummocks (D7)
	y Vegetated Concave	Surface (B	8)				
Field Obser			_				
Surface Wat			lo Depth (in				
Water Table			lo Depth (in				
Saturation P		s N	lo Depth (in	ches): <u>0"</u>	w	etland Hydrolog	gy Present? Yes 🗸 No
	oillary fringe) corded Data (stream ç	gauge, moi	nitoring well aerial	photos pr	evious inspection	ns), if available	
2000100110	- 1. aua Daia (oli odili (,go, 11101		F5100, PI	2223	,, aranabio.	
Remarks:							
Montains.							

Project/Site: Orcas Island Airport		(City/Co	ounty:	San Juar	n County	s	ampling	Date:	6/3/14	
Applicant/Owner: Orcas Island Airp	ort (c/o WH Pacifi	ic, Inc.)				State	: <u>WA</u> S	ampling	Point:	26	
Investigator(s): A. Bachman			Section	n, Tow	nship, Ra	nge: S14, T	37N, R2W				
Landform (hillslope, terrace, etc.): Dr							e): Concave		Slo	pe (%): <u>0</u>)-5
		Lat: 48°	42'17.9	96"N		Long: 122	2°54'33.06"W		Datu	m:	
Soil Map Unit Name: Sholander-Spi							NWI classificati				
Are climatic / hydrologic conditions or	n the site typical for	r this time of ye	ar? Ye								
Are Vegetation, Soil,		-					umstances" pre		Yes •	/ No	
Are Vegetation, Soil,							n any answers				
SUMMARY OF FINDINGS –	-									atures,	, etc.
Hydrophytic Vegetation Present?	Yes	No 🗸		la tha	. Cammia d						
Hydric Soil Present?	Yes	No 🗸			e Sampled n a Wetlar		Yes	No	~		
Wetland Hydrology Present?	Yes	No _ 🗸		WILLIII	ii a vvetiai	iu:	163	_ 140 _		-	
Remarks:											
VEGETATION – Use scientif	ic names of p	lants.									
T 0: (D) :	`	Absolute			Indicator	Dominano	e Test worksh	eet:			
<u>Tree Stratum</u> (Plot size:)	<u>% Cover</u> 80	Spec Y		FacU		Dominant Spec		2	((A)
2. Crataegus douglasii		10	N		Fac	That Are C	DBL, FACW, or	FAC:	=	(/	Α)
3.							ber of Dominan cross All Strata:		2	ľ	(B)
4.					_			-		(,0)
		90	= Tota	al Cov	er		Dominant Spec DBL, FACW, or		0	(,	(A/B)
Sapling/Shrub Stratum (Plot size: _)									(/	,,,,,,
1. Rubus armeniucus		20	<u>Y</u>		FacU		e Index works				
2							% Cover of:				
3						1	es				
4						1	ecies				
5				-1.0		1	es				
Herb Stratum (Plot size:)	20	_= 10ta	ai Cov	er		cies es				
1	, ,						otals:				
2.						Column	nais	(^)			(D)
3.						Preva	alence Index =	$B/A = $ _			
4						Hydrophy	tic Vegetation	Indicate	ors:		
5						Domin	nance Test is >5	50%			
6							lence Index is ≤				
7							ological Adapta a in Remarks o				ng
8							a in Remarks on nd Non-Vascula		•	sneet)	
9							ematic Hydrophy			(Evolain)	١
10							of hydric soil a			, , ,	
11							, unless disturb				151
Woody Vine Stratum (Plot size:	,		_= Tota	al Cove	er						
1						Hydrophy	tic				
2.						Vegetation	n			,	
			= Tota			Present?	Yes_		No	<u> </u>	
% Bare Ground in Herb Stratum					- 						
Remarks:											

SOIL Sampling Point: 26

Profile Des	cription: (Descri	be to the dep	th needed	to docun	nent the i	ndicator	or confirm	n the absence	of indicator	·s.)	
Depth	Matrix				x Feature:	S		_		_	
(inches)	Color (moist)	%	Color (n	noist)	<u>%</u>	_Type ¹	Loc ²	<u>Texture</u>		Remarks	
0-8	10YR 3/2							sa. loam	sl. moist		
8-16+	10YR 3/3							sa. loam	sl. moist		
							,				
								-			
	-							·			
								-	-		
1- 0.0								. 21	·		
	oncentration, D=D Indicators: (App						ed Sand Gr		cation: PL=P ors for Problem		_
_		licable to all				ea.)				-	ic sons :
Histoso	r (A1) pipedon (A2)		-	Redox (Sed Matrix					m Muck (A10) d Parent Mate		
	istic (A3)				` '	I) (excent	MLRA 1)		er (Explain in	` ,	
	en Sulfide (A4)			-	Matrix (F2		·,		ioi (Expiaiii iii	rromanoj	
	d Below Dark Surf	ace (A11)	-	ed Matrix		,					
Thick D	ark Surface (A12)	, ,	Redox	Dark Sui	rface (F6)			³ Indicate	ors of hydropl	hytic vegetati	on and
Sandy M	Mucky Mineral (S1)	Deplet	ed Dark S	Surface (F	7)		wetla	and hydrology	must be pre	sent,
	Gleyed Matrix (S4)		Redox	Depress	ions (F8)			unles	ss disturbed o	or problemation).
Restrictive	Layer (if present)):									
Type:											
Depth (in	iches):							Hydric Soi	I Present?	Yes	No
HYDROLO)GY										
Wetland Hy	drology Indicato	rs:									
Primary Indi	cators (minimum o	of one required	d; check all	that apply	y)			Seco	ndary Indicate	ors (2 or more	<u>e required)</u>
Surface	Water (A1)		W	/ater-Stai	ned Leav	es (B9) (e	xcept MLF	RA V	Vater-Stained	d Leaves (B9)	(MLRA 1, 2,
High Wa	ater Table (A2)			1, 2, 44	, and 4B))			4A, and 4E	3)	
Saturati	ion (A3)		S	alt Crust	(B11)			[Orainage Patte	erns (B10)	
Water N	/larks (B1)		Α	quatic Inv	ertebrate/	s (B13)		[Ory-Season W	Vater Table (C	C2)
Sedime	nt Deposits (B2)		н	ydrogen	Sulfide O	dor (C1)		8	Saturation Vis	ible on Aerial	Imagery (C9)
Drift De	posits (B3)		0	xidized R	Rhizosphe	res along	Living Roo	ots (C3) C	Geomorphic P	Position (D2)	
Algal M	at or Crust (B4)		Р	resence (of Reduce	d Iron (C	4)	s	Shallow Aquita	ard (D3)	
Iron De	posits (B5)		R	ecent Iro	n Reducti	on in Tille	d Soils (C6	6) F	AC-Neutral T	Test (D5)	
	Soil Cracks (B6)					•	1) (LRR A	•	Raised Ant Mo	, , ,	•
	ion Visible on Aeri			ther (Exp	lain in Re	marks)		, F	rost-Heave F	Hummocks (D	7)
	y Vegetated Conc	ave Surface (I	B8)								
Field Obser											
Surface Wat	ter Present?	Yes I	No _ 🗸 _ [Depth (ind	ches):						
Water Table	Present?	Yes I	No _ 🗸 _ [Depth (ind	ches):		_				
Saturation Present? Yes No _v _ Depth (inches): Wetland Hydrology Present? Yes No _v _											
(includes capillary fringe)											
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:											
Remarks:											

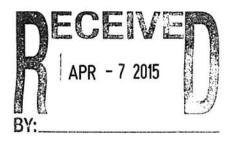
Appendix D Cultural Resources Report and SHPO Concurrence

Allyson Brooks Ph.D., Director State Historic Preservation Officer



March 30, 2015

Ms. Cayla Morgan Federal Aviation Administration 1601 Lind Avenue, SW Suite 250 Renton, WA 98057



In future correspondence please refer to:

Loa:

033015-09-FAA

Property: Proposed Improvements to Orcas Island Airport

Re:

No Historic Properties

Dear Ms. Morgan:

Thank you for contacting our office and providing a copy of the cultural resources survey report completed by ICF International. I concur with their professional recommendations and your finding of no historic properties affected for the project.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800.

Should additional information become available, our assessment may be revised. In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and this office and the concerned tribes notified.

Thank you for the opportunity to review and comment. If you have any questions, please contact me.

Sincerely,

Matthew Sterner, M.A.

Transportation Archaeologist

(360) 586-3082

matthew.sterner@dahp.wa.gov

CULTURAL RESOURCES REPORT COVER SHEET

J.T. Elder, P. Reed, and S. Sparks Author: Title of Report: Cultural Resources Survey for the Orcas Island Airport Improvement **Project** Date of Report: February 2015 County(ies): King Township: 37 N, Range: 2 W, Section: 11 Quad: Eastsound, WA (1978) 1:24,000 Acres: 58 PDF of report submitted (REQUIRED) X Yes Historic Property Export Files submitted? ☐ 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 # \bowtie No DAHP Archaeological Site #: NA

CULTURAL RESOURCES SURVEY FOR THE ORCAS ISLAND AIRPORT IMPROVEMENT PROJECT

PREPARED FOR:

WHPacific, Inc. 12100 NE 195th Street, Suite 300 Bothell, WA 98011 Contact: Flannan Tam, PM, PMP 425.951.4872

PREPARED BY:

J. Tait Elder, Patrick Reed and Shane Sparks 710 Second Avenue, Suite 550 Seattle, WA 98104 Contact: Shane Sparks 206.351.6375

February 2015



Elder, J.T..P. Reed and S. Sparks 2014. Cultural Resources Survey for the Orcas Island Airport Improvement Project. February. (ICF 00607.13.) Seattle, WA. Prepared for WHPacific, Inc. Bothell, WA.

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Appendix A Photos

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Tables and Figures

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defined.	
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defined.	
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Table

Acronyms and Abbreviations

AP auger probe

APE Area of Potential Effects

BP before present

CFR Code of Federal Regulations

DAHP Department of Archaeology and Historic Preservation

FAA Federal Aviation Administration

ICF ICF International

LiDAR Light Detecting and Ranging
MOA Memorandum of Agreement
NEPA National Environmental Policy Act
NHPA National Historic Preservation Act
NRHP National Register of Historic Places

Port Port of Orcas

RCW Revised Code of Washington

SEPA Washington State Environmental Policy Act

SHPO State Historic Preservation Officer

SP shovel probe U.S.C. United States Code

UDC Unified Development Code
USACE U.S. Army Corps of Engineers
WAC Washington Administrative Code
WHR Washington Heritage Register

WISAARD Washington Information System for Architectural and Archaeological Records Database

The Port of Orcas (Port) proposes improvements to the Orcas Island airport (the project). The project was originally initiated in 2009 to provide an asphalt overlay of both the runway and the taxiway. After completing an initial analysis, it was determined that the existing runway and taxiway pavements did not meet current Federal Aviation Administration (FAA) requirements for surface gradients, the existing pavement section was deficient in providing the required frost protection, and that both the runway and taxiway safety areas do not meet the required surface gradient standards. Following a runway analysis to evaluate the merits of completing a variable lift asphalt overlay on the runway versus completing a full pavement reconstruction, both the Port and FAA agreed to a full pavement reconstruction.

The current project would include the following project elements:

- Reconstruction of the full length of runway 16-34 (3,060 feet by 60 feet), including runway overruns at both runway ends.
- Relocation of the parallel taxiway to the east of its current location to a Runway/Taxiway centerline separation of 156 feet.
- Reconstruction of the four connector taxiways (approximately 100 feet by 25 feet with fillets).
- Relocation and replacement of the existing taxiway lighting system to match with the relocated taxiway and adjustments to the connector taxiways.
- Filling and grading of the runway and taxiway safety areas to meet current FAA grade requirements based on FAA Group I requirements.
- Adjustment of the existing signing system, Port-owned Precision Approach Path Indicator, FAA-owned Visual Approach Slope Indicator, and Port-owned Runway End Identifier Lights to grade due to the elevation changes from the safety area grading efforts.
- Installation of a new subsurface drainage system for the runway, parallel taxiway, and connector taxiways proposed for reconstruction as part of this project. These would tie into both the new and existing storm drainage systems.
- Upgrading of the stormwater conveyance system on the eastern side of the airport through the installation of a new system of pipes and catch basins from the northern side of Mt Baker Road to the upstream outfall from the Port's property to Brandt's Landing Marina.
- Relocation of the two existing aircraft gates and the existing fencing to the Port's property line adjacent to the Grio property. Completion of necessary grading to accommodate the new fence and gates in this location.
- Off-site clearing of approximately 3 acres of tree covered areas, clearing of understory vegetation and wetland mitigation.

WHPacific, Inc. Chapter 1. Introduction

The project would receive funding from FAA and permits from the U.S. Army Corps of Engineers (USACE). Thus, the project is considered a federal undertaking and would require compliance with Section 106 of the National Historic Preservation Act (NHPA). FAA would serve as the lead federal agency for the project. The purpose of the cultural resources survey presented in this report was to identify and document cultural resources within the Area of Potential Effects (APE). This technical report describes the methods and results of the cultural resources investigations and provides technical recommendations.

1.1 Project Background

Area of Potential Effects

The project would occur within tax parcels 271131001000 and 271142023000, 271412009000, 271412010000, 271412013000, on Orcas Island, Washington (Township 37 North, Range 2 West, Section 11) (Figures 1-1 and 1-2). It is anticipated that the project would result in minimal changes in setting and any construction-related indirect effects (e.g., dust, noise, light) would be minor and temporary. As a result, indirect effects to historic properties are not anticipated. The horizontal extent of the proposed APE would encompass the project's construction footprint. The vertical extent of the proposed APE would be defined as the depth of ground-disturbing activities, which would vary across the proposed APE.

Tribal Consultation

All consultation with affected tribes would be performed by FAA, as the lead federal agency for the project.

Personnel

J. Tait Elder, MA, archaeologist, served as principal investigator and report author, and performed archaeological field investigations. Patrick Reed, BA, archaeologist, performed field investigations and was the report co-author.

1.2 Regulatory Background

Federal, state, and local regulations recognize the public's interest in cultural resources and the public benefit of preserving them. These laws and regulations require analysts to consider how a project might affect significant cultural resources and to take steps to avoid or reduce potential damage. A cultural resource can be considered as any property valued (monetarily, aesthetically, or religiously) by a group of people; valued properties can be historic in character or date to the prehistoric past (i.e., the time prior to written records).

The project would receive funding from FAA and permits from USACE. As such, the project must be conducted in compliance with Section 106 of the NHPA. The project may also require applicable state permits and must meet minimum standards for cultural resources investigations as managed under the Washington State Environmental Policy Act (SEPA). This document has been prepared to

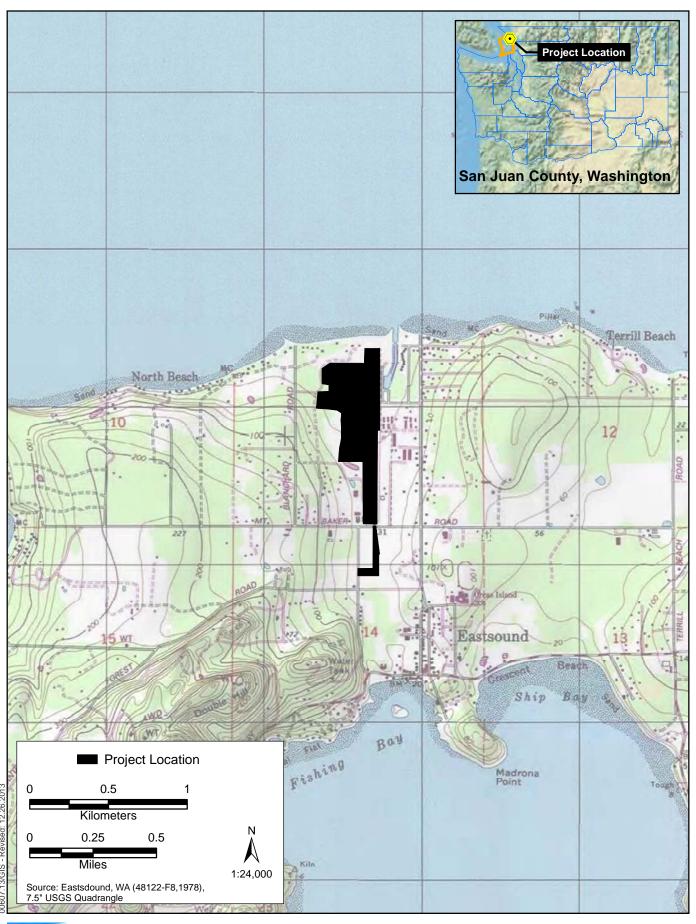




Figure 1-1
Project Location
Orcas Island Airport Improvements Project

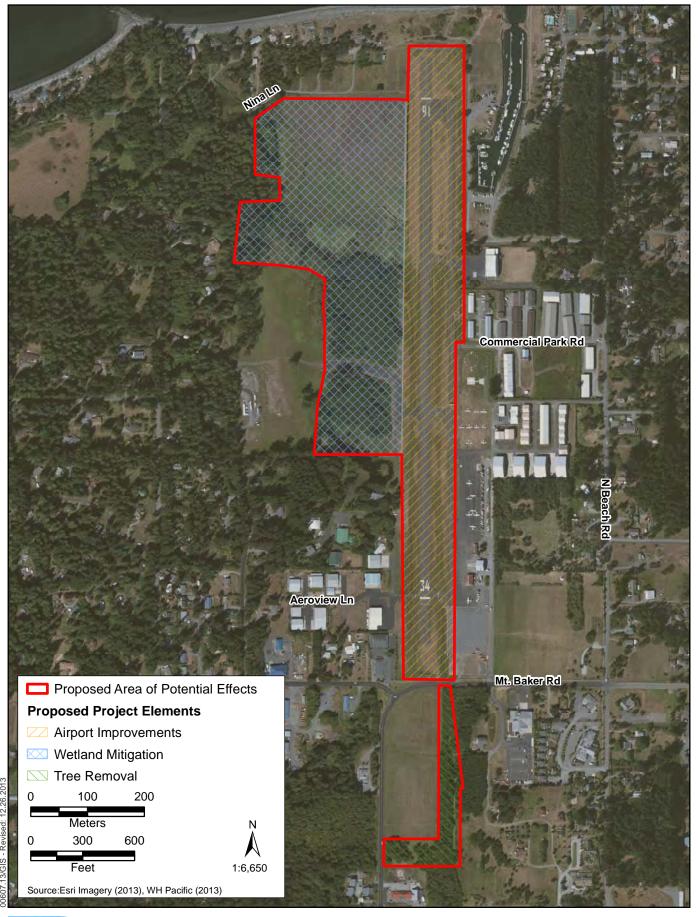




Figure 1-2
Proposed Area of Potential Effects and Project Work Areas
Orcas Island Airport Improvements Project

WHPacific, Inc. Chapter 1. Introduction

satisfy both federal and state cultural resources requirements. The following are the key applicable federal, state, and local laws and regulations.

Federal

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires the federal government to carry out its plans and programs in such a way as to preserve important historic, cultural, and natural aspects of national heritage by considering, among other things, unique characteristics of the geographic area such as proximity to historic or cultural resources (40 Code of Federal Regulations [CFR] 1508.27(b)(3)) and the degree to which an action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP) (40 CFR 1508.27(b)(8)). The implementing regulations of NEPA (40 CFR 1502.25) state that, to the fullest extent possible, "agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by the National Historic Preservation Act of 1966 (16 United States Code [U.S.C.] 470 et seq.)." Although the NEPA statute and implementing regulations do not contain detailed information concerning cultural resource impact analyses, Section 106 of the NHPA, with which NEPA must be coordinated, details standards and processes for such analyses.

Section 106 of the National Historic Preservation Act

As a federal undertaking, the project must be conducted in compliance with Section 106 of the NHPA. Section 106 requires federal agencies to consider the effects of funded or approved undertakings that have the potential to affect any district, site, building, structure, or object that is listed in or eligible for listing in the NRHP. Under Section 106, the lead federal agency must provide an opportunity for the State Historic Preservation Officer (SHPO), affected tribes, and other stakeholders to comment. The Section 106 process is codified in 36 CFR 800 and consists of five basic steps:

- 1. Initiate the process by coordinating with other environmental reviews, consulting with the SHPO, identifying and consulting with interested parties, and identifying points in the process to seek input from the public and to notify the public of proposed actions.
- 2. Identify cultural resources and evaluate them for NRHP eligibility (the process for which is explained below), resulting in the identification of historic properties.
- 3. Assess effects of the project on historic properties.
- 4. Consult with the SHPO and interested parties regarding any adverse effects on historic properties. If necessary, develop an agreement that addresses the treatment of these properties (e.g., a Memorandum of Agreement [MOA]).
- 5. Proceed in accordance with the project MOA, if an MOA is developed.

National Register of Historic Places

First authorized by the Historic Sites Act of 1935, the NRHP was established by NHPA as "an authoritative guide to be used by federal, state, and local governments; private groups; and citizens to identify the nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment." The NRHP recognizes properties that are significant at

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the national, state, and local levels. According to NRHP guidelines, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that meet any of the following criteria:

- Criterion A. A property is associated with events that have made a significant contribution to the broad patterns of our history.
- Criterion B. A property is associated with the lives of persons significant in our past.
- Criterion C. A property embodies 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.
- Criterion D. A property yields, or may be likely to yield, information important in prehistory or history.

The NRHP requires that a resource must not only meet one of these criteria, but must also possess integrity. *Integrity* is the ability of a property to convey historical significance. The evaluation of a resource's integrity must be grounded in an understanding of that resource's physical characteristics and how those characteristics relate to its significance. The NRHP recognizes seven aspects or qualities that, in various combinations, define the integrity of a property: location, design, setting, materials, workmanship, feeling, and association.

An adverse effect on a historic property is found when an activity may alter, directly or indirectly, any of the characteristics of the historic property that render it eligible for inclusion in the NRHP. The alteration of characteristics is considered an adverse effect if it may diminish the integrity of the historic property's location, design, setting, materials, workmanship, feeling, or association. The assessment of effects on historic properties is conducted in accordance with the guidelines set forth in 36 CFR 800.5.

State

State Environmental Policy Act

SEPA requires that all major actions sponsored, funded, permitted, or approved by state and/or local agencies be planned so that environmental impacts on historic and cultural resources can be considered when state agency-enabled projects affect properties of historic, archaeological, scientific, or cultural importance (Washington Administrative Code [WAC] 197-11-960). Similar to NEPA, SEPA considers cultural resources to be properties listed in or eligible for the Washington Heritage Register (WHR), the state equivalent of the NRHP, and sets forth similar criteria for evaluating cultural resources. The WHR, which is administered by the Department of Archaeology and Historic Preservation (DAHP), identifies and records significant historic and prehistoric resources at the state level. Any NRHP-eligible property is automatically eligible for the WHR.

Governor's Executive Order 05-05

Washington State Executive Order 05-05—which requires state agencies with capital improvement projects to integrate DAHP, the Governor's Office of Indian Affairs, and concerned tribes into their capital project planning processes—was signed into action by Governor Christine Gregoire in

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November 2005. All state agency capital construction projects or land acquisitions, not otherwise reviewed under federal law, must comply with this executive order if the projects or acquisitions have the potential to affect cultural resources. Agencies with projects or acquisitions subject to review under the executive order must consult with DAHP and concerned tribes and invite their participation in project planning. If cultural resources are present, then reasonable steps must be taken to avoid, minimize, or mitigate potential effects.

Other State Archaeological Resource Laws

Other state laws that govern the protection of archaeological resources include:

- Revised Code of Washington (RCW) 27.44, Indian Graves and Records, provides protection
 for Native American graves and burial grounds, encourages voluntary reporting of said sites
 when they are discovered, and mandates a penalty for disturbance or desecration of such
 sites.
- RCW 27.53, Archaeological Sites and Resources, governs the protection and preservation of archaeological sites and resources and establishes DAHP as the administering agency for these regulations.
- RCW 36.70A.020 includes a goal to "[i]dentify and encourage the preservation of lands, sites, and structures that have historical, cultural, and archaeological significance." Cities planning under the Washington State Growth Management Act must consider and incorporate this historic preservation goal.
- RCW 68.60, Abandoned and Historic Cemeteries and Historic Graves, provides for the protection and preservation of abandoned and historic cemeteries and historic graves.

Local

San Juan County Unified Development Code 18.50.050

If an area is known to be archaeologically significant, Unified Development Code (UDC) 18.05.050 requires that the county take no action on a development permit application in the vicinity of the archaeologically significant area until the site has been inspected by a qualified archaeologist. Upon application approval, conditions reflecting the archaeologist's recommendations to preserve or protect the resource will be attached to the permit.

UDC 18.05.050 also contains provisions for the protection of archaeological resources and human remains in the event that they are discovered during development activities, discourages development adjacent to archaeological sites that will degrade or destroy the character of the site, and requires that access to public space with documented historical and archaeological resources must be designed and managed to give maximum protection to the resource.

Natural and Cultural Setting

The following is a summary of the key characteristics of the proposed APE's natural and cultural setting. Discussion of the natural setting includes geology, flora and fauna, while discussion of the cultural setting includes a precontact cultural sequence, ethnographic data, and summary of historical land use in the proposed APE vicinity.

2.1 Natural Setting

Geology

The proposed APE is in the Salish Lowland province, a structural depression formed through tectonic pressures related to the subduction of the Juan De Fuca plate under the North American plate (Haugerud 2004). Complex webs of thrusts and faults in the northern Puget Sound have uplifted portions of the mélange of bedrock terranes that compose the base of the structural depression, resulting in the formation of the San Juan Archipelago, which includes the proposed APE (Brandon et al. 1988; Brown et al. 2007).

On multiple occasions during the Pleistocene epoch (2.588 million to 12,000 years ago), the Puget Lowland was overridden by thick sheets of glacial ice that originated in the mountains of central British Columbia (Booth et al. 2003: 28). Each glacial advance scoured and reshaped the topography created by the previous glacial advance and deposited abundant debris. The current topography of much of the lowland is primarily the result of surface scouring, sedimentary deposition, and subglacial trough erosion from the most recent glacial advance, termed the Vashon stade of the Fraser glaciation (Vashon advance) (18,750 and 16,950 years ago) (Goldstein 1994; Porter and Swanson 1998).

Between 16,950 and 16,400 years ago, glacial ice rapidly receded from the Puget Lowland (Goldstein 1994; Porter and Swanson 1998). As a result of glacial loading, the ground surface was significantly lower than at present immediately after recession. Although eustatic (global) sea levels were also significantly lower than at present (around 125 meters; Flemming et al. 1998), the local relative sea level in the proposed APE vicinity would have been between 80 and 90 meters higher than at present (Diether et al. 1995:1298)—meaning that the proposed APE would have been inundated during this period. By around 10,000 years ago, the ground surface had largely rebounded to near its present elevation (Diether et al. 1995:1298), with sub-aerial emergence of the proposed APE occurring relatively soon after glacial recession. The period in which sub-aerial emergence occurred cannot be more precisely determined with the available geologic data.

Starting in the early Holocene, eustatic sea level rise began to outpace isostatic rebound. By the late Holocene, local sea levels approached their modern elevation (Flemming et al. 1998). The proposed APE is just inland of the modern shoreline, on a flat plain a few feet above mean sea level. The proposed APE is bordered by beach deposits to the north and west and surface-exposed glacial deposits to the south (NRCS 2009: Sheet 6). Review of previous soil mapping efforts indicates that the northern half of the habitat restoration portion of the proposed APE is within an area that contains peats and organic sediments, while the southern half is within an area that contains

surface-exposed glacial deposits. The airport portion of the proposed APE appears to be on anthropogenic fill and surface-exposed glacial deposits (NRCS 2009: Sheet 6).

Flora and Fauna

The proposed APE is in the Puget Sound area subtype of the western hemlock (*Tsuga heterophylla*) vegetation zone. Softwoods such as Douglas fir (*Pseudotsuga menziesii*), western hemlock, and western red cedar (*Thuja plicata*) are the dominant tree species in the region, while hardwoods such as red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*) are generally subordinate and found near water courses or riparian habitats. Understory shrubs with potential food and resource value in the western hemlock zone include, but are not limited to, swordfern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), Oregon grape (*Mahonia aquifolium*), vine maple (*Acer circinatum*), blackberry (*Rubus* spp.), ocean spray (*Holodiscus discolor*), salal (*Gaultheria shallon*), blueberries and huckleberries (*Vaccinium* spp.), and red elderberry (*Sambucus racemosa*) (Franklin and Dyrness1988; Pojar and Mackinnon 1994; Gunther 1945).

The proposed APE is in the vicinity of a saltwater shoreline, an environment that supports a number of salt-tolerant plant species—some of which were considered valuable as food and other resources to the precontact peoples of the region. Notable ethnographically important, salt-tolerant plant species in the region include, but are not limited to, springbank clover (*Trifolium wormskioldii*), Pacific silverweed (*Potentilla anserine pacifica*), northern rice-root lily (*Fritillaria camschatcensis*), and Nootka lupine (*Lupinus nootkatensis*) (Pojar and Mackinnon 2004; Deur 2005).

The proposed APE is in the vicinity of a gravel beach, which supports a limited range of nearshore bivalve species of food value, including the Pacific littleneck clam (*Protothaca staminea*) and butter clam (*Saxidomus gigantea*), as well as several species of marine gastropods (Harbo 2004). The channel just north of the proposed APE is one of several major migration routes for sockeye salmon returning the to the Fraser River and supports a range of other marine resources, such as seals, sea lions, and bottom fish (Stein 2000). Terrestrial faunal resources on Orcas Island include, but are not limited to, mule deer (*Odocoileus hemionus*), squirrels (*Sciurus* sp.), muskrat (*Ondatra* sp.), and raccoon (*Procyon lotor*) (Eder 2002).

2.2 Cultural Setting

Precontact

Cultural developments of the Puget Sound area have been summarized by a number of reviewers (Kidd 1964; Greengo and Houston 1970; Nelson 1990; Matson and Coupland 1995; Ames and Maschner 1999). Studies of the archaeology and prehistory of the Puget Sound and surrounding areas divide the prehistoric cultural sequence into multiple phases or periods from about 12,500 to 225 years before present (BP), and are delineated by changes in regional patterns of land use, subsistence, and tool types over time. These phases are academic constructs and do not necessarily reflect tribal viewpoints. This document uses the Pacific Northwest coast precontact cultural sequence provided by Ames and Maschner (1999) to help describe patterns in precontact cultural developments in the Puget Sound. The sequence includes five periods, which are briefly summarized below:

Paleo-Indian (**prior to 12,500 BP**). The Paleo-Indian period is characterized by sparse and highly mobile groups that primarily used terrestrial resources. Assemblages include large stone bifaces and bone technology. Most Puget Sound sites dated to this period consist of isolated large-fluted stone bifaces attributed to the Clovis culture, and are typically located on upland glacial plains.

Archaic (12,500 to 6,400 BP). The Archaic period is characterized by increased technological diversity relative to the Paleo-Indian period. Typically located on alluvial terraces, assemblages include leaf-shaped bifaces, cobble, flake, and bone tools. Evidence of littoral resource use begins to appear during this period in the larger Pacific Northwest region, but not within the Puget Sound.

Early Pacific (6,400 to 3,800 BP). The Early Pacific period is characterized by expanded use of intertidal resources and increased dependence on bone and antler tools relative to the Archaic period. Assemblages include bone points, barbs, and harpoons; ground stone points and celts; and shell middens. Although evidence for the use of upland and riverine resources continued, the earliest evidence for littoral resource use in the Puget Sound also occurs during this period.

Middle Pacific (3,800 to 1800–1500 BP). The Middle Pacific period is characterized by the first evidence of permanent social inequality, as well as a shifting emphasis to a storage-based economy, intensification of salmon fishing, an increase in the variety of bone and antler tools, and near-modern art styling. Assemblages include artifacts similar to those associated with the Early Pacific period as well as plank house remains, wooden boxes, toggling harpoons, fish hooks, and fish rakes. Sites situated along the littoral zone become prevalent during this period.

Late Pacific (1800–1500 to around 225 BP). The Late Pacific period is characterized by the emergence of extremely large houses, heavy-duty woodworking tools, and a decreased reliance on chipped stone tools. Assemblages include artifacts similar to those associated with the Middle Pacific period. The archaeological record from this period comprises primarily littoral and riverine sites.

The first undisputed evidence of human occupation in North America comes in the form of large fluted stone biface and bone technology, identified as Clovis technology. Dated between 12,800 and 12,500 BP, Clovis assemblages are characterized by extensive bone and stone technology. On the west coast of North America, Clovis assemblages are characterized by a wide but sparse distribution of isolated lithic tools and lithic sites. Based on these data, it is hypothesized that the Clovis people were highly mobile terrestrial hunters (Ames and Maschner 1999: 65). Although widespread, artifacts attributed to Paleo-Indian occupation of the Puget Sound are rare, and are commonly recorded as isolated finds on upland terraces associated with peat deposits (Williams et al. 2008). Although no such finds have occurred on Orcas Island, the remains of a now-extinct bison species (Bison antiquus) exhibiting some evidence of human butchering (i.e., fractures, cut marks, abrasion, and polish) were identified in an upland peat bog. Although there is some debate as to whether the remains, which are dated to around 13,500 years ago, can be attributed to humans, they potentially represent one of the earliest examples of human occupation of North America (Wilson et al. 2009).

Archaeological sites attributed to the Archaic and Early Pacific periods are relatively infrequent in the Puget Sound, and are typically located on uplands along drainages. Sites associated with this period typically contain scatters of flakes, cores, and cascade-style projectile points, and are commonly referred to as *Olcott complex sites*. Olcott complex sites are named for artifact assemblages that embody the attributes of Early period archaeological sites, as defined in Kidd's (1964) cultural chronology and the Olcott site (45SN14) in Snohomish County. Based on stylistic comparisons with similar lithic tools associated with organic materials that have been subject to

radiometric dating at the Glenrose Cannery site in British Columbia, it is postulated that Olcott complex sites are comparable to the Glenrose Cannery site in age, and, therefore, were used between 8,000 and 4,000 BP (Nelson 1990). Although uncommon, at least one well-studied site that contains artifacts and deposits that appear to date to the Archaic or Early Pacific periods is located in San Juan County. 45SH1 (i.e., Cattle Point Site) on San Juan Island contains stratified archaeological deposits with tools at the bottom-most levels that are stylistically similar to those found in Olcott complex sites. The site also contains tools and artifacts at the uppermost levels that appear to date to the Middle and Late Pacific Period (Stein 2000).

As with much of the Puget Sound, the vast majority of documented Middle to Late Pacific Period archaeological sites on Orcas Island are located along the coastal margin. These sites are almost exclusively composed of a single site type—shell midden (i.e., accumulations of dark soil, shell and bone fragments, stone debitage and tools, and fire-modified rock) (Wessen 1986). Documented upland sites from these periods are absent on Orcas Island, but this absence is likely a function of the paucity of materials suitable for radiometric or comparative analysis rather than a pattern in precontact land-use.

Ethnography and Ethnohistory

The proposed APE is within an area that was traditionally inhabited by Central Coast Salish peoples who spoke the Northern Straits dialects of the Salish language (Suttles 1990: 454). Of the six historically identified Northern Straits tribes, four (the Lummi, Saanich, Samish, and Songhees) had winter villages on the San Juan Islands, although the proposed APE falls within an area that was commonly used by the Lummi (Amoss 1978). Many descendants of these groups are now affiliated with federally recognized tribes and nations that share their traditional namesakes (i.e., Lummi Tribe, Saanich Nation, Samish Indian Nation, Songhees First Nation).

Consistent with many of the tribes and bands of the Puget Sound and Georgia Strait, the people of the Northern Straits relied on fisheries, particularly salmon, for food. They also relied upon edible plants and hunting of terrestrial mammals. The people of the Northern Straits followed a seasonal settlement pattern. During the winter months, they lived in rows of plank houses—commonly shedroofed—along the shoreline. In the summer months, the inhabitants of these villages dispersed into smaller groups and established smaller temporary structures made of woven mats, bark, or wood (Suttles 1990: 458-462).

Although a small number of Europeans and European Americans passed through the Northern Straits area during the late eighteenth and early nineteenth centuries, the effects of the diseases that they brought with them were immediately felt. The first smallpox epidemic in the region may have occurred as early as the 1770s. Following the ratification of the Treaty of Washington between the United States and Canada in 1871, the peoples of the Northern Straits were divided by an administrative boundary that would affect how they would later be recognized and allotted land. On the United States side of the border, Lummi representatives signed the Treaty of Point Elliott in 1855, which established the Lummi Reservation as a permanent home for the Lummi, Nooksack, and Samish (Ruby and Brown 1992: 111-112; Suttles 1990: 471-472).

Historic Context

Starting in the middle nineteenth century, Europeans and European Americans began to settle the San Juan Islands. Much of the early settlement activity occurred on San Juan Island, where escalating

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tensions between Great Britain and the United States over the ownership of the island resulted in the establishment of military camps on opposite sides of the island, which was followed by both sides agreeing to have a joint military presence. This arrangement continued until the island was officially recognized as a territory of the United States in the Treaty of Washington (1871) (Richardson 1990).

European American settlement of Orcas Island was slow and sparse prior to the ratification of the Treaty of Washington in 1871. By 1890, however, much of the Eastsound vicinity had been homesteaded and was used for agriculture. The island produced a wide variety of agricultural products, including cattle, fruit, grain, peas, pork, potatoes, poultry, and sheep, as well as raw materials such as limestone and timber. As advances in transportation and agricultural infrastructure increased and agricultural products from eastern Washington became less expensive, the market for agricultural products from Orcas Island diminished. Starting in the early twentieth century, the local economy began to shift to tourism (Splitstone 1946). Tourism continues to play a major role in the Orcas Island economy (Carter 2012).

Development within, and directly adjacent to, the proposed APE appears to have been limited during the late nineteenth century (GLO 1874), and limited information from the early twentieth century is available about the proposed APE. After it was established by the citizens of Orcas Island in 1958, the Port of Orcas purchased a piece of property from the Ferris family within the APE to build an airstrip. Additional land was purchased to expand the airstrip and add buildings on multiple occasions between 1975 and the present (Port of Orcas 2010). During this period, the wetland mitigation portion of the proposed APE remained undeveloped, with the exception of the excavation of a small pond at its southern margin prior to 1978 (NETR Online 2013).

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ICF International (ICF) archaeologists performed a record search on November 21, 2013 and later on June 23 to incorporate additional project elements to the APE. The record search was performed using the Washington Information System for Architectural and Archaeological Records Database (WISAARD) to identify previously documented archaeological, ethnographic, and historic resources within a 0.5-mile radius of the proposed APE. WISAARD contains all records and reports on file with the Washington DAHP. This database includes completed cultural resources survey reports, properties listed in (or determined eligible for listing in) the NRHP, WHR-listed properties, archaeological sites, cemeteries, and inventoried historic resources.

No previously completed cultural resources studies, documented archaeological sites, or built environment resources are located within the proposed APE.

Forty-one cultural resources investigations have been performed within 0.5 mile of the proposed APE (Table 3-1). Seven archaeological sites were encountered or identified as a result of these investigations (table 3-2). All of which are precontact shell middens on beach elements, many of which with both disturbed and intact deposits.

Of the seven identified archaeological sites within the vicinity of the proposed APE, six are located south of the proposed APE, along the south facing beaches of East Sound on Fishing Bay and Ship Bay. Four of these sites (45SJ239, 45SJ240, 45SJ241, 45SJ540) contain archaeological materials, two of which potentially contain both historic and precontact components. Human remains have been identified in the shell midden at three of the archaeological sites (45SJ239, 45SJ240, 45SJ241). There is limited information about the two remaining sites (45SJ550, 45SJ552), which is likely a function of the fact that both have been subject to limited study. A single archaeological site (45SJ438) was identified along a north-facing beach between 200 and 400 meters northwest of the proposed APE. The site boundaries were defined during several of the investigations (Bush 2006; Bush and Ferry 2005; Bush and Hutchings 2005; Kenady 2003, 2005, 2008a, 2008b; Kenady and Schalk 2011). The site is a precontact shell midden with disturbed and intact elements. It contains shell, fire-modified rock, small mammal bone, and lithic artifacts and has a poorly defined boundary. Although numerous historic resources are located within 0.5 mile of the proposed APE, it is impractical to list them in this document, and doing so would not substantively contribute to how the survey would be performed or its outcome.

Table 3-1. Cultural Resources Investigations within 0.5 Mile of the Proposed APE

NADB	Author (year)	Report Title	Description	Cultural Resources
1340532	Kenady (2001)	Archaeological Monitoring and Bulk Sampling During Power Pole Replacement, 45SJ240: Crescent Beach	Monitoring of utility instalments	45SJ240
1343071	Schalk (1998)	Archaeological Survey for the Main Street Project Eastsound	Subsurface investigations	45SJ239
1343097	Daugherty (1997)	An Archaeological Evaluation of Lot 13, Fishing Bay Addition, Orcas Island, Parcel 271451013000	Subsurface investigations	45SJ240

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1343275	Kenady (2004)	Letter to Tom Cavanaugh Regarding Archaeological Survey and Recommendations for The Eastsound Mixed Use Building Project	Pedestrian survey and limited shovel probes	None
1344414	Kenady (2004)	Cultural Resource Damage Assessment and Survey of the Whittier Property on Orcas Island, Parcel #2271460002	Subsurface investigations and visual inspection of disturbed deposits	45SJ241
1347422	Kenady (2006)	Cultural Resource Survey of the Fishing Bay LLC Project Area in Eastsound on Orcas Island	Pedestrian survey	45SJ239
1348104	Boersema (2006)	Archaeological Investigations for Opal Community Land Trust, Mount Baker Road Property, Eastsound, San Juan County, Washington	Pedestrian survey and limited shovel probes	None
1349047	Kaiser et al. (2007)	Archaeological Assessment of the DeMeritt Property, Eastsound, Orcas Island, Parcel 271451007	Pedestrian survey and subsurface investigations	None
1349549	Boersema (2007)	Letter to Holly Mercier RE: Archaeological Monitoring of foundation excavation and discovery of human remains, Parcel 271460002	Monitoring of ground disturbance	Human remains discovered in association with historic artifacts
1350005	Boersema (2007)	Letter to Terry Whittier RE: Recovery of Disturbed Human Remains, Additional Archaeological Survey and Proposed Changes to Cottage Location, Parcel 271460002	Subsurface investigations and screening of previously removed materials	45SJ241, historic and precontact materials
1350106	Wessen (1995)	Letter to John Jensen RE: Observations Regarding the Disturbance of Archaeological Site 45SJ240, Burghardt Property, Orcas Island, Parcel 271441008	Background research and observations of disturbance	None
1351186	Boersema (2007)	Archaeological Monitoring and Recovery of Human Remains at 45SJ241, Madrona Point, Eastsound	Monitoring of ground disturbance and human remains recover	45SJ241, human remains discovered
1351234	Kenady (2008)	Cultural Resources Survey and Management Recommendations for the Cohen Property in Eastsound on Orcas Island, Parcel 271451012	Pedestrian survey and mechanical trenching	45SJ239
1351267	Wessen (2008)	An Archaeological Survey and Evaluation of Selected Portions of the Malzon Property, Crescent Beach, Orcas Island	Pedestrian survey and mechanical trenching	45SJ240
1351443	Kenady (2008)	Cultural Resource Damage Assessment and Management Recommendations for the Emmanuel Church Property in Eastsound on Orcas Island, Parcel P271442007	Pedestrian survey	45SJ239
1351482	Schwarzmil ler (2002)	Letter to Chuck Armstrong RE: Monitoring of the Benson Hall Removal and Site Preparation for New Construction, Parcel	Monitoring of ground disturbance	45SJ239

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		271442007		
1352143	Wessen (2008)	Letter to Ron Malzon RE: Archaeological Monitoring of Ground-Disturbance at your Property at Crescent Beach, Orcas Island	Monitoring of ground disturbance	None
1352985	Boersema (2009)	Cultural Resource Investigations for the North Beach Gardens Housing Development, Orcas Island, Washington	Pedestrian survey and limited shovel probes	None
1353975	Taylor (2009)	The San Juan Islands Archaeological Project, 2008	Subsurface investigations by auguring and bank exposures	45SJ239 and 45SJ240 among others
1354483	Kenady et al. (2010)	A Cultural Resources Survey for the Eastsound Water Users Association Main and Hydrant Project, Eastsound, San Juan County, Washington	Pedestrian survey and shovel probes	None
1354970	Schalk and Kenady (2010)	Cultural Resource Survey and Management Recommendations for the Emmanuel Church Property in Eastsound on Orcas Island	Subsurface investigations by Core sampling	45SJ239
1681484	Kenady et al (2011)	Cultural Resources Investigations for the Tompkins Property, Orcas Island	Pedestrian survey and Subsurface investigations by Core sampling	45SJ540
1681747	Trost et al. (2010)	A Cultural Resources Survey for the Mt Baker Road and Trail Improvements Project, Eastsound, San Juan County, Washington	Historic property survey, pedestrian survey and shovel probes	None
1682170	Wessen (2012)	Archaeological Site Testing Activities on the Tompkins Property (45SJ540), Madrona Point, Orcas Island, Parcel 271460054000	Subsurface investigations by Core sampling	45SJ540
1682413	Wessen (2012)	Probing the Deposts Beneath the Existing House and in the Proposed Utility Trench Alignment on the Tompkins Property at Madrona Point, Orcas Island	Subsurface investigations by Core sampling	45SJ540
1682480	Troost (2011)	Letter to Harlan Pedersen RE: Archaeological Monitoring for the Emmanuel Episcopal Church Labyrinth Project	Monitoring of ground disturbance	45SJ239
1682896	Wessen (2012)	A Report of Archaeological Monitoring on the Tompkins Property, Madrona Point, Orcas Island	Monitoring of ground disturbance	45SJ540
1683262	Wessen (2012)	An Archaeological Survey of the Langley Property Project Area, Eastsound, Orcas Island	Pedestrian survey and subsurface investigations	None
1683405	Wessen (2013)	Archaeological Data Recovery Activities at the Tompkins Cabin Site (45SJ540), Madrona Point, Orcas Island	Archaeological Excavations	45SJ540
1683964	Nelson (2013)	Cultural Resources Survey of the Smugglers' Village Replacement Project, Orcas Island, San Juan County	Historic property survey, pedestrian survey and shovel probes	None
1684246	Wessen	An Archaeological Monitoring on the	Archaeological	45SJ552

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	(2013)	Langley Property Project Area, Eastsound, Orcas Island	monitoring	
1684477	Wessen (2013)	Probing Cultural Deposits in the Outlook Inn's Event Center Project Area, 45SJ239, Eastsound, Orcas Island	Pedestrian survey and Auger probes	45SJ239
1353711	Barrett (2009)	Cultural Resources Survey, port of Orcas Airport Outfall Relocation Project	Pedestrian survey and shovel probes	None
1345051	Kenady and Wigen (2005)	Archaeological Monitoring and Bulk Sampling of the 2003 OPALCO Underground Cable Conversions in San Juan County Washington	Archaeological monitoring	None
1245008	Kenady (2005)	Archaeological Survey of the Telfer Property on Orcas Island in San Juan County, Washington	Pedestrian survey and shovel probes	45SJ438
1346735	Bush and Hutchings (2005)	Archaeological Investigation Report, Orcas Island, Washington, Parcel # 271123013	Mechanical trenching and shovel probes	45SJ438
1347528	Bush (2006)	Re: Monitoring Excavation on Property: 98 Bunny Lane, Orcas Island, Parcel# 271123013	Archaeological monitoring	45SJ438
1350642	Kenady (2008a)	Archaeological Survey with Recommendations for the Warburton Property on Orcas Island in San Juan County, Washington	Pedestrian survey, shovel probes, and auger probes	45SJ438
1354155	Kenady and Nelson (2010)	Cultural Resource Survey of the Baker Property on Orcas Island in San Juan County, Washington	Shovel probes	None
1680812	Kenady and Schalk (2011)	Archaeological Survey of the Boone Property on Orcas Island in San Juan County, Washington	Pedestrian survey, shovel probes, and auger probes	45SJ438
1683152	Mather and Watrous (2012)	Archaeological Assessment for the Proposed Home Addition and Septic System Installation at 164 Bunny Lane Orcas Island [TPN 271123006], San Juan County, Washington	Pedestrian survey and shovel probes	None

NADB=National Archaeological Database

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Table 3-2. Archaeological Sites within .05 Miles of the Proposed APE

Site Number	Site Type	Description	Eligibility Status
45SJ239	Shell Midden, with potential Precontact and historic Components precontact burial	Shell midden with few lithic artifacts, three identified hearth features. Human remains have bed identified.	Not Evaluated
45SJ240	Precontact Shell Midden, precontact burial,	Large, dense shell midden with lithic debitage fragments. Human remains have bed identified.	Not Evaluated
45SJ241	Shell Midden, with potential Precontact and historic Components precontact burial	Shell midden with few lithic artifacts, three identified hearth features. Human remains have bed identified.	Eligible
45SJ438	Precontact shell midden	Shell midden with disturbed and intact elements, contains shell, fire-modified rock, small mammal bone, and lithic artifacts and has a poorly defined boundary	Not Evaluated
45SJ540	Precontact Shell Midden	Small, shell midden with intact and disturbed deposits, lithic debitage fragments and few stone tools present	Not Evaluated
45SJ550	Precontact Shell Midden	Shell midden on small island, Historic/modern disturbance, no cultural materials observed	Not Evaluated
45SJ552	Precontact Shell Midden	Shell midden with disturbed and intact elements, contains shell, fire-modified rock, small mammal bone, no cultural materials observed	Not Evaluated

The following is a summary of the expectations for archaeological resource sensitivity going into the survey and, as a result, the methods that were chosen to conduct the survey.

4.1 Expectations

The following expectations were derived from an analysis of the background information provided in Chapters 2 and 3:

- The northern portion of the proposed APE has been subject to sedimentary deposition during the period of documented human occupation in the region. The northeastern potion of the proposed APE appears to contain deposits of anthropogenic fill at the ground surface, while the northwestern portion of the proposed APE appears to contain organic sediments. Given the timing of sedimentary deposition in these areas, buried intact archaeological deposits are possible in this portion of the proposed APE.
 - The southern portion of the proposed APE appears to have been subject to limited sedimentary deposition during the period of documented human occupation in the region. Thus, it is anticipated that archaeological deposits would be located at or near the ground surface in areas that have not been modified during the historic and modern period, or at the fill/native interface in areas that have been filled during the historic and modern period.
- The presence of organic sediments in the northwestern portion of the proposed APE may indicate that it was originally an embayment or lagoon that has since in-filled. Since an embayment or lagoon would have served as an excellent resource collection area but would not have been suitable for human occupation, it is anticipated that archaeological deposits associated with habitation and resource processing would be most likely at the margins of the organic sediments—where a stable terrestrial surface would have been present—rather than within the organic sediments. Resource collection activities have occurred within embayments and lagoon environments, but tend to result in very limited and diffuse archaeological deposits.
- Review of the precontact culture sequence, ethnographic literature, and records search
 reveals that the proposed APE vicinity was used by the precontact inhabitants of the region,
 as demonstrated by the presence of a precontact shell midden (45SJ438) just north of the
 proposed APE. Although there are no documented precontact archaeological sites within the
 APE, this absence is a function of the paucity of previous cultural resources surveys within
 the proposed APE.
- Review of the local historic context reveals that the proposed APE appears to have remained largely undeveloped until the middle twentieth century. Starting in the middle twentieth century, the western half of the proposed APE was subject to cutting and filling with the construction and expansion of the Orcas Island airport, while the eastern half of the proposed APE remained undeveloped. On landforms of all ages, filling has the potential to

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bury intact archaeological deposits. On landforms that were formed prior to the period of documented human occupation in the region, cutting is likely to result in the removal of sediments that have the potential to contain archaeological deposits. On landforms that were formed during the period of documented human occupation in the region, the potential for encountering buried archaeological deposits may remain.

Based on an examination of the existing archaeological and geological information, the likelihood of encountering surface-exposed and buried archaeological sites was considered to be low to moderate in the airport improvement portion of the proposed APE and moderate to high in the wetland mitigation portion of the proposed APE prior to field investigations.

4.2 Methods

Based on the expectations described above, ICF archaeologists designed and performed a cultural resources survey of the proposed APE using standard DAHP-accepted methods appropriate for finding and recording cultural resources. Three approaches to field investigations were used during the survey: (1) pedestrian survey, (2) subsurface investigations, and (3) a reconnaissance-level historic built resource survey.

Pedestrian Survey

ICF archaeologists performed a pedestrian survey of the proposed APE to identify archaeological deposits and features on the ground surface. This involved walking across the proposed APE and visually inspecting the ground surface. The pedestrian survey also involved inspection of the local topography to identify areas that have been subject to modern anthropogenic landscape alteration.

Subsurface Investigations

ICF archaeologists employed two subsurface sampling techniques: shovel probes (SPs) and auger probes (APs). Both were used to determine whether subsurface archaeological deposits were present and to characterize the local geology and landscape history. SPs (45 centimeters in diameter) and APs (10 centimeters in diameter) were strategically spaced across locations where project-related ground disturbance was anticipated to occur in areas not covered in asphalt, concrete, buildings, or other modern infrastructural or structural features. SPs were excavated in areas where compaction and gravel size was likely preclude the use of an auger, and excavations occurred to a depth of 100 centimeters below ground surface unless undisturbed glacial deposits or impassable conditions were encountered. APs were excavated along the shoreline margin of what was interpreted to be an in-filled lagoon in the wetland mitigation portion of the proposed APE, and excavations occurred until undisturbed glacial deposits or impassable conditions were encountered. The contents of all SPs and APs were excavated by hand and sediments screened through 6-millimeter (0.25-inch) mesh hardware cloth.

Following excavation, the sedimentary composition of each SP and AP was analyzed. Key sedimentary context indicators were recorded, including sediment composition listed from smallest constituent to largest constituent (e.g., gravelly sandy silt) and their grain sizes (fine to coarse), structure (e.g., laminated, blocky, massive), compaction (loosely, densely), inclusions of historic or modern debris, and the depth below surface for interfaces between distinct sediment units.

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Representative SPs were then photographed using a digital camera. All SPs and APs were mapped with a handheld Global Positioning System unit, and backfilled.

On November 26 and 27, 2013, ICF archaeologists J. Tait Elder, MA, and Patrick Reed, BA, performed a cultural resources survey within the airport improvement and wetland mitigation portions of the proposed APE. On June 25th, 2014 ICF archeologists Shane Sparks, BA, and Patrick Reed returned and surveyed a newly included portion of proposed APE where vegetation removal is planned. The survey included a pedestrian survey and the excavation of 53 SPs and 12 APs (Figure 5-1). No cultural resources were identified during the survey.

5.1 Pedestrian Survey

The proposed APE is at the base of a gentle north-sloping trough. Based on the presence of a noticeable beach berm just north of the proposed APE, as well as surface-exposed peat and occasional areas of standing water at the northern end of the wetland mitigation portion of the proposed APE, it is likely that the northern portion of the proposed APE is a relict back-beach lagoon that has in-filled. This observation was later corroborated by the results of the subsurface investigations.

Ground surface visibility is poor (0% to 10%) across the majority of the proposed APE, with slightly better ground surface visibility (10% to 25%) in the forested portion of the wetland mitigation area. Visual inspection of the topography and analysis of Light Detecting and Ranging (LiDAR) imagery of the airport improvement portion of the proposed APE indicated that the northern third of the runway is built on fill, while the southern two-thirds of the runway has been graded to make the airport runway level (Figure 5-1; Appendix A: Photos). With the exception of previous vegetation removal and the presence of a series of small drainage ditches, the wetland mitigation portion of the proposed APE appears to have been subject to limited anthropogenic alteration. The vegitation removal portion of the proposed APE showed signs of grading activities and agricultural vegetation removal along the western boundary as the forested area transitions to the open field. The forested area is comprised of young planted fir trees, hawthorn trees and dense blackberry brush. A drainage swale oriented north to south runs along the western boundary of the larger eastern section of this portion of the proposed APE, and connects to the swales and ditches observed in the airport improvement portion of the proposed APE.

Review of available historical literature revealed no information about the origins or ages of the drainage ditches in the wetland mitigation portion of the proposed APE, but several appear to serve as outlets for a maintained drainage channel that runs along the western margin of the airport runway. Three of the ditches appear to be maintained, as evidenced by the absence of vegetation, while at least two others are currently no more than slight depressions that have in-filled with vegetation. In the absence of documentary information about the drainage ditches, it is inferred that these ditches are modern in origin and currently support, or had previously supported, drainage of the current airport runway.

No buildings are located within the proposed APE.

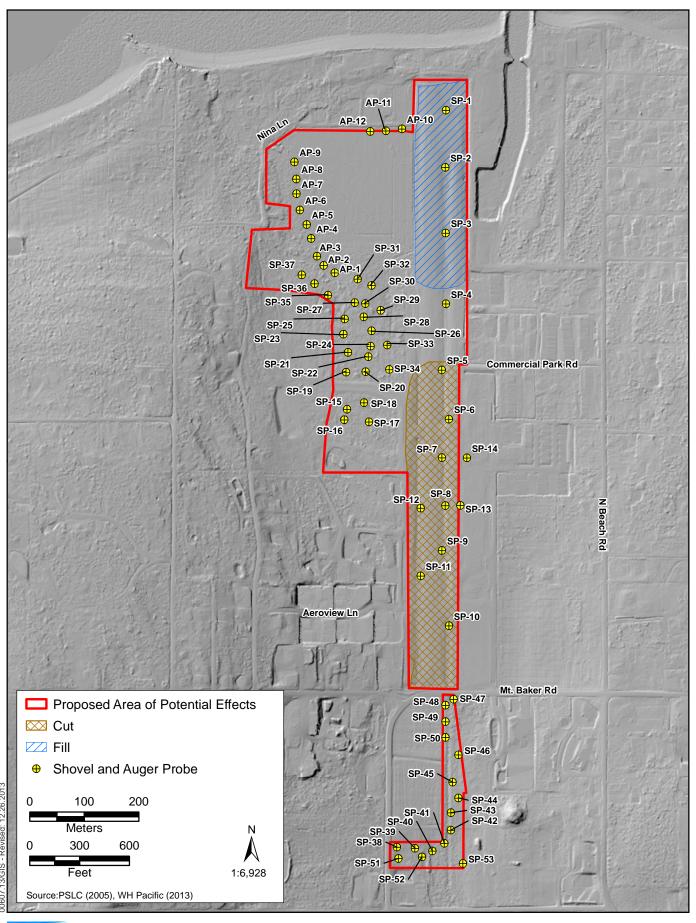




Figure 5-1 Shovel and Auger Probe Locations Orcas Island Airport Improvements Project

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5.2 Subsurface Investigations

A total of 53 SPs and 12 APs were excavated within the proposed APE. 14 SPs were excavated in the airport improvement portion of the proposed APE, while 23 SPs and 12 APs were excavated in the wetland mitigation portion of the proposed APE and 16 SPs were excavated in the vegitation removal portion of the proposed APE. SPs were strategically placed in locations where ground disturbance is proposed or possible, and APs were systematically placed along the northwestern margin of the wetland mitigation portion of the proposed APE to search for evidence of a relict lagoon shoreline or relict terrestrial surface below peat and muck deposits. Review of sedimentary composition and stratigraphy in SPs and APs revealed three discrete strata. Table 5-1 summarizes the physical attributes and inferred depositional environment for each deposit. Descriptions of each SP and AP are provided in Appendix B.

Table 5-1. Deposit Descriptions and Inferred Depositional Environments

Strat Designation	Deposit Description	Inferred Depositional Environment
Strat 1	Grey coarse sand to brown sandy silt, loose to moderately compacted with angular gravels	Fill-redeposited from multiple origins
Strat 2	Very dark brown silty fine to medium sand, loose to moderately compacted	Native soil development in glacial parent material
Strat 3	Brown to very dark brown, sandy organic fibrous peat, moderately compacted	Peat, lagoon in-filling
Strat 4	Bluish gray fine to medium sand, moderate to densely compacted	Beach sands
Strat 5	Grayish brown coarse sand to bluish gray, fine to medium sandy silt, very densely compacted, with FeO2 sand concretions	Glacial

The airport improvement portion of the proposed APE contained widespread deposits of fill or mixed glacial deposits overlaying glacial deposits. The fill deposits (Strat 1) were thickest at the northern end of the proposed APE in SPs 1 through 5, where it was observed from surface to approximately 50 to 100 centimeters (19.7 to 39.4 inches) below surface. Multiple, distinct fill deposits were observed, indicating several sources of origin. At the southern end of the airport improvement portion of the proposed APE in SPs 6, 7, 9, 12, and 14, a weakly developed soil had developed over glacial deposits (Strat 2), likely indicating relatively recent removal of the ground surface. Fill was underlain by glacial deposits (Strat 5).

The deposits observed in the wetland mitigation portion of the proposed APE consisted of two distinct profiles. At the north end of the mitigation area, thick peat deposits (Strat 3)—thought to have been deposited in a back-beach lagoon that was eventually in-filled—were observed overlying beach sands (Strat 4). Strat 3 ranged from a few centimeters to 145 centimeters (57 inches) in thickness. The southern end of the mitigation area consisted of thick soils (up to 47 centimeters [18.5 inches]) formed in glacial deposits (Strat 2), which eventually graded into unweathered glacial deposits (Strat 5).

The deposits observed during the excavations of the SPs (SP-38 through SP-53) in the vegetation removal portion of the proposed APE consisted of two distinct sedimentary profiles. A majority of the SPs excavated across this area consisted of thick soils (up to 56 centimeters [22 inches]) formed

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in glacial deposits (Strat 2), which abruptly transitioned into unweathered glacial deposits (Strat 5). Three of the SPs (SP-01, SP-02 and SP-15) contained an upper deposit similar to that observed in the other SPs excavated, however the deposit in these SPs contained higher percentage of angular to rounded larger gravels, and showed signs of mixing indicating their presence as fill. These fill deposits also abruptly transitioned glacial sands, Strat 5 deposits.

6.1 Conclusions

No cultural resources were identified during the survey of the proposed APE. Analysis of LiDAR imagery and shovel probe data revealed that the northern third of the airport improvement portion of the proposed APE is composed of fill that is greater than 1 meter in thickness and that the southern two-thirds of the airport improvement portion of the proposed APE is in an area that has been subject to cutting, thus limiting the potential for encountering archaeological deposits in this area. The wetland mitigation portion of the proposed APE appears to have been subject to limited development—primarily vegetation removal. A series of drainage ditches are located in the northern half of the wetland mitigation portion of the proposed APE, but they appear to be modern in origin and either currently support, or had previously supported, drainage of the airport runway. The vegetation removal portion of the proposed APE similarly showed signs of filling at the southern end, and potential cutting associated with field clearing or leveling, as such the potential for encountering archaeological deposits in this area is also limited.

6.2 Recommendations

Based on the results of the survey presented in this report, the project is not expected to adversely affect NRHP-eligible resources. Therefore, a finding of "no historic properties" is recommended for this undertaking.

Although no cultural resources were identified during the survey of the wetland mitigation portion of the proposed APE, investigations were limited in this area because the exact locations of proposed wetland mitigation activities were not known at the time of the cultural resources survey. As a result, this area retains the potential to contain archaeological deposits in areas that were not subject to cultural resources investigations. Thus, additional consideration of cultural resources is recommended if proposed wetland mitigation project elements occur outside of locations that were subject to subsurface investigations.

Since the proposed APE is in the vicinity of a documented precontact archaeological site, ICF recommends the use of an unanticipated discovery plan which is provided in Appendix C. The plan outlines the specific procedures that Port personnel and contractors follow if cultural resources or human remains are discovered during the project. If, over the course of the project, human skeletal remains are discovered, the Island County Sheriff or Coroner and DAHP must be notified immediately. If archaeological materials are uncovered, the Port and its contractors must immediately stop work, and the Port project manager must contact the FAA environmental protection specialist. Ground disturbance should not re-commence in the vicinity of the find until formal consultation with the affected parties has occurred and permission from the FAA cultural resources specialist has been obtained.

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Appendix A

Photos



Overview of northern third of the Orcas Airport runway. Note gradual north-facing slope. View North





Overview of cut area - indicated by a gradual east-facing slope - along the west-central margin of the Orcas Airport runway. View north-northwest.



Overview of fill area at southern third of the Orcas Airport runway. Note increase in elevation associated with airstrip in background. View east.

Appendix B

Field Data

Shovel Probe Table

SP Number	Depth (cmbs)	Description	Comments	Origin	Artifact Presence
SP-1	0-28	Grey, coarse sand and angular gravels,		Redeposited/	None
· -	0 _0	loosely compacted		fill	
	28-55	Brown sandy silt, moderately compacted	Water at 40 cmbs	Redeposited/	None
		with angular gravels		fill	
	55-75	Bluish gray, fine sandy silt, very densely		glaciomarine	None
		compacted			
SP-2	0-42	Coarse sand and rounded to subrounded		Redeposited/	None
		gravels, loosely compacted		fill	
	42-78	Brown silty fine to medium sand, loose to	Wet, terminated	Redeposited/	None
		moderately compacted with few organics	on impassible	fill	
		and gravels	object		
SP-3	0-42	Grey, coarse sand and angular gravels,		Redeposited/	None
		loosely compacted		fill	
	42-95	Grey fine to medium sand, loosely		Redeposited/	None
		compacted, mottled throughout		fill	
	95-100	Bluish gray, fine sandy silt, very densely	Asphalt rubble,	Redeposited/	None
		compacted	water at 80 cmbs	fill	
SP-4	0-51	Brown to reddish brown, silty fine to		Redeposited/	None
		medium sand, loose to moderately		fill	
		compacted with few organics and gravels			
	51-100	Grey and tan medium sand, moderately		glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-5	0-75	Grey, medium sand and angular gravels,		Redeposited/	None
		moderately compacted, mottled		fill	
		throughout			
	75-100	Bluish gray, fine sandy silt, very densely	Water at 80 cmbs	glaciomarine	None
		compacted			
SP-6	0-100	Grey, medium sand and angular gravels,		Redeposited/	None
		moderately compacted, mottled		fill	
		throughout			
SP-7	0-11	Brown silty fine to medium sand, loose to		"A" horizon	None
		moderately compacted			
	11-100	Grey coarse sand, moderately compacted		Glacial	None
		mottled in the upper 20cm			
SP-8	0-57	Grey, medium sand and angular gravels,		Redeposited/	None
		moderately compacted, mottled		fill	
		throughout			
	57-100	Bluish gray, fine sandy silt, very densely	Water at 80 cmbs	Glacial	None
		compacted			
SP-9	0-10	Brown silty fine to medium sand, loose to		Native	None
		moderately compacted		sediments/	

SP Number	Depth (cmbs)	Description	Comments	Origin	Artifact Presence
	, ,			disturbed	
	10-100	Grey coarse sand, moderately compacted mottled throughout	Water at 80 cmbs	Glacial	None
SP-10	0-68	Bluish gray clayey silt, densely compacted, mottled throughout		Redeposited/ fill	None
	68-100	Bluish gray, fine sandy silt, very densely compacted	Water table at 75 cmbs	Glacial	None
SP-11	0-40	Bluish gray, fine sandy silt, densely compacted, mottled throughout		Redeposited/ fill	None
	40-45	Bluish gray, fine sandy silt, very densely compacted		Glacial	None
SP-12	0-7	Brown silty fine to medium sand, loose to moderately compacted		Redeposited/ fill	None
	7-50	Grey coarse sand, densely compacted mottled throughout		Glacial	None
SP-13	0-52	Grey fine to medium sand, loosely compacted, mottled throughout		Redeposited/ fill	None
	52-78	Grey coarse sand, densely compacted, occasional angular gravels	Drain pipe at the base of test	Redeposited/ fill	None
SP-14	0-15	Brown silty fine to medium sand, loose to moderately compacted		Native sediment/ disturbed	None
	15-100	Grey coarse sand, densely compacted mottled throughout		Glacial	None
SP-15	0-23	Very dark brown silty fine to medium sand, loose to moderately compacted		Native sediment	None
	23-80	Tannish gray coarse sand, densely compacted, FeO2 sand concretions		Glacial	None
SP-16	0-21	Very dark brown silty fine to medium sand, loose to moderately compacted		Native sediment	None
	21-70	Tannish gray coarse sand, densely compacted, FeO2 sand concretions		Glacial	None
SP-17	0-19	Very dark brown silty fine to medium sand, loose to moderately compacted		Native sediment	None
	19-62	Tannish gray coarse sand, densely compacted, FeO2 sand concretions below 65		Glacial	None
SP-18	0-35	Mixed brown and grayish brown silt and fine sand		Native sediment/ Disturbed	None
	35-100	Tannish gray coarse sand, densely compacted, FeO2 sand concretions below 65		Glacial	None
SP-19	0-30	Very dark brown silty fine to medium		Native	None

SP	Depth		_		Artifact
Number	(cmbs)	Description	Comments	Origin	Presence
		sand, loose to moderately compacted		sediment	
	30-75	Tannish gray coarse sand, densely		Glacial	None
		compacted, FeO2 sand concretions below			
<u> </u>	0.44	65			
SP-20	0-41	Very dark brown silty fine to medium		Native	None
	44.62	sand, loose to moderately compacted		sediment	N
	41-63	Tannish gray coarse sand, densely		Glacial	None
CD 21	0.26	compacted with mottling		Native	None
SP-21	0-36	Very dark brown silty fine to medium sand, loose to moderately compacted		Native sediment	None
	36-80	•			None
	36-80	Tannish gray coarse sand, densely compacted with mottling and FeO2 sand		Glacial	None
		concretions			
SP-22	0-47	Very dark brown silty fine to medium		Native	None
JF-22	0-47	sand, loose to moderately compacted		sediment	None
	47-66	Tannish gray coarse sand, densely		Glacial	None
	47 00	compacted with mottling		Glaciai	None
SP-23	0-27	Very dark brown silty fine to medium		Native	None
31 23	0 27	sand, loose to moderately compacted		sediment	None
	27-59	Tannish gray coarse sand, densely	Water at 55 cmbs	Glacial	None
	2, 33	compacted with mottling and FeO2 sand	viater at 55 cm.55	Ciaciai	
		concretions			
SP-24	0-37	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	37-60	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-25	0-28	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	28-100	Tannish gray coarse sand, densely	Water at 85 cmbs	Glacial	None
		compacted with mottling and FeO2 sand			
		concretions			
SP-26	0-32	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	32-52	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-27	0-27	Very dark brown silty fine to medium		Native	None
	-	sand, loose to moderately compacted		sediment	
	27-80	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling and FeO2 sand			
		concretions			
SP-28	0-31	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	31-50	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			

SP	Depth				Artifact
Number	(cmbs)	Description	Comments	Origin	Presence
SP-29	0-29	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	29-50	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-30	0-27	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	27-38	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling and FeO2 sand			
		concretions			
SP-31	0-34	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	34-48	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-32	0-38	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	38-50	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling		outwash	
SP-33	0-31	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	31-57	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling and FeO2 sand			
		concretions			
SP-34	0-28	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	28-55	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-35	0-20	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	20-47	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-36	0-31	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	31-57	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-37	0-23	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	23-58	Tannish gray coarse sand, densely		Glacial	None
		compacted with mottling			
SP-38	0-30	Brown sandy silt, moderately compacted		Redeposited/	None
		with angular gravels		fill	
	30-42	Grey and tan medium sand, moderately	Few gravels	Glaciomarine	None
		compacted, mottled with FeO2 spots	3 ·	-	-
SP-39	0-36	Brown sandy silt, moderately compacted		Redeposited/	None
		,, a, copasted			

SP	Depth				Artifact
Number	(cmbs)	Description	Comments	Origin	Presence
		with angular gravels		fill	
	36-48	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-40	0-28	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	28-50	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-41	0-32	Very dark brown silty fine to medium		Native	None
	-	sand, loose to moderately compacted		sediment	
	32-67	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-42	0-47	Very dark brown silty fine to medium		Native	None
	-	sand, loose to moderately compacted		sediment	
	47-70	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-43	0-36	Very dark brown silty fine to medium		Native	None
	-	sand, loose to moderately compacted		sediment	
	36-49	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-44	0-31	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	31-82	Grey and tan medium sand, moderately	Few gravels	Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-45	0-56	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	56-68	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-46	0-28	Very dark brown silty fine to medium		Native	None
	-	sand, loose to moderately compacted		sediment	
	28-56	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-47	0-38	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	38-82	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-48	0-40	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	40-63	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-49	0-41	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	41-64	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-50	0-39	Very dark brown silty fine to medium		Native	None

SP	Depth				Artifact
Number	(cmbs)	Description	Comments	Origin	Presence
		sand, loose to moderately compacted		sediment	
	39-81	Grey and tan medium sand, moderately	Grades to gray at	Glaciomarine	None
		compacted, mottled with FeO2 spots	base		
SP-51	0-29	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	29-37	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-52	0-42	Brown sandy silt, moderately compacted		Redeposited/	None
		with angular gravels		fill	
	42-57	Grey and tan medium sand, moderately		Glaciomarine	None
		compacted, mottled with FeO2 spots			
SP-53	0-36	Very dark brown silty fine to medium		Native	None
		sand, loose to moderately compacted		sediment	
	36-71	Tannish gray coarse sand, densely	Angular gravels	Glacial	None
		compacted with mottling			

Auger Probe Table

AP	Depth				Artifact
Number	(cmbs)	Description	Comments	Origin	Presence
AP-1	0-50	Brown to very dark brown, sandy organic		Lagoon peats	None
		fibrous peat, moderately compacted			
	50-130	Bluish gray fine to medium sand,		Coastal sands	None
		moderate to densely compacted			
AP-2	0-35	Brown to very dark brown, sandy organic		Lagoon peats	None
		fibrous peat, moderately compacted			
	35-100	Bluish gray fine to medium sand,		Coastal sands	None
		moderate to densely compacted			
AP-3	0-20	Brown to very dark brown, sandy organic		Lagoon peats	None
		fibrous peat, moderately compacted			
	20-80	Bluish gray fine to medium sand,		Coastal sands	None
		moderate to densely compacted			
AP-4	0-18	Brown to very dark brown, sandy organic		Lagoon peats	None
		fibrous peat, moderately compacted			
	18-85	Bluish gray fine to medium sand,		Coastal sands	None
		moderate to densely compacted			
AP-5	0-65	Brown to very dark brown, sandy organic		Lagoon peats	None
		fibrous peat, moderately compacted			
	65-85	Bluish gray fine to medium sand,		Coastal sands	None
		moderate to densely compacted			
AP-6	0-85	Brown to very dark brown, sandy organic		Lagoon peats	None
		fibrous peat, moderately compacted			

85-100	Bluish gray fine to medium sand,		Coastal sands	None
	moderate to densely compacted			
0-72	Brown to very dark brown, sandy organic		Lagoon peats	None
	fibrous peat, moderately compacted			
72-85	Grayish brown, fine silt, moderately			None
	compacted			
85-95	Bluish gray fine to medium sand,		Coastal sands	None
	moderate to densely compacted			
0-59	Brown to very dark brown, sandy organic		Lagoon peats	None
	fibrous peat, moderately compacted			
59-68	Bluish gray fine to medium sand,		Coastal sands	None
	moderate to densely compacted			
0-85	Brown to very dark brown, sandy organic		Lagoon peats	None
	fibrous peat, moderately compacted			
85-105	Bluish gray fine to medium sand,		Coastal sands	None
	moderate to densely compacted			
0-145	Brown to very dark brown, sandy organic		Lagoon peats	None
	fibrous peat, moderately compacted			
0-135	Brown to very dark brown, sandy organic	Clastic sediments	Lagoon peats	None
	fibrous peat, moderately compacted	felt at 135 cmbs		
0-120	Brown to very dark brown, sandy organic	Clastic sediments	Lagoon peats	None
	fibrous peat, moderately compacted	felt at 120 cmbs		
	0-72 72-85 85-95 0-59 59-68 0-85 85-105 0-145 0-135	moderate to densely compacted 0-72 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 72-85 Grayish brown, fine silt, moderately compacted 85-95 Bluish gray fine to medium sand, moderate to densely compacted 0-59 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 59-68 Bluish gray fine to medium sand, moderate to densely compacted 0-85 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 85-105 Bluish gray fine to medium sand, moderate to densely compacted 0-145 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 0-135 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 0-120 Brown to very dark brown, sandy organic	moderate to densely compacted 0-72 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 72-85 Grayish brown, fine silt, moderately compacted 85-95 Bluish gray fine to medium sand, moderate to densely compacted 0-59 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 59-68 Bluish gray fine to medium sand, moderate to densely compacted 0-85 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 85-105 Bluish gray fine to medium sand, moderate to densely compacted 0-145 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 0-135 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 0-120 Brown to very dark brown, sandy organic fibrous peat, moderately compacted Clastic sediments	moderate to densely compacted 0-72 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 72-85 Grayish brown, fine silt, moderately compacted 85-95 Bluish gray fine to medium sand, moderate to densely compacted 0-59 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 59-68 Bluish gray fine to medium sand, moderate to densely compacted 0-85 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 85-105 Bluish gray fine to medium sand, coastal sands moderate to densely compacted 85-105 Bluish gray fine to medium sand, moderate to densely compacted 0-145 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 0-135 Brown to very dark brown, sandy organic fibrous peat, moderately compacted 0-120 Brown to very dark brown, sandy organic filt at 135 cmbs Clastic sediments felt at 135 cmbs Clastic sediments Lagoon peats

Appendix C

Unanticipated Discovery Plan

Appendix C

Unanticipated Discovery Plan

This document outlines the procedures for dealing with the unanticipated discovery of human skeletal remains or cultural resources during the Orcas Island Airport Improvement Project, on Orcas Island, San Juan County, Washington.

- A. If any employee of the Port of Orcas Island (Port) or any of the contractors or subcontractors believes that he or she has made an unanticipated discovery of human skeletal remains or cultural resources, all work adjacent to the discovery shall cease. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the discovery, in accordance with Washington State Law. The Port project manager (#1) will be contacted.
- B. The Port project manager will be responsible for taking appropriate steps to protect the discovery. At a minimum, the immediate area will be secured to a distance of 30 feet from the discovery. Vehicles, equipment, and unauthorized personnel will not be permitted to traverse the discovery site.
- C. If skeletal remains are discovered, the Port project manager will contact a cultural resource specialist or consultant qualified to identify human skeletal remains. If the remains are identified as non-human or faunal, then work can continue without interruption. If the evaluation of the remains is inconclusive or positively identifies them as human, then the Port project manager will immediately contact the San Juan County Coroner (#2) and the San Juan County Sherriff's office (#3). The Port project manager will also contact the Federal Aviation Administration Lead (#4) and provide notice of the discovery. The county coroner will determine if the remains are forensic (related to a modern crime) or non-forensic. The remains should be protected in place until this has been determined. Any human skeletal remains that are discovered during this project will be treated with dignity and respect.
- D. If the human skeletal remains are determined to be non-forensic, the San Juan County Coroner will notify the Washington State Department of Archaeology and Historic Preservation (#5) (DAHP). Following RCW 43.334.075, DAHP will take jurisdiction over the remains. The State Physical Anthropologist will make a determination of whether the remains are Native American or Non-Native American. DAHP will identify the affected tribes and handle all consultation with the tribes as to the treatment of the remains.
- E. If cultural resources are uncovered, such as stone tools or flakes, fire-cracked rocks from a hearth feature, butchered animal bones, or historic-era objects (e.g., patent medicine bottles, milk tins, clay pipes, building foundations), the Port project manager will arrange for a qualified professional archaeologist to evaluate the find. The Port project manager will contact the Federal Aviation Administration Lead (#5), who will contact the affected tribes (#6 #9) and consult with the Washington Department of Archaeology and Historic Preservation (DAHP) concerning the nature and extent of the discovery. Ground disturbing excavations shall not continue at the location of the discovery until approval is obtained from the Port project manager after the appropriate consultation between the FAA, DAHP, and affected tribes has occurred. Ground disturbing excavations may resume within 30-feet of the discovery, if monitored by an archaeologist.

Port of Orcas Island Airport Appendix C

CONTACT INFORMATION

1. Tony Simpson, Airport/Project Manager

Port of Orcas Island

POB 53

Eastsound, WA 98245-0053

Phone: (360) 376-5285

2. San Juan County Coroner – Prosecuting Attorney's Office

350 Court Street - 2nd Floor

Friday Harbor, WA 98250

Phone: (360) 378-4101

3. San Juan County Sherriff's Office Main Office

96 Second Street

Friday Harbor, WA 98250

Phone: (360) 378-4151 (non-emergency)

4. Cayla Morgan

Environmental Protection Specialist

Seattle Airports District Office

Federal Aviation Administration

Phone: (425) 227-2653

5. Dr. Guy Tasa

State Physical Anthropologist

Department of Archaeology and Historic Preservation

PO Box 48343

1063 Capitol Way South

Olympia, WA 98504-8343

Phone: (360) 586-35345

6. Lummi Nation

Lena Tso, THPO

2665 Kwina Road

Bellingham, WA 98226-9298

Phone: (360) 312-2257

7. Samish Indian Nation

Jackie Ferry, THPO

2918 Commercial Ave.

Anacortes, WA 98221

Phone: (360) 293-6404, ext. 126

Port of Orcas Island Airport Appendix C

8. Upper Skagit Tribe Scott Schuyler, Cultural Resources 25944 Community Plaza Sedro Woolley, WA 98284 Phone: (360) 854-7009

Larry Campbell - THPO

Swinomish Indian Tribal Community
 Josephine Peters, Cultural Resources Technician
 Cultural Resource Protection Office
 11430 Moorage Way
 La Conner, WA 98257-8707
 Phone: (360) 466-7352

Appendix E Department of Archeology & Historic Preservation and Tribal Consultation Letters



March 17, 2015

Mr. Matthew Sterner, Transportation Archaeologist Washington State Department of Archaeology and Historic Preservation 1110 S. Capitol Way, Suite 30 Olympia, WA 98501

> Proposed Improvements to Orcas Island Airport Orcas Island, Washington

Dear Mr. Sterner:

The Federal Aviation Administration (FAA) would like to initiate consultation with you in accordance with Section 106 of the National Historic Preservation Act of 1966, and implementing regulations 36 CFR Part 800 for the aforementioned project.

A Cultural Resources Survey was prepared by ICF International. ICF archaeologists designed and performed a cultural resources survey of the APE using standard Department of Archaeology and Historic Preservation – accepted methods. Three approaches to field investigations were used: (1) pedestrian survey, (2) subsurface investigations, and (3) a reconnaissance-level historic built resource survey.

No cultural resources were identified during the survey of the proposed APE and the project is not expected to adversely affect NRHP-eligible resources. Based upon these results, a finding of "no historic properties" is recommended for the project. However, since the APE is in the vicinity of a documented precontact archaeological site, the use of an unanticipated discovery plan which is included in Appendix C of the report is recommended.

We have enclosed a copy of the report for your review and seek your concurrence with the finding of "no historic properties affected". Should you have any questions or wish to discuss aspects of the project in further detail, please do not hesitate to contact me at (425) 227-2653.

Sincerely

Cayla D. Morgan

Environmental Protection Specialist Seattle Airports District Office

Enclosure

cc: Anthony Simpson, Orcas Island Airport Manager Lena Tso, Lummi Tribe Jackie Ferry, Samish Indian Nation Scott Schuyler, Upper Skagit Tribe Josephine Peters, Swinomish Indian Tribal Community



March 17, 2015

Ms. Lena Tso, THPO Lummi Nation 2665 Kwina Road Bellingham, WA 98226

> Proposed Improvements to Orcas Island Airport Orcas Island, Washington

Dear Ms. Tso:

The Federal Aviation Administration (FAA) would like to initiate consultation with you in accordance with Section 106 of the National Historic Preservation Act of 1966, and implementing regulations 36 CFR Part 800 for the aforementioned project. We are also initiating consultation in accordance with Executive Order 13175, Consultation and Coordination with Indian and Tribal Governments and FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures.

A Cultural Resources Survey was prepared by ICF International. ICF archaeologists designed and performed a cultural resources survey of the APE using standard Department of Archaeology and Historic Preservation – accepted methods. Three approaches to field investigations were used: (1) pedestrian survey, (2) subsurface investigations, and (3) a reconnaissance-level historic built resource survey.

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Sincerely,

Cayla D. Molean
Environmental Protection Specialist
Seattle Airports District Office

Enclosure

cc: Anthony Simpson, Orcas Island Airport Manager Matthew Sterner, Department of Archaeology and Historic Preservation Jackie Ferry, Samish Indian Nation Scott Schuyler, Upper Skagit Tribe Josephine Peters, Swinomish Indian Tribal Community



March 17, 2015

Ms. Jackie Ferry, THPO Samish Indian Nation 2918 Commercial Avenue Anacortes, WA 98221

> Proposed Improvements to Orcas Island Airport Orcas Island, Washington

Dear Ms. Ferry:

The Federal Aviation Administration (FAA) would like to initiate consultation with you in accordance with Section 106 of the National Historic Preservation Act of 1966, and implementing regulations 36 CFR Part 800 for the aforementioned project. We are also initiating consultation in accordance with Executive Order 13175, Consultation and Coordination with Indian and Tribal Governments and FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures.

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Sincerely

Cayla D. Morgan

Environmental Protection Specialist Seattle Airports District Office

Enclosure

cc: Anthony Simpson, Orcas Island Airport Manager Matthew Sterner, Department of Archaeology and Historic Preservation Lena Tso, Lummi Nation Scott Schuyler, Upper Skagit Tribe Josephine Peters, Swinomish Indian Tribal Community



March 17, 2015

Ms. Josephine Peters, Cultural Resources Swinomish Indian Tribal Community 11430 Moorage Way La Conner, WA 98257-8707

> Proposed Improvements to Orcas Island Airport Orcas Island, Washington

Dear Ms. Peters:

The Federal Aviation Administration (FAA) would like to initiate consultation with you in accordance with Section 106 of the National Historic Preservation Act of 1966, and implementing regulations 36 CFR Part 800 for the aforementioned project. We are also initiating consultation in accordance with Executive Order 13175, Consultation and Coordination with Indian and Tribal Governments and FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures.

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Sincerely,

Environmental Protection Specialist Seattle Airports District Office

Enclosure

cc: Anthony Simpson, Orcas Island Airport Manager Matthew Sterner, Department of Archaeology and Historic Preservation Lena Tso, Lummi Nation Jackie Ferry, Samish Indian Nation Scott Schuyler, Upper Skagit Tribe



March 17, 2015

Mr. Scott Schuyler, Cultural Resources Upper Skagit Tribe 25944 Community Plaza Sedro Woolley, WA 98284

> Proposed Improvements to Orcas Island Airport Orcas Island, Washington

Dear Mr. Schuyler:

The Federal Aviation Administration (FAA) would like to initiate consultation with you in accordance with Section 106 of the National Historic Preservation Act of 1966, and implementing regulations 36 CFR Part 800 for the aforementioned project. We are also initiating consultation in accordance with Executive Order 13175, Consultation and Coordination with Indian and Tribal Governments and FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures.

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Sincerely

Cayla D. Morgan
Environmental Protection Specialist
Seattle Airports District Office

Enclosure

cc: Anthony Simpson, Orcas Island Airport Manager Matthew Sterner, Department of Archaeology and Historic Preservation Lena Tso, Lummi Nation Jackie Ferry, Samish Indian Nation Josephine Peters, Swinomish Indian Tribal Community



Prepared by:

WHPacific, Inc.

12100 NE 195th St, Ste 300 Bothell, Washington 98011 (425) 951-4800