



Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

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COMPENSATORY WETLAND MITIGATION PLAN
FOR
ORCAS ISLAND AIRPORT
2016 RUNWAY AND TAXIWAY IMPROVEMENTS

Wetland Resources, Inc. Project #12225

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For:

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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
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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.

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.

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 (*Alopecurus 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 armeniacus*), 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 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 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
B	PFOC	Slope	Category III
C	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 townsendii*), 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 (*Parus atricapillus*), bushy tit (*Psaltriparus minimus*), northern flicker (*Colaptes auratus*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*Dendrocopos 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 deer, 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 its 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**

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.

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 rationale 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*

- **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

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 parent 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 (*Symphoricarpos albus*), Himalayan blackberry (*Rubus armeniacus*), bentgrass (*Agrostis tenuis*) as well as tall fescue (*Festuca arundinacea*), reed canarygrass (*Phalaris arundinacea*), Canada thistle (*Cirsium 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 canarygrass 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	<i>Picea sitchensis</i>	1 gal	15'	110
Shore Pine	<i>Pinus contorta</i>	1 gal	15'	110
Western red cedar	<i>Thuja plicata</i>	1 gal	15'	90
Western crabapple	<i>Malus fusca</i>	1 gal	15'	90
Red alder	<i>Alnus rubra</i>	1 gal	15'	90
Red osier dogwood	<i>Cornus sericea</i>	1 gal	6'	385
Pacific willow	<i>Salix lucida</i>	1 gal	6'	385
Hooker's willow	<i>Salix hookeriana</i>	1 gal	6'	385
Black twinberry	<i>Lonicera involucrata</i>	1 gal	6'	385
Nootka rose	<i>Rosa nutkana</i>	1 gal	6'	260
Pacific ninebark	<i>Physocarpus catitatus</i>	1 gal	6'	260
Salmonberry	<i>Rubus spectabilis</i>	1 gal	6'	260
Black hawthorn	<i>Crataegus douglasii</i>	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	<i>Pinus contorta</i>	1 gal	15'	240
Red alder	<i>Alnus rubra</i>	1 gal	15'	180
Sitka spruce	<i>Picea sitchensis</i>	1 gal	15'	150
Western crabapple	<i>Malus fusca</i>	1 gal	15'	150
Western red cedar	<i>Thuja plicata</i>	1 gal	15'	100
Nootka rose	<i>Rosa nutkana</i>	1 gal	8'	800
Hooker's willow	<i>Salix hookeriana</i>	1 gal	8'	800
Black twinberry	<i>Lonicera involucrata</i>	1 gal	8'	480

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

Common Name	Latin Name	Size	Spacing	Quantity
Sitka spruce	<i>Picea sitchensis</i>	1 gal	15'	124
Western red cedar	<i>Thuja plicata</i>	1 gal	15'	124
Shore Pine	<i>Pinus contorta</i>	1 gal	15'	70
Western crabapple	<i>Malus fusca</i>	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	<i>Thuja plicata</i>	1 gal	15'	96
Douglas fir	<i>Picea sitchensis</i>	1 gal	15'	96
Red alder	<i>Alnus rubra</i>	1 gal	15'	88
Snowberry	<i>Symphoricarpus albus</i>	1 gal	6'	440
Nootka rose	<i>Rosa nutkana</i>	1 gal	6'	440
Douglas hawthorn	<i>Crataegus douglasii</i>	1 gal	6'	200
Salmonberry	<i>Rubus spectabilis</i>	1 gal	6'	360
Sword fern	<i>Polystichum munitum</i>	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, UTM's, 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

Cowardin, et al., 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S.D.I. Fish and Wildlife Service. FWS/OBS-79/31. December 1979.

Hruby, T. (2014). *Washington State Wetland Rating System for Western Washington: 2014 Update*. (Publication #14-06-029). Olympia, WA: Washington Department of Ecology.

Mueller-Dombois, Dieter and Heinz Ellenberg. 1974. *Aims and Methods of Plant Vegetation Ecology*. John Wiley & Sons Inc. New York, New York.

National List of Plant Species that Occur in Wetlands, Northwest Region. 1996. U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C.

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.

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

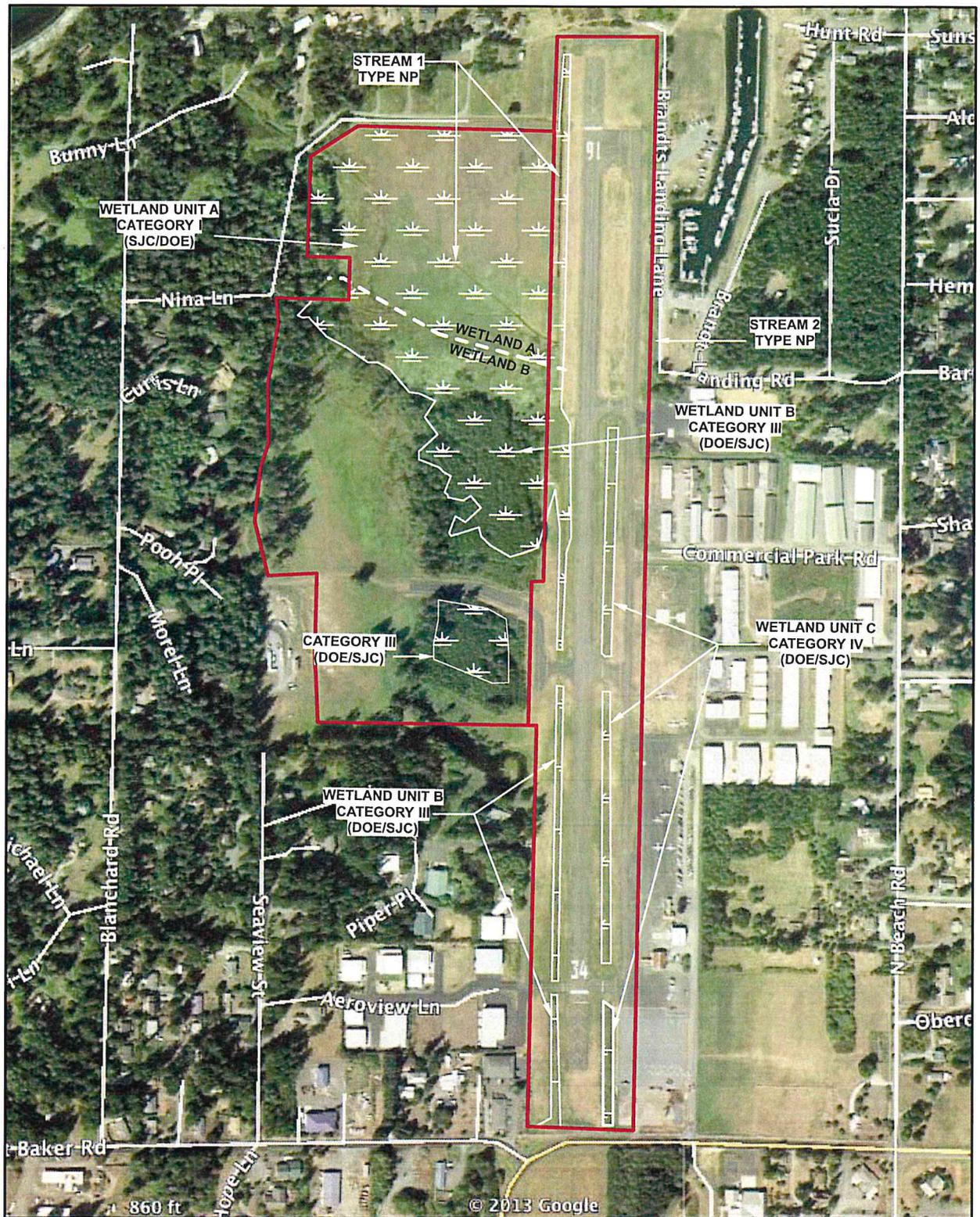
APPENDIX A: FIGURES, PHOTOS AND CHARTS

- 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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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.

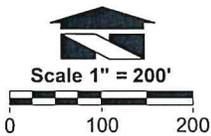
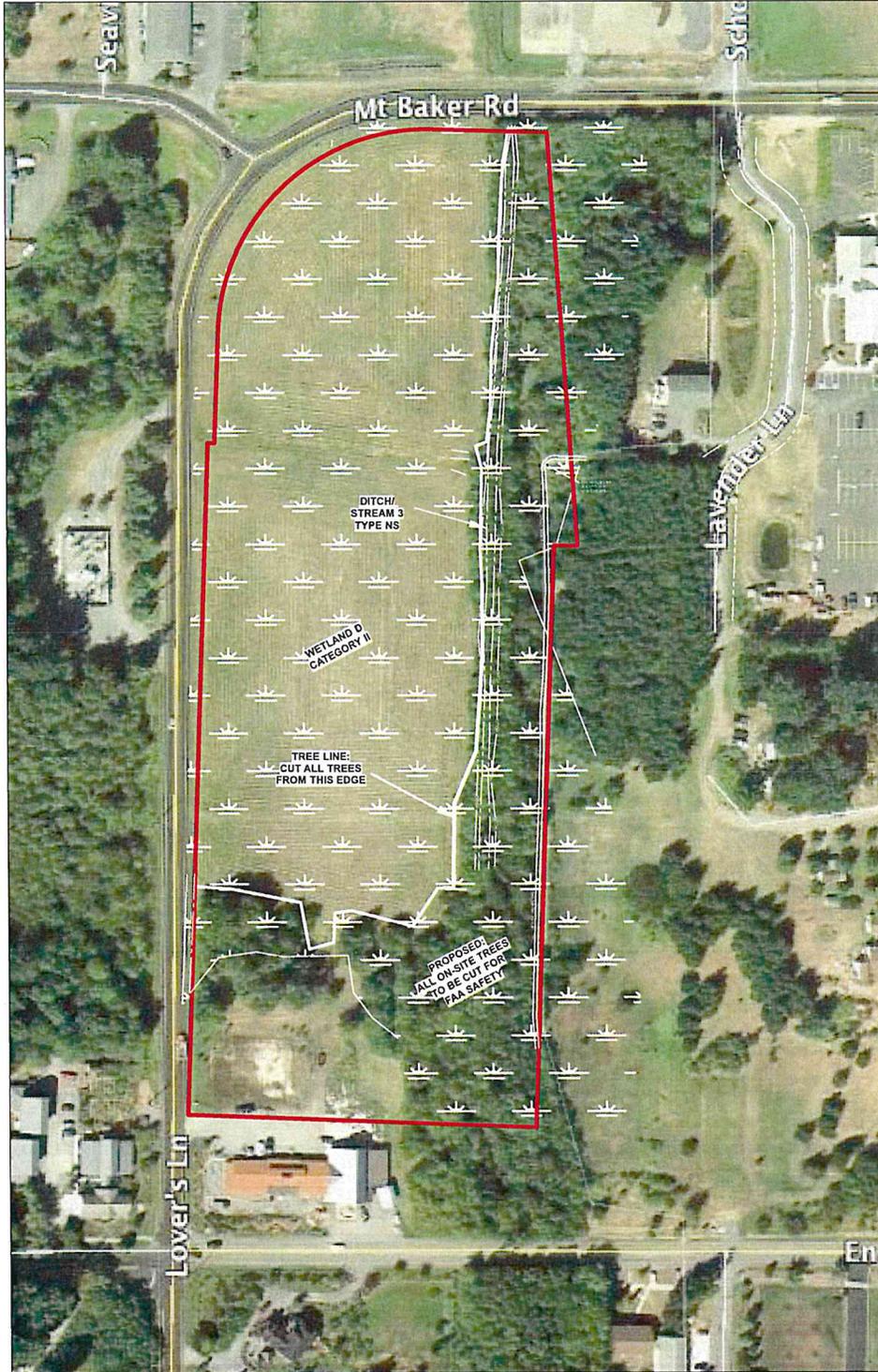
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APPLICANT:
 Port of Orcas
 c/o WH Pacific
 Attn: Flannan Tam
 12100 NE 195th St., #300
 Bothell, WA 98011

IN: WR1A 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

IN: WRIA 2
 AT: 147 Schoen Ln, Eastsound, WA 98245

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

FIGURE 3: CONCEPTUAL MITIGATION PLAN

ORCAS ISLAND AIRPORT

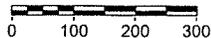
Section 11, Township 37N, Range 2W, W.M.

Latitude: 48.706192

Longitude: -122.907186



Scale 1" = 300'



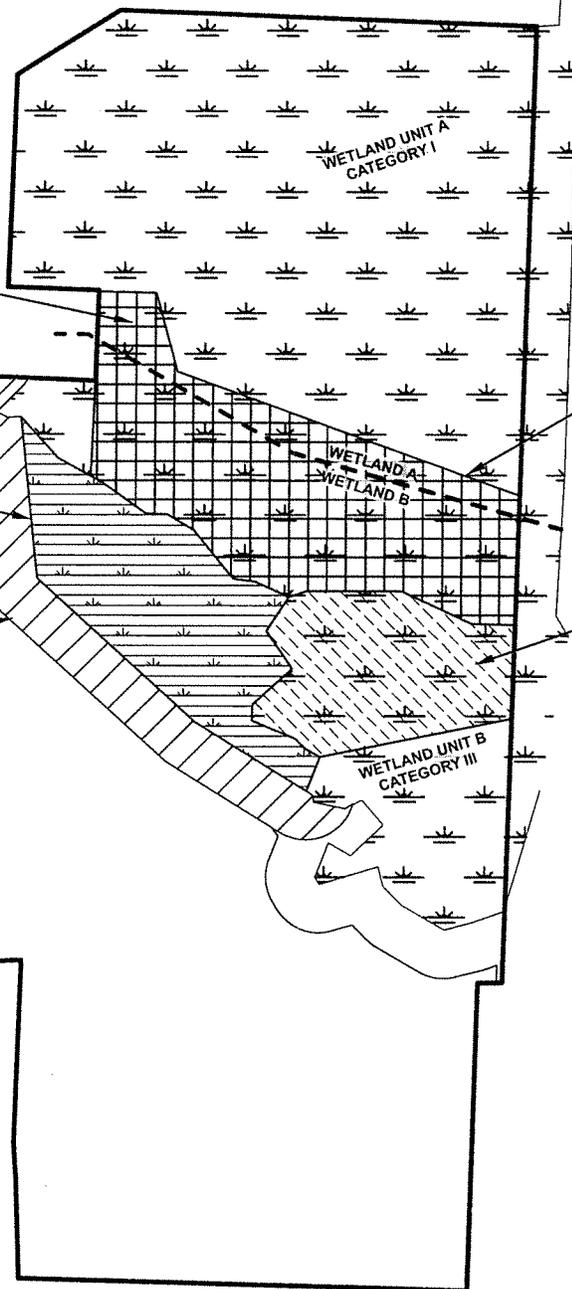
WETLAND
ENHANCEMENT
AREA 1
4.2 ACRES

WETLAND
CREATION
2.54 ACRES

BUFFER
ENHANCEMENT
1.4 ACRES

HYDROGEOMORPHIC
& VEGETATIVE BREAK
BETWEEN
WETLAND UNIT A &
WETLAND UNIT B

WETLAND
ENHANCEMENT
AREA 2
2.0 ACRES



LEGEND

	WETLAND ENHANCEMENT AREA 1
	WETLAND ENHANCEMENT AREA 2
	WETLAND CREATION
	BUFFER ENHANCEMENT
	WETLAND AREAS

PURPOSE:

Orcas Island Airport Improvements Project:
To improve airport facility, operations and to
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DATUM: NAVD88

APPLICANT:

Port of Orcas
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Attn: Flannan Tam
12100 NE 195th St., #300
Bothell, WA 98011

IN: WRIA 2

AT: 147 Schoen Ln, Eastsound, WA 98245

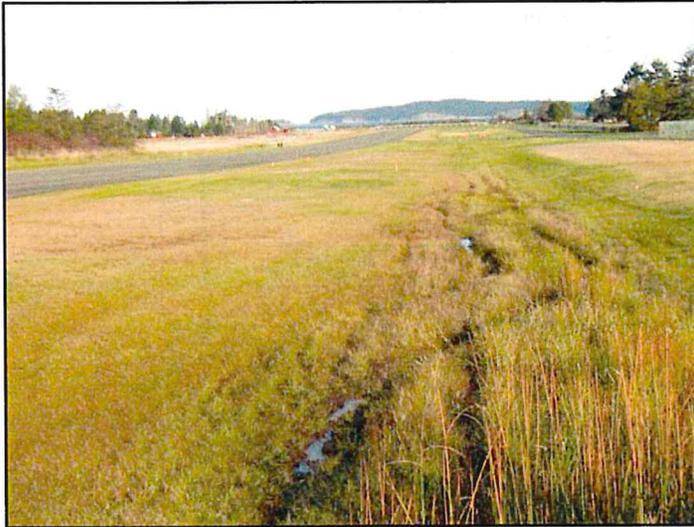
COUNTY: San Juan

STATE: Washington

Figure 3

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)

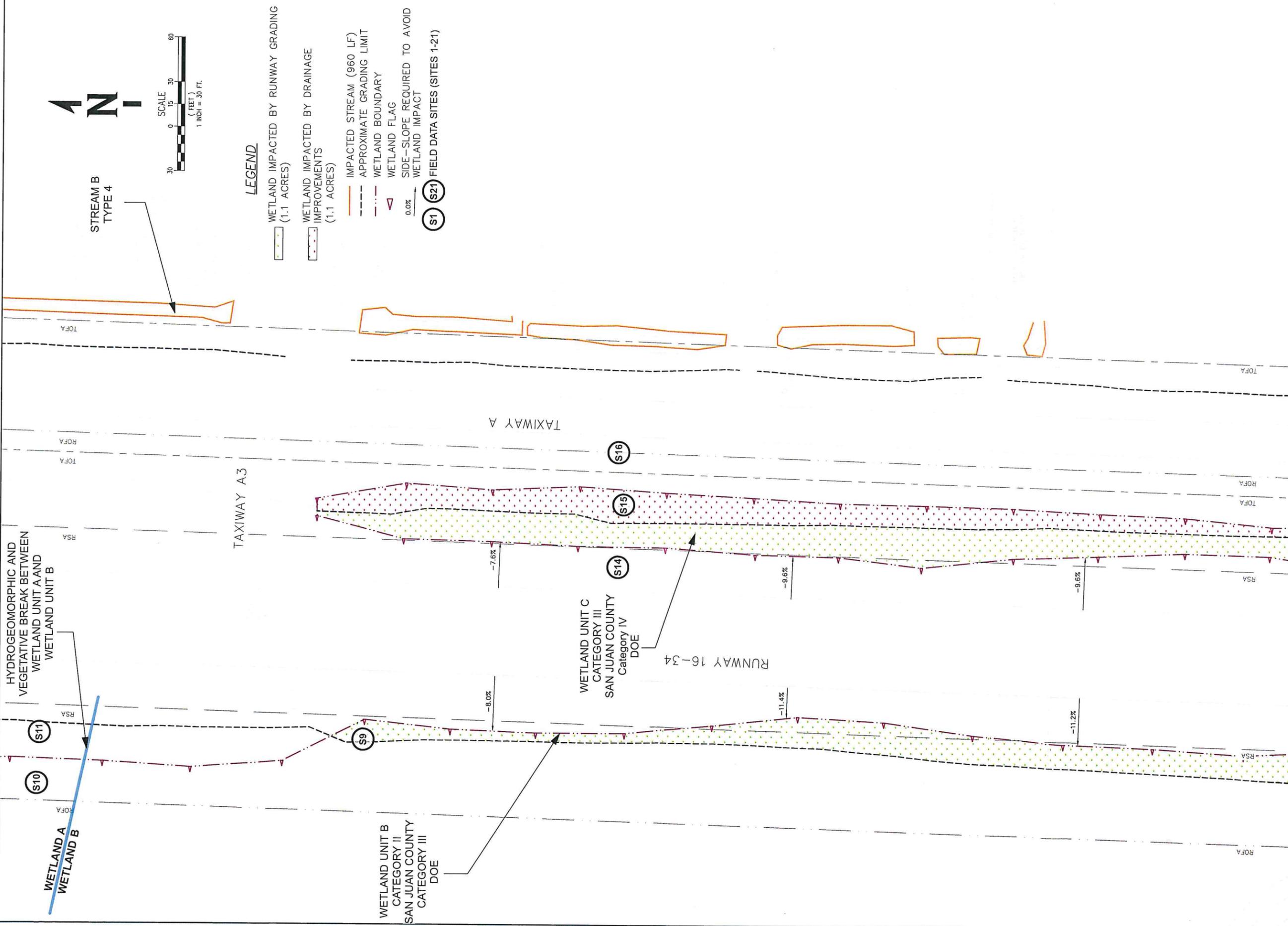


PHOTO 4: VIEW LOOKING SOUTHWEST AT THE WETLAND ENHANCEMENT AREA IN WETLAND A



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

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LEGEND

- WETLAND IMPACTED BY RUNWAY GRADING (1.1 ACRES)
- WETLAND IMPACTED BY DRAINAGE IMPROVEMENTS (1.1 ACRES)
- IMPACTED STREAM (960 LF)
- APPROXIMATE GRADING LIMIT
- WETLAND BOUNDARY
- WETLAND FLAG
- 0.0% SIDE-SLOPE REQUIRED TO AVOID WETLAND IMPACT
- FIELD DATA SITES (SITES 1-21)

SHEET NUMBER

2 of 4

ORCAS ISLAND AIRPORT
 EXHIBIT 3: POTENTIAL WETLAND IMPACT AREAS
 PORT OF ORCAS

PROJECT NUMBER: 37367
 DRAWING FILE NAME: WETLAND IMPACT AREA_2013.02.27.B
 SCALE: 1" = 30'

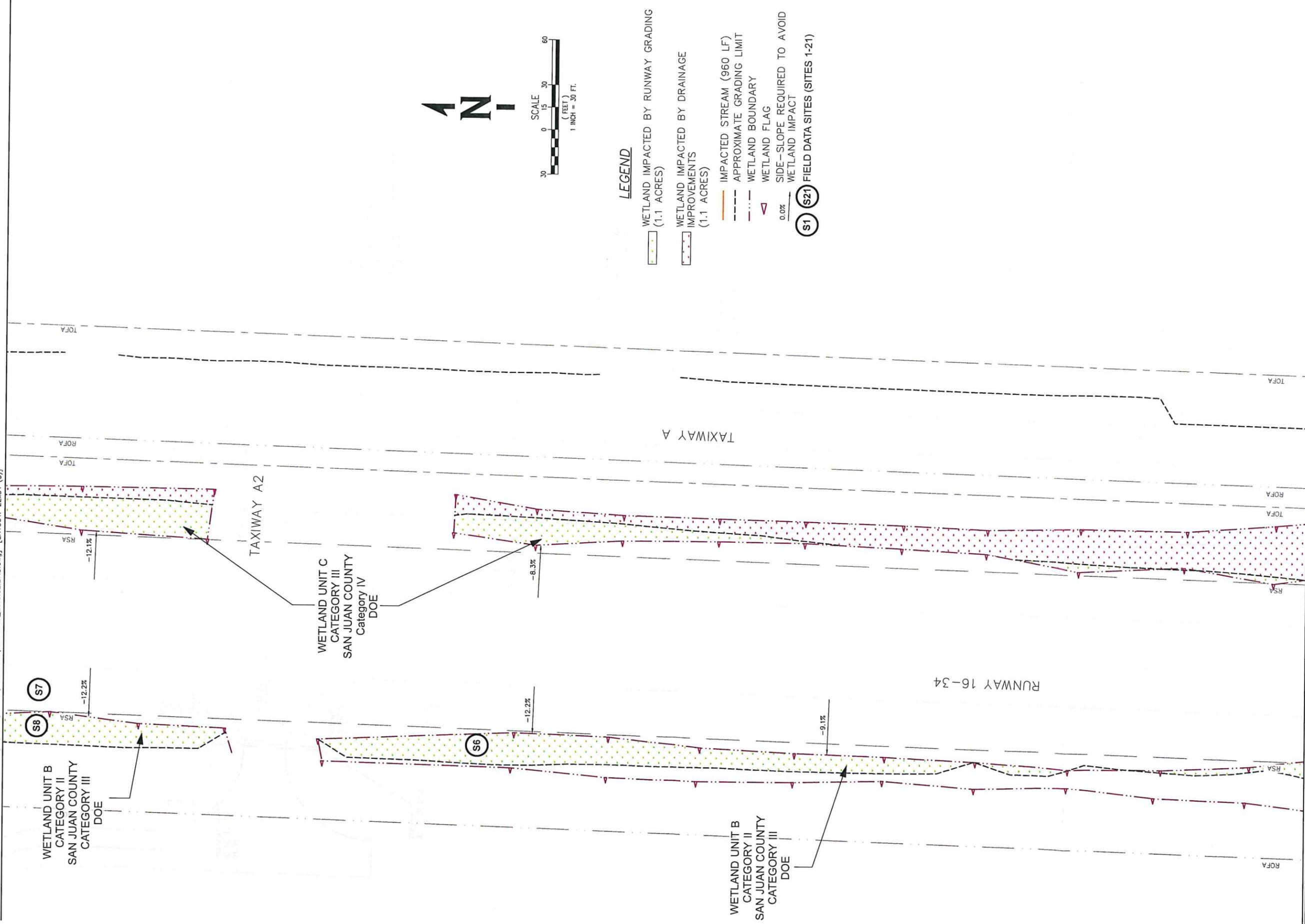
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APPROVED	DSW
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PLOT DATE	2/27/2013
SUBMITTAL	

REVISIONS		
NO.	BY	DATE

NO.	BY	DATE	REMARKS



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LEGEND

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- WETLAND IMPACTED BY DRAINAGE IMPROVEMENTS (1.1 ACRES)
- IMPACTED STREAM (960 LF)
- APPROXIMATE GRADING LIMIT
- WETLAND BOUNDARY
- WETLAND FLAG
- 0.0% SIDE-SLOPE REQUIRED TO AVOID WETLAND IMPACT
- S1 S21 FIELD DATA SITES (SITES 1-21)

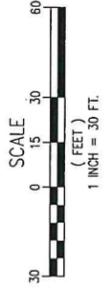
**ORCAS ISLAND AIRPORT
EXHIBIT 3: POTENTIAL WETLAND IMPACT AREAS
PORT OF ORCAS**

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APPROVED	DSW			
LAST EDIT	2/27/2013			
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SUBMITTAL				

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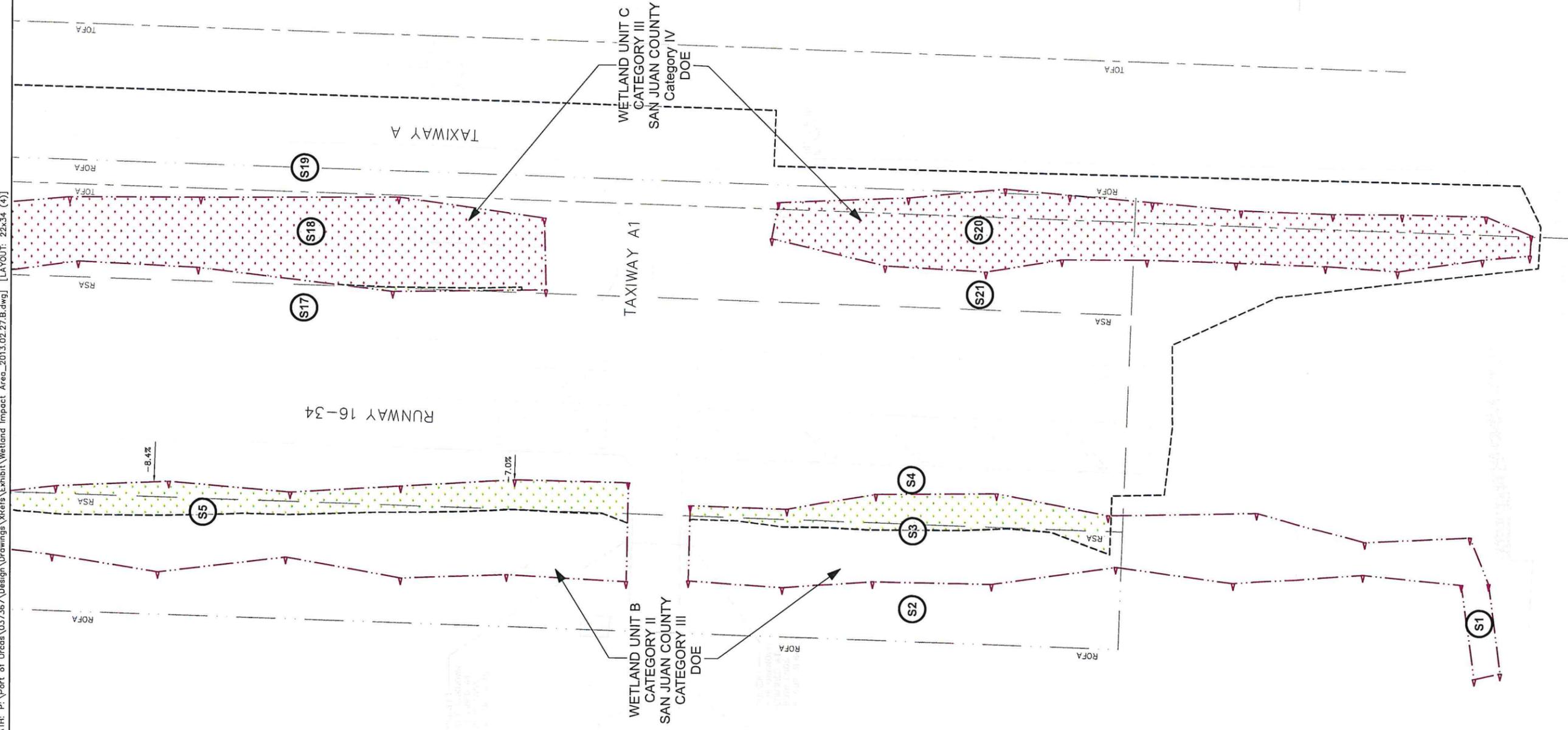


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LEGEND

- WETLAND IMPACTED BY RUNWAY GRADING (1.1 ACRES)
 - WETLAND IMPACTED BY DRAINAGE IMPROVEMENTS (1.1 ACRES)
 - IMPACTED STREAM (960 LF)
 - APPROXIMATE GRADING LIMIT
 - WETLAND BOUNDARY
 - WETLAND FLAG
 - SIDE-SLOPE REQUIRED TO AVOID WETLAND IMPACT
 - S1
 - S21
- FIELD DATA SITES (SITES 1-21)



**ORCAS ISLAND AIRPORT
EXHIBIT 3: POTENTIAL WETLAND IMPACT AREAS
PORT OF ORCAS**

SHEET NUMBER
4 of 4

PROJECT NUMBER: 37367
DRAWING FILE NAME: WETLAND IMPACT AREA_2013.02.27.B
SCALE: 1" = 30'

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APPROVED	DSW		
LAST EDIT	227/2013		
PLOT DATE	227/2013		
SUBMITTAL			



**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 in the hydrologic unit	Yes	No	In watershed plan?
Increased flooding	X		No
Eutrophication in streams, rivers, and lakes		X	
Impaired water quality		X	
Erosion of streams and river banks that threaten human and natural resources		X	
Fragmentation and loss of habitat	X		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 hydrogeomorphic (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 3: Analyzing the Potential of Sites to Provide Sustainable Mitigation in a Watershed Context

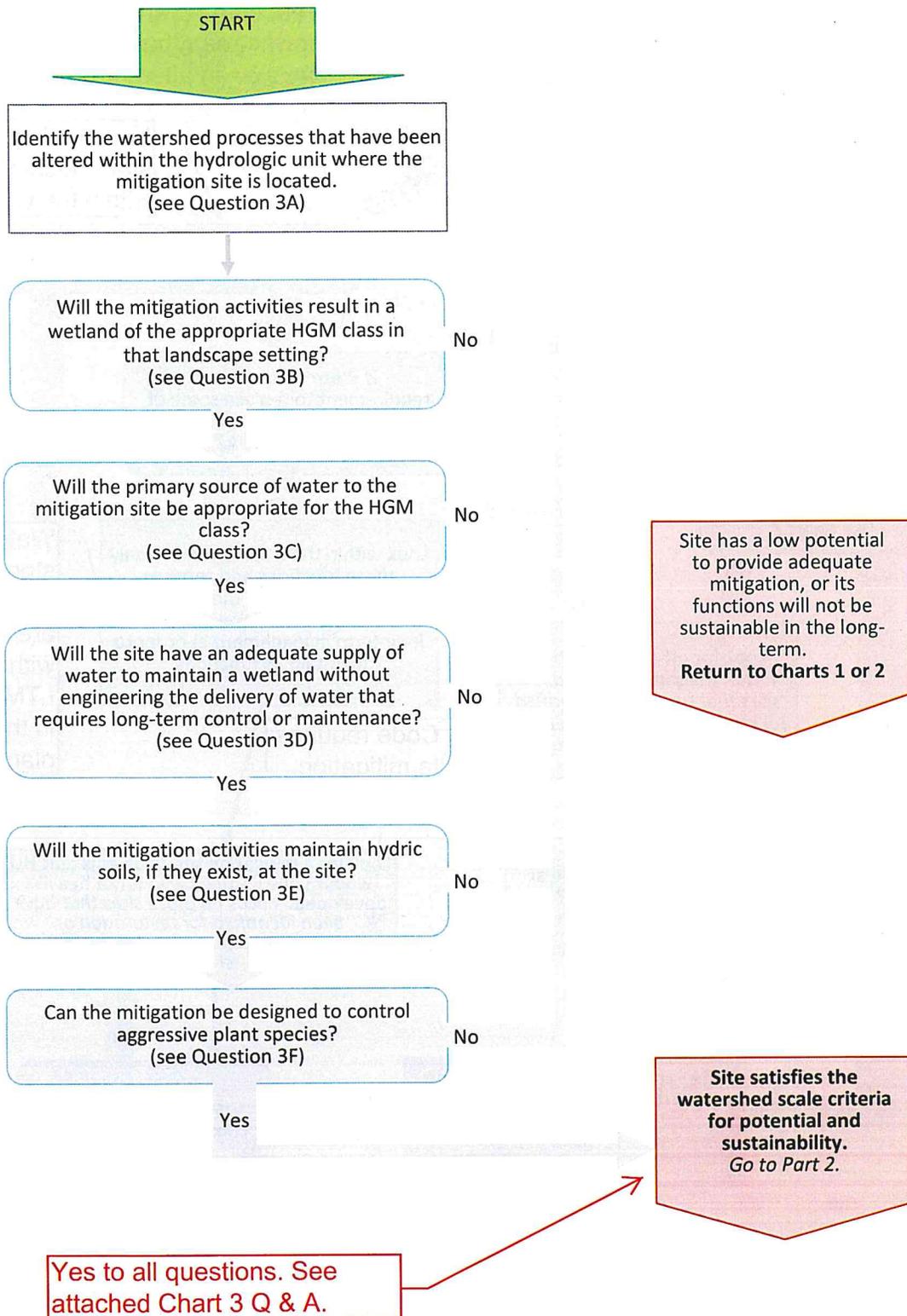
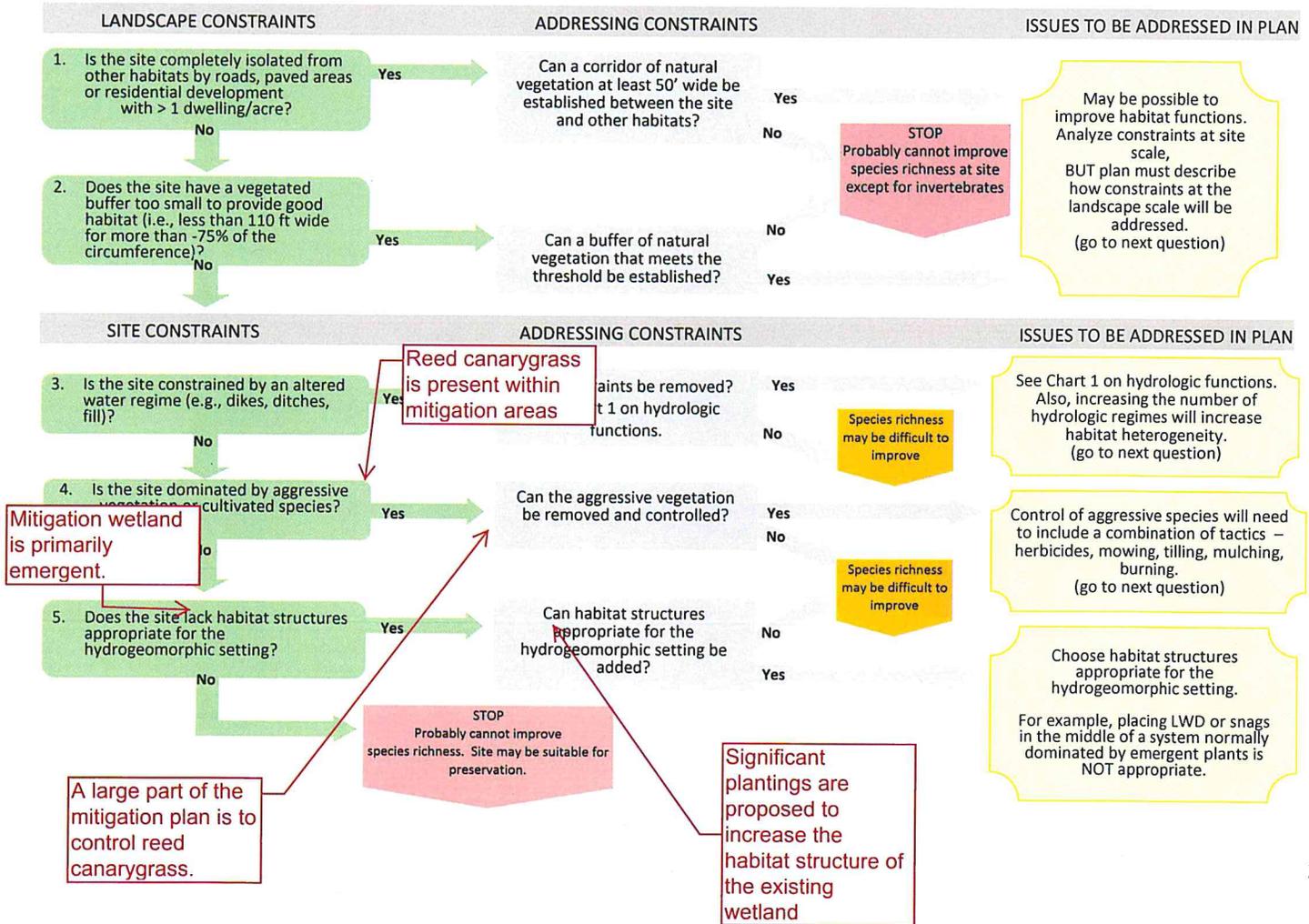


Chart 10: Goal - Improving Species Richness of Wildlife



APPENDIX B: DELINEATION REPORT