EXHIBIT 4

CRITICAL AREAS REPORT:
WETLANDS & HABITAT CONSERVATION AREAS FOR QUEEN MOUNTAIN PLAT

Bellingham, Washington

for
Singh Enterprises, LLC

January 29, 2021

Project No. 190012

MILLER
ENVIRONMENTAL
SERVICES, LLC

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January 29, 2021

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Ed Miller is a senior biologist and co-owner of Miller Environmental Services, LLC, who specializes in wetlands, wildlife, and habitat assessments. He is a Society of Wetland Scientists certified Professional Wetland Scientist (PWS), #1895. Mr. Miller obtained a Bachelor of Science in Terrestrial Ecology from Western Washington University in 1993 and a Masters of Environmental Science and Management with a focus on Watershed Management at the University of California at Santa Barbara in 2000. His experience includes preparing wetland delineations and reports, wetland functional assessments, stream and shoreline ordinary high water mark determinations, habitat conservation area reports, mitigation design, mitigation monitoring and floodplain habitat assessments for FEMA Endangered Species Act compliance. Mr. Miller has completed project permitting and compliance for agencies including U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, Washington Department of Ecology.

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Disclaimer

This report and wetland and/or stream delineation, is based on protocols that are described and defined in manuals and publications utilized by Federal, State, and Local agencies. The wetland delineation methodology used is consistent with the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997), the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps, 2010), and subsequent Corps guidance. Completed work is based on conditions at the time of the site visit. No guarantees are given that a delineation determination or assessment will concur exactly with those performed by regulatory agencies or by other qualified professionals.

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1.0 INTRODUCTION

At the request of the applicant, Singh Enterprises, LLC, Miller Environmental Services, LLC (MES) conducted a wetland delineation on a project site consisting of one parcel (parcel # 380308-449210) located at the north end of Iron Gate Road in Bellingham, Washington; Section 8, Township 38 N, Range 3 E, W.M. The project location is shown below on **Figure 1**. A map of the property and critical areas is included as **Appendix A**.

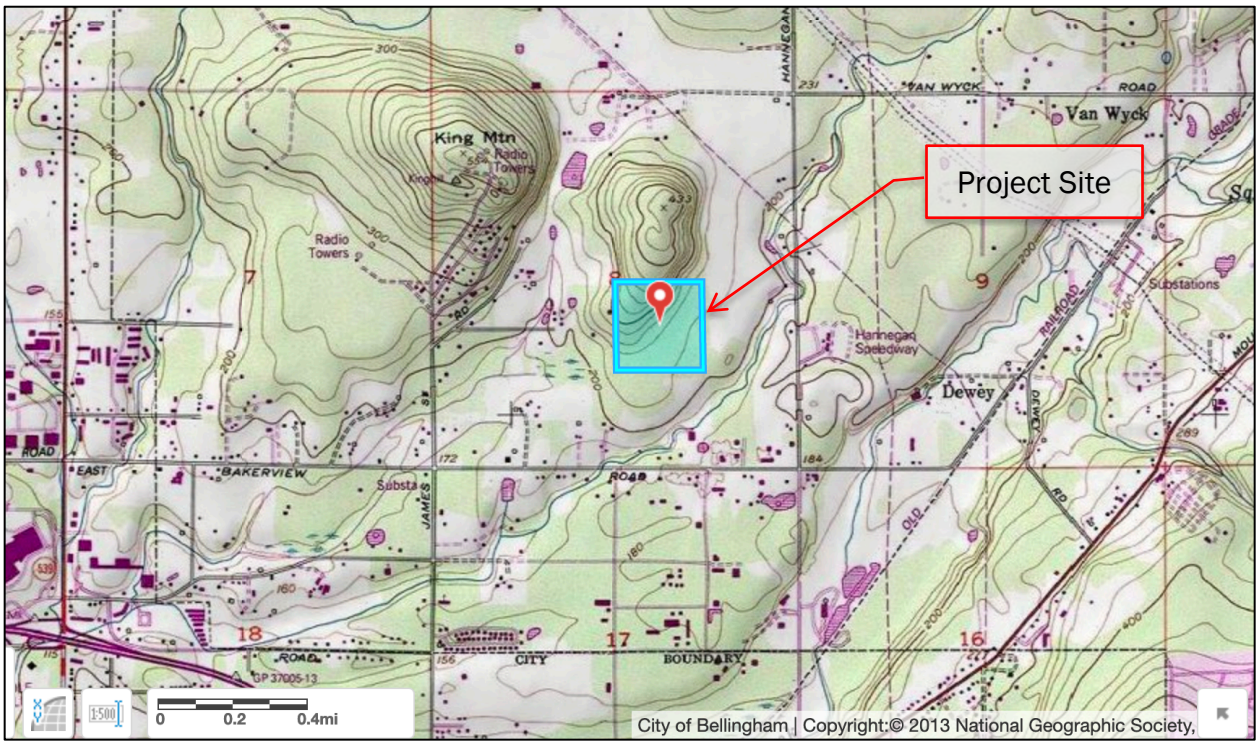
The applicant is proposing to construct approximately 75 residential homes with associated roads, stormwater collection and infrastructure. The development will be accessed off of Irongate Road, located south of the property.

This report presents the best professional judgment of MES in estimating the subject jurisdictional boundaries using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. However, only the regulatory agencies can make a final determination of jurisdictional boundaries.

1.1 PURPOSE

This Critical Areas Report was conducted as required within the 2016 City of Bellingham Critical Areas Ordinance [Bellingham Municipal Code (BMC) 16.55]. This report documents the location and nature of critical areas (wetlands and fish and wildlife habitat conservation areas) on the project site.

Figure 1: Vicinity Map



2.0 METHODS

2.1 PRELIMINARY RESEARCH

Published information about local conditions was reviewed for known critical area occurrences in the project vicinity. The information reviewed included:

- *National Wetlands Inventory (NWI*), *Wetlands Mapper*, United States Fish and Wildlife Service (USFWS);
- *Priority Habitats and Species Mapper,* Washington State Department of Fish and Wildlife (WDFW);
- *SalmonScape Mapper,* WDFW;
- *City of Bellingham CityIQ,* City of Bellingham;
- *Web Soil Survey,* United States Department of Agriculture, Natural Resource Conservation Service (NRCS); and
- *National Map Viewer,* United States Geological Survey (USGS).

2.2 FIELD INVESTIGATION

A site investigation of the property was conducted on April 23, 2019; March 1, 2019; May 1, 2019; and May 7, 2019 to document site conditions and delineate wetlands. This included a wetland delineation and an assessment of onsite habitat. Wetland boundaries and data plot locations were flagged and located by professional land surveyors. Site photographs taken during the site visit are included within **Appendix B**.

Wetlands were identified on the basis of hydrophytic vegetation, hydric soils, and evidence of wetland hydrology as described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987), *Corps Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (U.S. Army Corps of Engineers, 2010), and subsequent U.S. Army Corps of Engineers (Corps) guidance.

Hydrophytic vegetation (i.e., plants adapted to saturated soil conditions) was determined to be present when dominant cover of plants observed (greater than 50 percent) had an indicator status of facultative (FAC), facultative wetland (FACW), or obligate wetland (OBL). Plant species on-site were identified according to Cooke (1997), Pojar and MacKinnon (1994), and Hitchcock and Cronquist (1973). Plant indicator status was determined using the *Western Mountains, Valleys, and Coast 2012 Final Regional Wetland Plant List* (Lichvar, 2016).

Hydric soils were determined according to the methodology in the *Field indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils, Version 8.1* (USDA NRCS, 2017).

Wetland hydrology was determined through the observation of soil saturation, surface ponding, or other primary and secondary indicators such as water marks, drift deposits, iron deposits, surface cracks, water-stained leaves, drainage patterns, etc. (U.S. Army Corps of Engineers, 2010). Data were collected on vegetation, soils, and hydrology at each data plot and recorded on data forms (**Appendix C**).

2.3 WETLAND CLASSIFICATION AND FUNCTIONAL ASSESSMENT

Wetlands were classified using the USFWS wetland classification system (Cowardin et al., 1979). A wetland rating was completed for the on-site wetlands, using the 2014 Washington State Wetland Rating System for Western Washington (Ecology Rating System) (Hruby, 2014). Rating forms are included in **Appendix D**.

Wetland delineators visited each wetland and determined wetland classes and categories using field observations and resources utilized during the preliminary data review process. Ecology recognizes four categories of wetlands based on sensitivity to disturbance, rarity, the functions they provide, and difficulty to replace.

A qualitative functional assessment was also conducted for the wetland based on the Ecology Rating System (Hruby, 2014). Hydrologic, water quality, and habitat functions were evaluated based on the scoring criteria listed in **Table 1**.

Table 1: 2014 Wetland Functional Assessment Criteria

Wetland Functions	Criteria		
	Low Score	Moderate Score	High Score
Water Quality Functions	3-4	5-7	8-9
Hydrology Functions	3-4	5-7	8-9
Habitat Functions	3-4	5-7	8-9

3.0 PROJECT AREA SETTING

3.1 WATERSHED

The property is located in the Baker Creek watershed, at the upper end of the Squalicum Creek sub-watershed, a component of the Bellingham Bay watershed - within Water Resource Inventory Area (WRIA) 01.

The entire property is located on a hillslope that drains southward, west, and southeast-ward, generally into onsite wetlands, eventually draining offsite to the southeast and into Baker Creek. Baker Creek is located approximately 430 feet southeast of the southeast property corner, based on CityIQ measurements.

3.2 PROJECT VICINITY

The subject property is located in the northern portion of the City of Bellingham. This area of the city includes a mix of dense single-family development, undeveloped forest, industrial development, and low-density single-family development. Undeveloped forest is located north of the property. Low-density single-family development is located to the west. Industrial development is located to the east and south. Dense single-family developments are located to the southwest of the property.

3.3 REVIEW AREA

The review area includes the entire property which is predominantly a mixed coniferous-deciduous forest. Dominant forest canopy species include red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menziesii*), western red-cedar (*Thuja plicata*), and black cottonwood (*Populus balsamifera*). An historic logging road extends from the east-center property line to the north-center of the site. Old fill piles of concrete blocks and rubble material are located near the central portion of the property. Nine wetlands and one seasonally flowing stream were identified on the property. An artificial ditch is also located near the eastern portion of the property, which drains wetlands from the north side of the logging road into the seasonal stream. Site photographs are included in **Appendix B**.

4.0 RESULTS

4.1 PRELIMINARY RESEARCH

4.1.1 National Wetland Inventory

No wetlands or streams are mapped over the review area on the National Wetlands Inventory (NWI) mapper (USFWS, 2021).

4.1.2 Soils Survey Data

The western portion of the property is mapped with Whatcom silt loam, 8 to 15 percent slopes (soil unit 180). The center and southeast portion of the property is mapped with Whatcom silt loam, 3 to 8 percent slopes (soil unit 179). The east-central portion of the property is mapped with Whatcom silt loam, 0 to 3 percent slopes (soil unit 178). A small area near the northcentral portion of the property is mapped with Nati loam, 30 to 60 percent slopes (soil unit 110).

Nati loam is an ashy loam from the surface to 38 inches depth. This soil is well-drained with a water table at more than 80 inches depth. Nati loam is non-hydric. Whatcom silt loam is an ashy silt loam soil to 16 inches depth with loam from 16 to 60 inches depth. This soil is moderately well-drained with a water table between 18- and 36-inches depth. This soil is non-hydric (NRCS, 2021).

4.1.3 WDFW Priority Habitats and Species Data

The Washington State Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) Mapper identifies the entire township that includes the review area with big brown bat (*Eptesicus fuscus*). The northwestern portion of the property is listed as a biodiversity area, listed as "terrestrial habitat". The WDFW mapped polygon is described as steep, unbuildable forested area close to urban development with potentially important enclaves of wildlife habitat. Bald eagle nesting territories are located in this polygon, which extends offsite to the north (WDFW, 2021a).

4.1.4 City of Bellingham

The City of Bellingham CityIQ mapper identifies several wetlands over the review area based on a 2003 city wetland inventory (City of Bellingham, 2021).

The review area is also shown as a component of Forest Block 134, listed for protection, within the Final Bellingham Habitat Restoration Technical Assessment (City of Bellingham, 2015).

4.2 FIELD INVESTIGATION

4.2.1 Uplands

Upland areas over the review area are a mixed coniferous-deciduous forest that includes Douglas fir, big-leaf maple, western red-cedar, black cottonwood, western hemlock, red alder, snowberry (*Symphoricarpos albus*), Indian plum (*Oemleria cerasiformis*), oceanspray (*Holodiscus discolor*), salmonberry (*Rubus spectabilis*), vine maple (*Acer circinatum*), bleeding heart (*Dicentra formosa*), sword fern (*Polystichum munitum*), piggy-back plant (*Tolmiea menziesii*), low Oregon grape (*Mahonia nervosa*), and trailing blackberry (*Rubus ursinus*).

Upland soils generally consist of very dark brown (10YR 2/2), very dark grayish brown (10YR 3/2), or dark brown (10YR 3/3) loam. Upland soils are documented in data plots 2, 4, 6, 8, 12, 14, 15, and 17.

4.2.2 Onsite Wetland

Nine wetlands were identified in the review area: Wetlands A, B, C, D, E, F, G, I, and J. Wetlands A and C extend offsite. Onsite wetland boundaries were flagged by MES and surveyed by professional land surveyors. The wetlands are summarized below in Table 2. The wetlands are shown on the attached site map in **Appendix A**.

Table 2: Project Wetlands Summary

Wetland	Cowardin Classification	Ecology Category	HGM Class	Total Rating Score	Habitat Function Score (Points)	Wetland Size (Square Feet)	City of Bellingham Buffer Width (Feet)[1]
A	PFO/PEM	II	Depressional	20	Moderate (7)	>198,652[2]	150
B	PFO	III	Depressional	16	Moderate (6)	1,986	150
C	PFO/PEM	III	Depressional	18	Moderate (6)	>86,147[2]	150
D	PFO	III	Depressional	16	Moderate (6)	6,782	150
E	PFO	III	Depressional	16	Moderate (6)	6,623	150
F	PEM	III	Slope	17	Moderate (6)	4,065	150
G	PSS	IV	Slope	15	Moderate (6)	3,165	50
I	PSS	IV	Slope	14	Moderate (6)	1,840	50
J	PEM	IV	Slope	14	Moderate (6)	285	0[3]

[1]Assumes high intensity land use proposal – more than one unit per acre.
[2]Wetland extends offsite. This area includes onsite area only.
[3]Wetland J is exempt from buffer requirements.

Wetland A

Wetland A is a large, mosaic, Palustrine forested and emergent wetland in the southeast portion of the property. The wetland extends offsite to the east into a field, but MES flagged

only the onsite portion of the wetland. The onsite portion of Wetland A is 198,652 square feet in size. Wetland conditions are documented in data plots 1, 3, and 16.

Vegetation. Dominant plant species in Wetland A include red alder, black cottonwood, red-osier dogwood (*Cornus sericea*), salmonberry (*Rubus spectabilis*), Douglas spirea (*Spiraea douglasii*), black twinberry (*Lonicera involucrata*), creeping buttercup (*Ranunculus repens*), reed canarygrass (*Phalaris arundinacea*), lady fern (*Athyrium felix-femina*), and piggy-back plant (*Tolmiea menziesii*). The eastern portion of Wetland A (offsite) is predominantly reed canarygrass.

Hydrology. Wetland A is seasonally saturated and inundated. The wetland generally drains south and southeast via overland and shallow subsurface flow. A seasonally flowing stream flows east through the eastern portion of the wetland on the property and then offsite into a portion of the wetland dominated by reed canarygrass. The stream appeared to spread out and disperse through the grass area. Water from the wetland eventually flows into Baker Creek (based on lidar), located to the southeast.

Soils. Soils in Wetland A consist very dark grayish brown (10YR 3/2) loam from the surface to approximately 10 inches depth. Below 10 inches, soils consist of dark grayish brown (10YR 4/2) silt loam with redoximorphic concentrations. Soils in Wetland A meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. Per the City of Bellingham Municipal Code (BMC) 16.55, the wetland was rated using the 2014 Ecology rating system (Hruby, 2014). The wetland received a total score of 20 points with a habitat score of seven points (moderate). The wetland had no special characteristics and was rated as a Category II wetland using a functional score of 20. Under City of Bellingham Code this requires a 150-foot buffer for high intensity land use.

Wetland B

Wetland B is a small, Palustrine forested wetland, in the southern portion of the property, south of Wetland A. The wetland is 1,986 square feet in size. Wetland conditions are documented in DP-5 and adjacent upland conditions documented in DP-6.

Vegetation. Vegetation in the wetland includes red alder, black cottonwood, Douglas spirea, black twinberry, and dewey sedge (*Carex deweyana*).

Hydrology. Wetland B is seasonally saturated and seasonally ponded. The wetland has a seasonally flowing outlet to the northeast toward Wetland A.

Soils. Soils in the wetland consist of a very dark grayish brown (10YR 3/2) loam from the surface to 10 inches depth. Below 10 inches, soils consist of a dark grayish brown (10YR 4/2) silt loam with redoximorphic concentrations. Soils in Wetland B meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. The wetland was rated using the 2014 Ecology rating system (Hruby, 2014). The wetland received a total score of 16 points with a habitat score of six points (moderate). The wetland had no special characteristics and was rated as a Category III wetland using a functional score of 16. Under City of Bellingham Code this requires a 150-foot buffer for high intensity land use.

Wetland C

Wetland C is a mosaic, depressional, Palustrine emergent and forested wetland in the northeast portion of the review area, and extends offsite to the north and east. The onsite portion of Wetland C is 86,147 square feet in size. Wetland conditions are documented in DP-9 and adjacent upland conditions in DP-8.

Vegetation. Vegetation in the wetland includes black cottonwood, quaking aspen (*Populus balsamifera*), paper birch (*Betula papyifera*), red alder, black twinberry, Nootka rose (*Rosa nutkana*), Douglas spirea, and red-osier dogwood.

Hydrology. Wetland C is seasonally saturated and seasonally ponded. The wetland drains east via surface and subsurface flow. Several ditches appear to drain the offsite portion of the wetland eastward, based on aerial images and lidar.

Soils. Soils in the wetland consist of a black (10YR 2/1) silt loam from the surface to 11 inches depth. Below 11 inches, soils consist of very dark grayish brown (10YR 4/2) clay loam with redoximorphic concentrations. Soils in Wetland C meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. The wetland received a total score of 18 points with a habitat score of six points (moderate). The wetland had no special characteristics and was rated as a Category III wetland using a functional score of 18. Wetland C is required to have a 150-foot buffer for high intensity use.

Wetland D

Wetland D is a mosaic, depressional, Palustrine forested wetland in the northeast portion of the review area. The wetland is 6,782 square feet in size. Wetland conditions are documented in data plot 7 and adjacent upland conditions documented in DP-8.

Vegetation. Vegetation in the wetland includes black cottonwood, red alder, Douglas spirea, Pacific willow (*Salix lasiandra*), black twinberry, creeping buttercup, soft rush (*Juncus effusus*), piggy-back plant, Dewey sedge, and bentgrass (*Agrostis* spp.). Small patches of upland vegetation on hummocks includes big-leaf maple, Indian plum, snowberry, and Himalayan blackberry (*Rubus armeniacus*).

Hydrology. This wetland is seasonally saturated and seasonally ponded (between 25 and 50 percent of the wetland area). The wetland has a seasonal outlet to the southeast, toward Wetland E. The wetland receives hydrology from surface and shallow subsurface flow from the hillslope to the northwest and Wetland F.

Soils. Soils in Wetland D consist of a very dark brown (10YR 2/2) loam from the surface to 10 inches depth. Below 10 inches, soils are a dark grayish brown (10YR 4/2) silt loam with redoximorphic concentrations. Soils in Wetland D meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. This wetland received a total score of 16 points on the 2014 Ecology rating form with a habitat score of six points (moderate). The wetland had no special characteristics and was rated as a Category III wetland using a functional score of 16. Wetland D is required to have a 150-foot buffer for high intensity use.

Wetland E

Wetland E is a mosaic, depressional, Palustrine forested wetland located in the east-central portion of the property, downslope of Wetland D and C. The wetland is 6,612 square feet in size. Wetland conditions are documented in DP-10.

Vegetation. Vegetation in the wetland includes red alder, black cottonwood, Douglas spirea, black twinberry, creeping buttercup with snowberry on upland hummocks.

Hydrology. This wetland is seasonally saturated and seasonally ponded (approximately 25 to 50-percent ponded). The wetland receives hydrology from overland and shallow subsurface flow from areas upslope to the northwest and Wetland D. The wetland has a seasonally flowing outlet that connects to a ditch on the south side of an old logging road. The ditch flows south into Wetland A and the seasonal stream within Wetland A.

Soils. Soils in Wetland E consist of a very dark brown (7.5YR 2.5/2) loam from the surface to 11 inches depth. Below 11 inches, soils consist of a dark grayish brown (10YR 4/2) sandy loam with redoximorphic concentrations. Soils in Wetland E meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. Per BMC 16.55, the wetland was rated using the 2014 Ecology rating system (Hruby, 2014). The wetland received a total score of 16 points with a habitat score of six points (moderate). The wetland had no special characteristics and was rated as a Category III wetland using a functional score of 16. Wetland E is required to have a 150-foot buffer for high intensity use.

Wetland F

Wetland F is a Palustrine emergent, slope wetland (greater than five-percent slope). The wetland is 4,063 square feet in size. Wetland conditions are documented in data plot 11 and adjacent upland conditions in DP-12.

Vegetation. Vegetation in the wetland includes reed canarygrass.

Hydrology. This wetland is seasonally saturated. The wetland drains via subsurface flows to the southeast, toward Wetland D. The wetland receives surface and shallow subsurface flow from upslope areas to the northwest.

Soils. Soils in Wetland F consist of a very dark brown (10YR 2/2) loam from the surface to four inches depth. Below four inches, soils consist of dark grayish brown (10YR 4/2) clay loam with redoximorphic concentrations. Soils in Wetland F meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. Wetland F received a total score of 17 points with a habitat score of six points (moderate) on the 2014 Ecology rating form. The wetland had no special characteristics and was rated as a Category III wetland using a functional score of 17. Wetland F is required to have a 150-foot buffer for high intensity use.

Wetland G

Wetland G is a slope (greater than five-percent slope), Palustrine scrub-shrub wetland located in the central portion of the review area. The wetland is 3,165 square feet in size. Wetland conditions are documented in DP-13 and adjacent upland conditions in DP-14 and DP-15.

Vegetation. Dominant vegetation in the wetland includes salmonberry, lady fern, and stinging nettle.

Hydrology. This wetland is seasonally saturated. The wetland drains southeastward into Wetland A to the east. Wetland G receives shallow subsurface flow from the upland hillside to the northwest.

Soils. Soils in Wetland G consist of a very dark brown (10YR 2/2) loam from the surface to seven inches depth. Below seven inches, soils consist of dark grayish brown (10YR 4/2) silt loam with redoximorphic concentrations. Soils in Wetland G meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. The wetland received a total score of 15 points with a habitat score of six points (moderate). The wetland had no special characteristics and was rated as a Category IV wetland using a functional score of 15. Wetland G is required to have a 50-foot buffer for high intensity use.

Wetland I

Wetland I is a slope (greater than five-percent slope), Palustrine scrub-shrub wetland located near the center of the property, totaling 1,840 square feet in size. Wetland conditions are documented in data plot 18 while adjacent upland conditions are documented in DP-17.

Vegetation. Vegetation in the wetland includes salmonberry, lady fern, and common horsetail (*Equisetum arvense*).

Hydrology. This wetland is sloped and seasonally saturated. The wetland drains to the southeast, toward Wetland A. the wetland receives shallow surface hydrology from upslope areas to the northwest.

Soils. Soils in Wetland I consist of a very dark brown (10YR 2/2) loam from the surface to nine inches depth. Below nine inches, soils are dark grayish brown (10YR 4/2) silt loam with redoximorphic concentrations. Soils in Wetland I meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. The wetland received a total score of 14 points with a habitat score of six points (moderate). The wetland had no special characteristics and was rated as a Category IV wetland using a functional score of 14. Wetland I is required to have a 50-foot buffer for high intensity use.

Wetland J

Wetland J is a small, Palustrine emergent, slope (greater than five-percent slope) wetland located near the center of the property just north of Wetland I. The wetland is 285 square feet in size. Wetland conditions are documented in data plot 19.

Vegetation. Vegetation in the wetland includes reed canarygrass, lady fern, and common horsetail.

Hydrology. This wetland is a slope wetland with seasonal saturation. The wetland drains southeastward toward Wetland A. Wetland A receives shallow subsurface flow from the upslope hillside to the northwest.

Soils. Soils in Wetland J consist of a very dark grayish brown (10YR 3/2) loam from the surface to six inches depth. Below six inches, soils consist of a gray (5Y 5/1) gravelly sandy loam with redoximorphic concentrations. Soils in this wetland meet hydric soil indicator A11 – depleted below dark surface.

Wetland Rating. The wetland received a total score of 14 points with a habitat score of six points (moderate). The wetland had no special characteristics and was rated as a Category IV wetland using a functional score of 14.

Wetland J is exempt from City of Bellingham buffer requirements in the 2016 Critical Areas Ordinance (CAO) because it meets the following criteria: it is an isolated, Category IV wetland, less than 1,000 square feet in size; not associated with riparian areas or their buffers; does not contain habitat essential for local populations of priority species identified by WDFW or suitable breeding habitat; and is not part of a mosaic. Wetland J is considered "isolated" because it drains via overland and subsurface flows to upland forest and does not have a direct surface water connection to other wetlands or waterways.

4.2.3 Fish and Wildlife Habitat Conservation Areas

Stream

A seasonally flowing, non-fish stream is located within the eastern end of Wetland A. The onsite portion of the stream is two to four feet wide with silty substrate and partially vegetated with reed canarygrass. The stream continues to flow south for a short distance in the offsite portion of wetland before water disperses into the wetland and loses a defined channel. Water then drains southeastward through the wetland and may be intercepted by a ditch draining southward on the adjacent property (based on lidar and City GIS topography). This drainage appears to cross the Ross Street right-of-way and drain southward in a ravine toward Baker Creek. As the mapped stream segment within Wetland A does not have an apparent channelized connection to downstream waters, it is designated as a non-fish stream.

Additionally, MES identified a ditch on the east side of the property, draining runoff from the onsite old logging road and Wetlands D and E southward into Wetland A. The ditch eventually drains into the onsite stream. This ditch is artificial, linear, with distinct steep side slopes and constructed within upland area. As such, this is not a regulated feature in the City of Bellingham Code.

Pileated Woodpecker

Priority habitats and areas associated with state priority species are considered habitat conservation areas under BMC 16.55.470(A)(1)(c). Pileated woodpecker (*Dryocopus pileatus*) is a candidate species in Washington. Additionally, pileated woodpecker breeding areas are

listed as a priority habitat. The breeding areas include areas necessary to support reproduction and the rearing of young: including breeding sites and adjacent foraging habitat.

This species is a year-round resident in western Washington inhabiting forested areas that may include: mature, old-growth forests, and second-growth forests with large snags and fallen trees (Lewis and Azerrad, 2004). Large snags and large decaying live trees are necessary for nesting and roosting. Forests less than 40 years old may be utilized as foraging habitat.

The review area contains a mixed deciduous and coniferous forest. Numerous snags and decaying live trees were observed onsite and extending onto adjacent properties to the north, providing potential foraging habitat for pileated woodpecker.

Priority Snags and Logs

Priority snags and logs are considered a habitat conservation area under BMC 16.55.470(A)(1)(c) as they are a state priority habitat. To qualify as a priority feature, snags must be more than 20 inches diameter at breast height (DBH) and 6.5 feet in height. Priority logs must be more than 12 inches in diameter at the greatest width and more than 20 feet long. Several priority snags and logs were observed on the property.

Mature Forest

Mature forest is considered a habitat conservation area under BMC 16.55.470(A)(1)(c) as it is a state priority habitat. WDFW defines a mature forest as one that has a stand more than 7.5 acres in size with the average tree size exceeding 21 inches diameter at breast height (DBH) (WDFW, 2008). Several large trees were observed onsite, particularly in the northwest portion of the property, however the density trees with a DBH greater than 21 inches did not appear to meet the WDFW definition based on visual observations. A detailed tree size and density analysis was not completed.

Bats

Priority habitats and areas associated with state priority species are considered habitat conservation areas under BMC 16.55.470(A)(1)(c), including big brown bat. Big brown bat mapped within the township that includes the subject property (WDFW, 2021b). WDFW has a *Living with Wildlife: Bats* informational flyer and additional information on bats available at: https://wdfw.wa.gov/living/bats.html.

Bat roosting may occur onsite, although MES did not directly observe any bats or roosting.

Biodiversity Areas

The northwestern portion of the property is listed as a biodiversity area, listed as “terrestrial habitat”. The WDFW mapped polygon is described as a steep, unbuildable forested area close to urban development with potentially important enclaves of wildlife habitat. Bald eagle nesting territories are located in this polygon, which extends offsite to the north. The northwest quarter of the property does include steep slopes, in the north-central portion of the site, just west of Wetland F. This steeply sloped area in the north-central portion of the property is not

proposed for development. The area to the west of the steeper slopes, in the northwest corner of the property, contains a more gradual slope that slopes downward to the south.

4.2.4 Wildlife

Wildlife that may utilize the habitat on this property, coniferous/deciduous forest and forested wetlands. Common terrestrial species that could occur onsite include black-tailed deer (*Odocoileus hemionus columbianus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), eastern cottontail (*Sylvilagus floridanus*), Douglas squirrel (*Tamiasciurus douglasii*), deer mouse (*Peromyscus maniculatus*) and opossum (*Didelphis marupialis*). Additionally, common songbirds, owls and falcons may utilize the property for nesting and foraging.

Wetlands A and C are mosaic wetlands with some areas of seasonal ponding. These areas may provide breeding habitat for amphibians, such as Pacific treefrog (*Hyla regilla*). During the site visit MES observed a rough-skinned newt (*Taricha granulosa*) in Wetland A.

4.2.5 Off-site (Adjacent) Critical Areas

Off-site areas were viewed as feasible given site conditions at the time of the site visit. Other information was used where applicable including aerial photography, lidar, and CityIQ mapping to assess off-site conditions. Conditions were viewed or estimated to a distance of roughly 100 feet from the property boundaries.

Off-site Areas- West

The area west of the review area is steeply sloped down to the west. Two single-family houses are located to the west with large areas of forested vegetation similar to onsite upland vegetation. MES did not observe any obvious wetland hydrology indicators offsite to the west. A wetland delineation by Northwest Ecological Services, LLC (NES) in 2014 indicates a wetland offsite to the west. Based on measurements in CityIQ, the wetland is more than 200 feet from the western property boundary. The offsite wetland was determined to be a Category III wetland with a 100-foot buffer in 2014, which would not extend onto the review area (NES, 2014).

Off-site Areas- East

Areas offsite to the east include hayfield and a dirt/wood material stockpile areas. Wetland C extends offsite to the east an unknown distance. Wetland A also extends offsite to the east. With the exception of Baker Creek, no wetlands or streams are mapped offsite on CityIQ.

Off-site Areas- South

Wetland A extends offsite to the south an unknown distance. A separate wetland is mapped on CityIQ approximately 370 feet south of the southern property boundary from a wetland delineation in 2000. The wetland is shown with a 50-foot buffer (City of Bellingham, 2021).

Off-site Areas- North

The properties to the north consist of steep forest. The property north of the northwest portion of the review area is owned by the City of Bellingham. No wetlands are mapped offsite to the north. MES did not observe any obvious wetland hydrology indicators offsite to the north.

4.3 WETLAND FUNCTIONAL ASSESSMENT

Wetland functional value was assessed for utilizing the Ecology Wetland Rating Form for Western Washington (Hruby, 2014). This rating method evaluates wetlands based on three categories of function, which include water quality, hydrologic function, and habitat value.

Table 3: Wetland Functional Value Summary[1]

Wetland	Water Quality Function	Hydrologic Function	Habitat Function
A	Moderate (7)	Moderate (6)	Moderate (7)
B	Moderate (6)	Low (4)	Moderate (6)
C	Moderate (6)	Moderate (6)	Moderate (6)
D	Moderate (6)	Low (4)	Moderate (6)
E	Moderate (6)	Low (4)	Moderate (6)
F	Moderate (6)	Moderate (5)	Moderate (6)
G	Moderate (5)	Low (4)	Moderate (6)
I	Moderate (5)	Low (3)	Moderate (6)
J	Moderate (5)	Low (3)	Moderate (6)

[1]Functional scores included in parentheses.

4.3.1 Water Quality Function

Water quality function is assessed by characterizing the amount and type of vegetation present within a wetland. Plants enhance sedimentation by acting like a filter causing sediment particles to drop to the wetland surface. Other variables include the average slope within slope wetlands, outlet type, and amount of seasonal ponding within depressional wetlands. The potential for the landscape to support water quality functions is also assessed, including potential pollutant sources from stormwater septic systems or other sources. Additionally, water quality value to society is assessed based on the wetland's proximity to polluted waterbodies, with the assumption that wetlands can improve water quality before reaching downstream waterways.

All of the wetlands on the review area provide moderate water quality functions. These wetlands are either slope or depressional wetlands. The depressional wetlands (A, B, C, D, and E) have seasonally flowing outlets with persistent vegetation and areas of seasonal ponding, increasing their potential to capture pollutants and improve water quality. With the exception of Wetlands A and C, the onsite wetlands lack the opportunity to provide water quality functions as they do not receive stormwater discharge or runoff from other pollutant sources. Water quality functions provided by the all wetlands are important due to their location in an impaired basin – Baker Creek is listed more than one mile downstream for high bacteria and low dissolved oxygen.

The slope wetlands (F, G, I, and J) are on slopes greater than five-percent, which reduces their potential to capture pollutants in runoff. Wetlands G, I, and J have less than 90-percent dense, rigid vegetation, which also reduces their potential to capture pollutants in runoff.

4.3.2 Hydrologic Function

Wetlands have the ability to reduce flooding and stream erosion in downstream areas. This is accomplished through the entrainment, storage, and slow release of water, which acts to moderate flood pulses following storm events. Characteristics of this function include the vegetation characteristics (reduction of water velocity in slope wetlands), outlet type, and depth of storage for depressional wetlands. Hydrologic function is also influenced by the landscape and input of potential stormwater discharges and excess runoff from urban and developed areas. The hydrologic function of a wetland is also assessed in relation to its value to society. Wetlands that are located upstream of flood zones may help reducing flooding and protect down-gradient resources (human or natural).

Wetlands A and C

Wetlands A and C provide moderate hydrologic function. These wetlands are depressional with seasonally flowing outlets and limited seasonal flood storage potential. The wetlands' storage in relation to their contributing basin is high. Wetlands A and C also receive stormwater inputs from the storage yard to the east.

Wetland F

Wetland F provides moderate hydrologic function. The wetland is located on a slope, but has dense, rigid vegetation (reed canarygrass) which slows runoff. The wetland has little potential to provide hydrologic functions as it is surrounded by undisturbed upland forest.

Wetlands B, D, and E

Wetlands B, D, and E provide low hydrologic functions. These wetlands are depressional with seasonally flowing outlets with moderately-sized contributing basins. The wetlands lack the opportunity to provide hydrologic functions because they are surrounded by undeveloped forest.

Wetlands G, I, and J

Wetlands G, I, and J provide low hydrologic functions. These are slope wetlands with less than 90-percent dense, rigid vegetation and no potential to support hydrologic functions due to their location in an undeveloped forest, with no hydrologic contributions from developed areas.

4.3.3 Habitat Function

Wetlands can provide habitat value to a variety of wildlife species by providing a variety of habitat types, water regimes, habitat features (such as snags and downed logs), and number of plant species. Additionally, the wetland's opportunity to provide habitat is important, as characterized by buffer condition, corridors and connections, position in the landscape, and proximity to priority habitats and undisturbed habitat.

All of the reviewed wetlands provide moderate habitat functions. The wetlands have one or two vegetation classes, one or two hydroperiods, little to no habitat interspersion, and habitat features such as snags/logs. The wetlands are located within proximity to accessible habitat that includes undisturbed forest and low-moderate intensity land uses (such as fields and low-density residential development). The habitat onsite is rated as valuable to society as the wetlands are located within 100 meters of one or more priority habitats, such as riparian habitat, instream habitat, biodiversity areas, and priority snags/logs.

5.0 REGULATORY REQUIREMENTS

The wetlands identified on the property are subject to federal regulations under the Clean Water Act (CWA) Sections 404 and 401, as well as state regulations under the Growth Management Act administered by the City of Bellingham under the Critical Areas Chapter (BMC 16.55).

5.1 CWA SECTION 404- US ARMY CORPS OF ENGINEERS

Pursuant to Section 404 of the CWA, the Corps regulates the discharge of dredged and/or fill material into waters of the United States, including wetlands. Any impacts to onsite wetlands would require a Nationwide Permit (for up to 0.5 acre of wetland fill) or an Individual Permit (for greater than 0.5 acre of wetland fill).

5.2 CWA SECTION 401- DEPARTMENT OF ECOLOGY

Ecology is the state agency responsible for administering the CWA Section 401 Water Quality Certification program. Impacts to wetlands may require approval or a waiver from the Department of Ecology.

5.3 CRITICAL AREAS ORDINANCE- CITY OF BELLINGHAM

The City of Bellingham regulates critical areas, including wetlands and their associated buffers, and fish and wildlife habitat conservation areas under Title 16, Chapter 55 of the Bellingham Municipal Code. Impacts to wetlands and buffers require a Critical Areas Permit and compensatory mitigation. Buffer widths are determined based on the proposed land use intensity, wetland category, and habitat score. Wetland buffers for wetlands within the review area and adjacent are listed in **Table 2** above, based on a proposed high-intensity land use.

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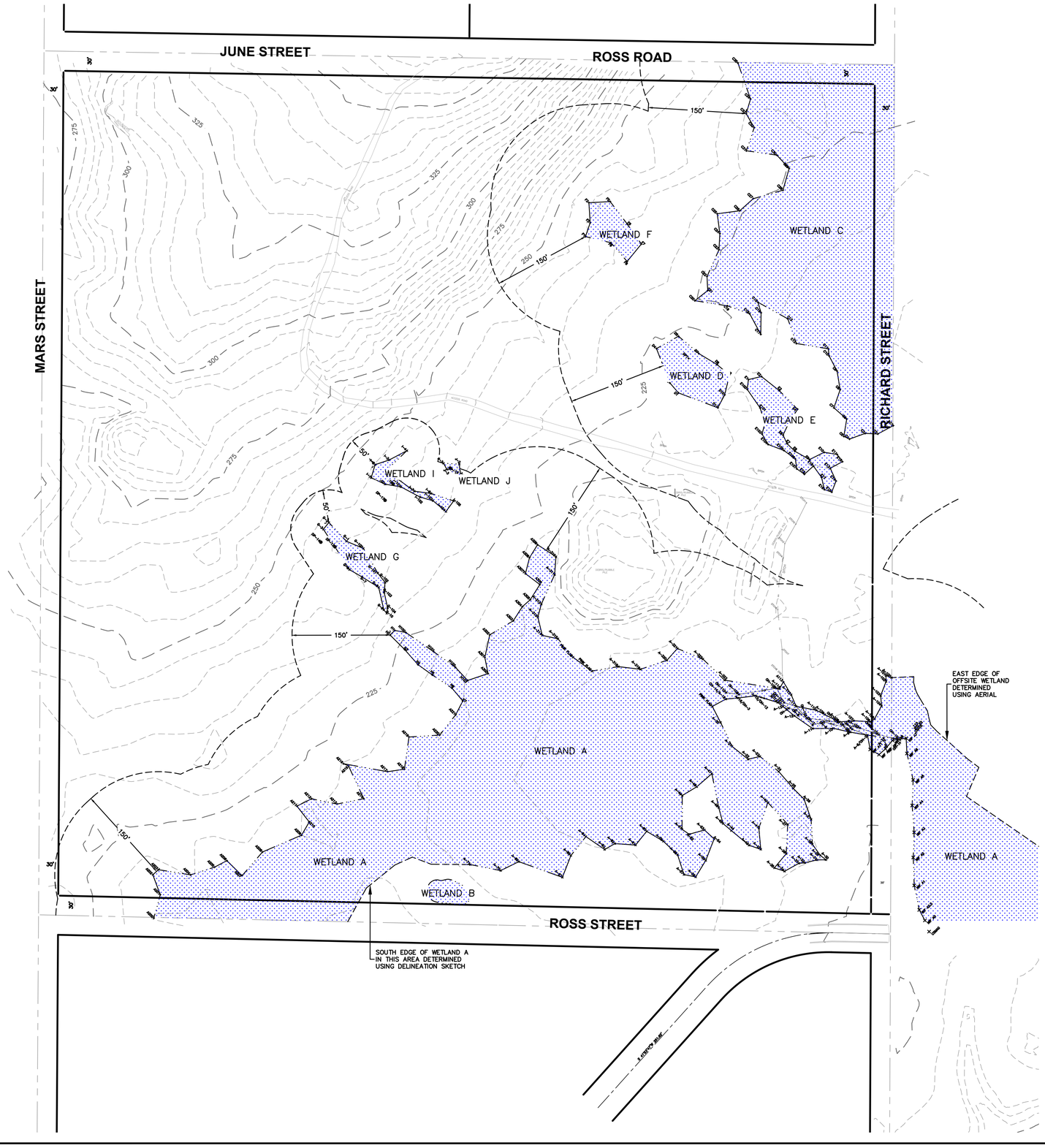
APPENDICES

Appendix A

Existing Conditions Map



N
W E
S

0 40 80 160
1 inch = 80 ft.

WETLAND LEGEND

EXISTING WETLAND

DITCH

STREAM

220 West Champion Street, Suite 200 t. 360.650.1408
Bellingham, WA 98225 f. 360.650.1401
FREELAND & ASSOCIATES

REV:	DATE:	DESCRIPTION:	BY:

CLIENT:
QUEEN MOUNTAIN HOMES LLC
4638 CELIA WAY UNIT 202
BELLINGHAM WA, 98226

CALL BEFORE YOU DIG
FOR BURIED UTILITY LOCATIONS
1-800-424-5555

PROJECT LOCATION:
QUEEN MOUNTAIN PLAT
4175 IRONGATE ROAD
BELLINGHAM, WA 98226

DRAWING #: 18271SP14.DWG
DRAWN BY: NSP
DESIGNED BY: NSP
CHECKED BY: HAF

SHEET CONTENTS:
EXISTING WETLANDS

JOB #: 18271
DATE: 2-11-2021
SCALE: HORIZ: 1"=80' VERT: 1"=80'
SHEET: W1

Appendix B

Site Photographs

Site Photographs

Photo 1. Segment of stream within Wetland A (3/1/19).

Photo 2. Wetland A near the eastern property boundary (4/23/19).

Photo 3. Northwest portion of Wetland A (5/7/19).

Photo 4. Offsite portion of Wetland A, facing east from the eastern property boundary (4/23/19).

Photo 5. Wetland B (4/23/19).

Photo 6. Wetland C (5/1/19).

Photo 7. Wetland D (5/1/19).

Photo 8. Wetland E (5/1/19).

Photo 9. Wetland F (5/1/19).

Photo 10. Wetland G (5/7/19).

Photo 11. Wetland I (5/7/19).

Photo 12. Wetland J (5/7/19).

Photo 13. Fill piles north of Wetland A (5/7/19).

Photo 14. Upland forest in the northwest portion of the property (5/1/19).

Revised Mitigation Plan
Wetlands and Habitat Conservation Areas
Queen Mountain Plat

Bellingham, Washington

for
Singh Enterprises, LLC

February 24, 2023

Project Number 190012

MILLER
ENVIRONMENTAL
SERVICES, LLC

REVISED MITIGATION PLAN
WETLANDS AND HABITAT CONSERVATION AREAS
QUEEN MOUNTAIN PLAT

Bellingham, Washington

February 24, 2023

Prepared for:

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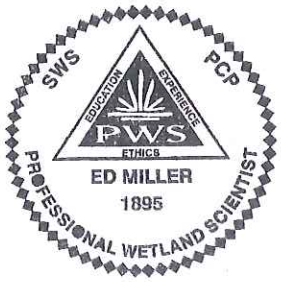

Author Qualifications

This report was prepared by Ed Miller.

Ed Miller is a senior biologist and owner of Miller Environmental Services, LLC, who specializes in wetlands, wildlife, and habitat assessment. He is a Society of Wetland Scientists certified Professional Wetland Scientist (PWS), #1895. Mr. Miller has obtained a Bachelor of Science in Terrestrial Ecology from Western Washington University in 1993 and a Masters of Environmental Science and Management with a focus on Watershed Management at the University of California at Santa Barbara in 2000. His 17 years of experience includes preparing wetland delineations and reports, wetland functional assessments, stream and shoreline ordinary high water mark determinations, habitat conservation area reports, mitigation design, mitigation monitoring and floodplain habitat assessments for FEMA Endangered Species Act compliance. Mr. Miller has completed project permitting and compliance for agencies including U.S. Army Corps of Engineers (Corps), U.S. Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW), Washington Department of Ecology (Ecology).

Disclaimer

This report, wetland and/or stream delineation, and/or marine ordinary high watermark determination, is based on protocols that are described and defined in manuals and publications utilized by Federal, State, and Local agencies. The wetland delineation methodology used is consistent with the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997), the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps, 2010), and subsequent Corps guidance. Ordinary high water mark determinations were performed based on Department of Ecology guidelines from *Determining the Ordinary High water Mark for Shoreline Management Act Compliance in Washington State* (Ecology, 2016). This report is based on requirements from the local jurisdiction and any associated policies or code interpretations that have been approved and made available to the public at the time of this report. Completed work is based on conditions at the time of the site visit. No guarantees are given that a delineation determination or assessment will concur exactly with those performed by regulatory agencies or by other qualified professionals.

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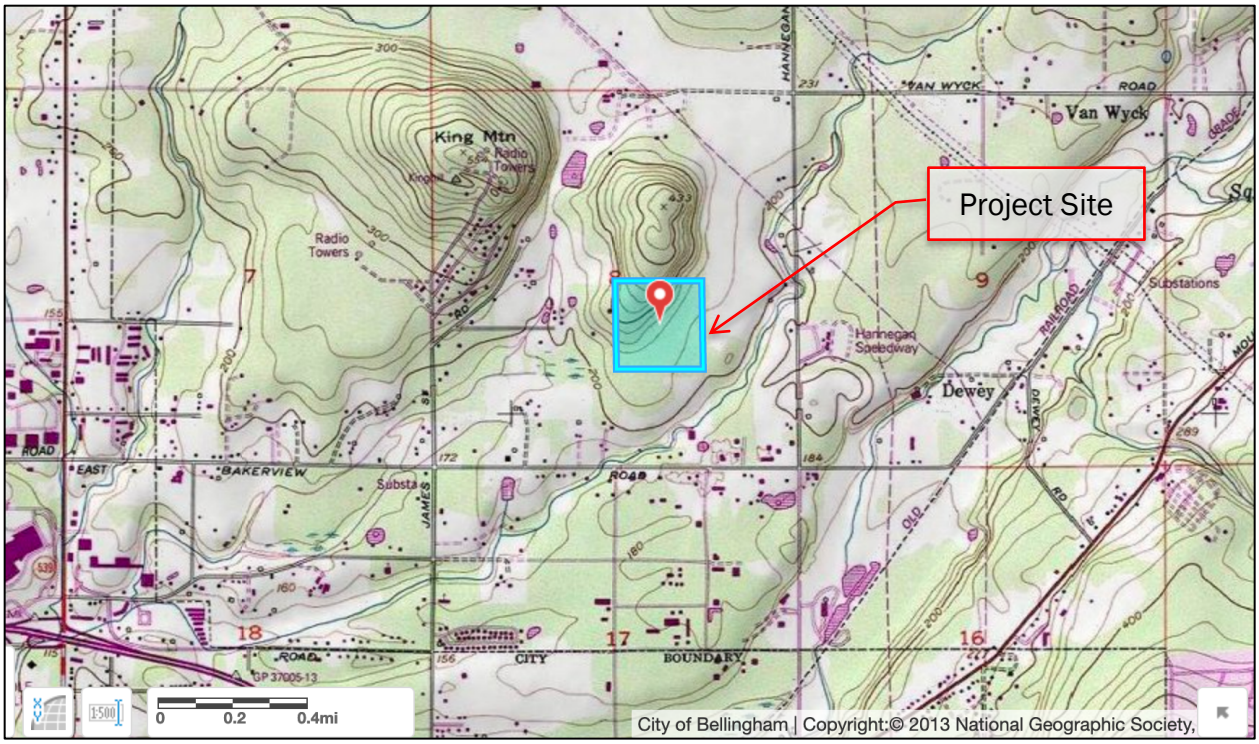
1.0 INTRODUCTION

At the request of the applicant, Singh Enterprises, LLC, Miller Environmental Services, LLC (MES) completed this mitigation for the Queen Mountain Plat Project (parcel # 380308-449210) located at the north end of Iron Gate Road in Bellingham, Washington; Section 8, Township 38 N, Range 3 E, W.M. The project location is shown below on **Figure 1**. A map of the property and critical areas is included as **Appendix A**.

Figure 1: Vicinity Map



1.1 PURPOSE

This Mitigation Plan was prepared as required by the City of Bellingham Critical Areas Ordinance (CAO). This report includes mitigation for proposed wetland and buffer fill as shown on the site maps in **Appendix A**. A wetland delineation was previously conducted and documented by MES and is documented in the *Critical Areas Report: Wetlands & Habitat Conservation Areas for Queen Mountain Plat*, (MES, January 29, 2021).

2.0 METHODS

2.1 FIELD INVESTIGATION

A site investigation of the review area was conducted for the wetland delineation on April 23, March 1, May 1 and May 7, 2019 to document existing conditions. This included a wetland delineation, an assessment of onsite habitat, and documentation of potential mitigation opportunities. Wetland boundaries and data plot locations were flagged and surveyed by professional land surveyors. Details of the wetland delineation are within a separate

document: Critical Areas Report: Wetlands & habitat Conservation Areas for Queen Mountain Plat (MES, Jan. 29, 2021).

Site photographs taken during the site visit are included within **Appendix B**.

3.0 PROJECT AREA SETTING

3.1 PROJECT VICINITY

The subject property is located in the northern portion of the City of Bellingham. This area of the city includes a mix of dense single-family development, undeveloped forest, industrial development, and low-density single-family development. Undeveloped forest is located north of the property. Low-density single-family development is located to the west. Industrial development is located to the east and south. Dense single-family developments are located to the southwest of the property.

3.2 PROJECT SITE

The review area includes the entire property which is predominantly a mixed coniferous-deciduous forest. Dominant forest canopy species include red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menziesii*), western red-cedar (*Thuja plicata*), and black cottonwood (*Populus balsamifera*). An historic logging road extends from the east-center property line to the north-center of the site. Old fill piles of concrete blocks and rubble material are located near the central portion of the property. Nine wetlands and one seasonally flowing stream were identified on the property. An artificial ditch is also located near the eastern portion of the property, which drains wetlands from the north side of the logging road into the seasonal stream. Site photographs are included in **Appendix B**.

4.0 RESULTS

4.1 FIELD INVESTIGATION

Nine wetlands were identified in the review area: Wetlands A, B, C, D, E, F, G, I, and J. Wetlands A and C extend offsite. Onsite wetland boundaries were flagged by MES and surveyed by professional land surveyors. The wetlands are summarized below in **Table 1**. The wetlands are shown on the attached site map in **Appendix A**. Additional updated material regarding Wetland A and wildlife habitat areas is provided below.

Table 1: Project Wetlands Summary

Wetland	Cowardin Classification	Ecology Category	HGM Class	Total Rating Score	Habitat Function Score (Points)	Wetland Size (Square Feet)	City of Bellingham Buffer Width (Feet)[1]
A	PFO/PEM	II	Depressional	20	Moderate (7)	>198,652[2]	150
B	PFO	III	Depressional	16	Moderate (6)	1,986	150
C	PFO/PEM	III	Depressional	18	Moderate (6)	>86,147[2]	150
D	PFO	III	Depressional	16	Moderate (6)	6,782	150
E	PFO	III	Depressional	16	Moderate (6)	6,623	150
F	PEM	III	Slope	17	Moderate (6)	4,065	150
G	PSS	IV	Slope	15	Moderate (6)	3,165	50
I	PSS	IV	Slope	14	Moderate (6)	1,840	50
J	PEM	IV	Slope	14	Moderate (6)	285	0[3]

[1]Assumes high intensity land use proposal – more than one unit per acre.
[2]Wetland extends offsite. This area includes onsite area only.
[3]Wetland J is exempt from buffer requirements.

Wetland A Additional Detail. As described in the previously submitted Critical Areas Report (MES, Jan. 29, 2021) Wetland A is a mosaic wetland. This means, the wetland consists of wetland and upland areas intermixed together but considered as one wetland unit. Ecology guidance states that a mixture of uplands and wetlands are considered a mosaic if: each patch of wetland is less than 1 acre, each patch is less than 100 feet away from the nearest wetland, the total area of wetland within the unit is greater than 50 percent, and there are at least three patches of wetland that meet the size and distance thresholds. Wetland A meets all of these criterial – and as such is considered a mosaic wetland. Given the large size of the wetland, over a variable landscape, estimating the exact area of upland within it is difficult. However, based on multiple site visits a range of the amount of upland within Wetland A is estimated at 20 to 40 Percent. The Wetland A rating form is attached in **Appendix C**.

City of Bellingham Wildlife Habitat Areas. The City of Bellingham released a study in the later part of 2021, after the completed prior Critical Areas Report, consisting of a city-wide wildlife corridor analysis (Diamondhead Consulting, 2021). This study identified and modeled three focal species to determine important habitat patches and wildlife corridors within the City of Bellingham. The forest patch comprising the Queen Mountain project site is designated as an important wildlife habitat area. This habitat patch extends southward to Irongate Road and westward offsite – extending west within two forest areas on either side of Montgomery Road. A residence is located within the northern lobe offsite. An important wildlife corridor is shown extending westward from the southwestern lobe of the wildlife habitat patch (located offsite). This corridor extends westward through an open grass area, a patch of forest, residential yards and across James Street, where it connects with another wildlife habitat patch on the west side of James Street. Additionally, an important wildlife corridor is shown to the southeast of the patch, associated with the Baker Creek riparian corridor. This corridor is separated from the habitat patch associated with Queen Mountain by the existing Irongate Road, mowed field and commercial use of the property to the east.

This information does not affect the Wetland A habitat rating. Biodiversity areas and corridors is checked on question H3.1 and the wetland already has the maximum number of points for H3.0.

City of Bellingham Urban Forest. The existing subject property is 36.22 acres in size, with a majority of it containing forest habitat – 33 acres. Approximately 3 acres of the property includes the existing road and gravel/rubble areas. The forest is a mixture of deciduous forest, within wetland areas, and coniferous forest within remaining areas of the property.

5.0 REGULATORY REQUIREMENTS

The wetlands identified on the property are subject to federal regulations under the Clean Water Act (CWA) Section 404, as well as state regulations under the Growth Management Act administered by the City of Bellingham under the CAO.

5.1 CWA SECTION 404- ARMY CORPS OF ENGINEERS

Pursuant to Section 404 of the CWA, the Corps regulates the discharge of dredged and/or fill material into waters of the United States, including wetlands. Any impacts to onsite wetlands would require a Nationwide Permit (for up to 0.5 acre of wetland fill) or an Individual Permit (for greater than 0.5 acre of wetland fill). A Nationwide Permit will be required for this project.

5.2 CWA SECTION 401- DEPARTMENT OF ECOLOGY

The Department of Ecology is the state agency responsible for administering the CWA Section 401 Water Quality Certification program. Wetland impacts requiring a Corps permit under Section 404 of the CWA are also subject to the provisions of Section 401. Corps regulations require that a 401 Certification or waiver thereof be issued by the responsible state agency before the 404 permit becomes valid.

5.3 CRITICAL AREAS ORDINANCE- CITY OF BELLINGHAM

The City of Bellingham regulates critical areas, including wetlands and their associated buffers, and fish and wildlife habitat conservation areas under Title 16, Chapter 55 of the Bellingham Municipal Code. Impacts to wetlands and buffers require a Critical Area Permit and compensatory mitigation. Buffer widths are determined based on the proposed land use intensity, wetland category, and habitat score. Wetland buffers for wetlands within the review area and adjacent are listed in **Table 1** above, based on a proposed high-intensity land use.

Per City of Bellingham Code (16.55.340.C.2) buffers may be reduced with the following conditions:

a. The buffer of a Category I wetland shall not be reduced;

b. The buffer reduction shall not adversely affect the functions and values of the adjacent wetlands;

c. The buffer of a Category II or III wetland shall not be reduced to less than 75 percent of the required buffer or 50 feet, whichever is greater;

d. The buffer of a Category IV wetland shall not be reduced to less than 50 percent of the required buffer, or 25 feet, whichever is greater, provided the buffer reduction does not result in reducing the functions and values of the wetland; and

e. The applicant implements all reasonable measures to reduce the adverse effects of adjacent land uses and ensure no new loss of buffer functions and values. The specific measures that shall be implemented include, but are not limited to, the following:

    i. Direct lights away from the wetland and buffer;

    ii. Locate facilities that generate substantial noise (such as some manufacturing, industrial and recreational facilities) away from the wetland and buffer;

    iii. Implement integrated pest management programs;

    iv. Infiltrate or treat, detain and disperse runoff into buffer;

    v. Construct a wildlife permeable fence around buffer and post signs at the outer edge of the critical area or buffer to clearly indicate the location of the critical area according to the direction of the City;

    vi. Plant buffer with "impenetrable" native vegetation appropriate for the location;

    vii. Use low impact development techniques to the greatest extent possible;

    viii. Establish and record a permanent conservation easement to protect the wetland and the associated buffer and restrict the use of pesticides and herbicides in the easement.

In addition to the required buffers, a 15-foot building setback from the edge of buffers is also required under BMC 16.55.340(G) for around above ground structures, paving, and other hard surfaces – unless the director determines a shorter distance is appropriate. This setback is to avoid conflicts with tree branches and/or critical root zones of trees that are in the buffer or will be planted in the buffer.

6.0 PROJECT DESCRIPTION AND IMPACT ASSESSMENT

The proposed project has gone through numerous design iterations, to reduce impacts to onsite wetlands and habitat conservation areas. The proposed project size has been reduced and the access road rerouted to reduce impacts. More of the proposed density is planned to be townhomes, a higher density, smaller footprint residence.

The current proposed project includes a single-family and townhome residential development, the construction of a site access road from the easterly end of Ross Street at the southeast corner of the property, grading of interior lots and roads, utilities installation and stormwater

collection and treatment infrastructure. A stormwater pond is proposed for the eastern side of the project site, adjacent to the south side of the site access road.

Given the location of large wetlands across the eastern side of the property, the project cannot avoid direct and indirect wetland impacts to provide access and construct a residential project.

Site plans showing the existing conditions, proposed project and impacts and mitigation are in **Appendix A.**

6.1 WETLAND IMPACTS

Direct Impacts

The construction of the proposed residential development will result in the direct fill of a small portion of Wetland A totaling 1,102 square feet. This impact will occur with the construction of a box culvert, under the site access road, where it crosses a narrow portion of Wetland A and a stream. The actual impact will be by shading of vegetation. Additionally, a small amount of direct impact to Wetland E, 62 square feet in size, will occur with construction of the site access road. All other direct wetland impacts are avoided. Previous project iterations included more direct impacts to Wetland A, Wetland G, I and J. The project footprint was altered to eliminate these direct impacts.

Functions lost with this proposed direct fill include a small amount of water quality and hydrologic function – as the area proposed for fill is a sloped linear wetland adjacent to a small non-fish stream. This area does not entrain large amounts of water and is generally seasonally saturated. Habitat function will also be lost with the proposed fill, the area generally contains shrub and herbaceous vegetation.

Though the area is tabulated as direct impact, the portion of filled wetland will be located under a large box culvert and will still provide a connection between the two portions of Wetland A. The area under the box culvert will allow wildlife to pass under the roadway.

Indirect Impacts

Portions of the proposed project, the site access road and stormwater pond, are located adjacent to wetlands such that indirect wetland impacts may occur. These impacts cannot be avoided as access to the site must occur from the southeast corner. Indirect wetland impacts total 49,775 square feet. These are outlined below in **Table 2.** As the Wetland A and B buffers adjacent to the proposed access road are proposed for buffer reduction (see **Section 6.2** below) from 150 feet to 112.5 feet, indirect impacts from the site access road were calculated to a distance of 112.5 feet. Indirect impacts will affect Wetlands D and E in their entirety and a small portion of Wetland I.

Wetland functions that will be lost are primarily habitat functions – with the loss of a portion of buffer. The area of buffer lost is primarily forest habitat, impacted with the construction of the site access road. Portions of the Wetland A buffer extend over the rubble fill pile area.

However, no wetland habitat function (indirect impact) will be lost with removal of the rubble pile and construction of a large portion of the stormwater pond.

A majority of the proposed stormwater pond will be constructed over a disturbed area that contains gravel, invasive species and a large rubble pile (with no vegetation). As the approximate existing functional buffer is approximately 50 feet on the northeast side of Wetland A (where the south end of the stormwater pond is proposed), indirect impacts were calculated to 50 feet.

This was based on Ecology guidance (Ecology, 2021) which states that the recommended buffer width provides a starting point for determining the extent of indirect impacts. The agencies will also consider the condition of existing buffers (e.g., presence, width, type of vegetation, and slope) when determining the extent of indirect impacts and the required compensation ratio. The area of buffer northeast of Wetland A, proposed for stormwater pond, consists of rock/rubble pile and gravel with invasive vegetation, where any is present. Additionally, a stormwater pond is a lower level of long term impact. The area of the pond will not have people or cars, and in fact will provide screening between the wetland and the site access road. Stormwater ponds also provide some habitat value to bird species and amphibians. The proposed pond will provide a higher level of habitat value than the gravel and rubble pile currently at this location.

The location of proposed impacts and mitigation are shown on the maps in **Appendix A.**

Table 2: Proposed Critical Areas Impacts and Mitigation

Type of Impact	Impact Area (square feet)	Mitigation Type
Wetland Impacts		
Wetland A Direct Fill[1]	1,040	Wetland creation
Wetland A Indirect Fill	31,905	Wetland creation and preservation
Wetland C Indirect Fill	3,697	Wetland creation and preservation
Wetland D Indirect Fill	6,782	Wetland creation and preservation
Wetland E Direct Fill	62	Wetland creation
Wetland E Indirect Fill	6561	Wetland creation and preservation
Wetland G Indirect Fill	196	Wetland creation and preservation
Wetland I Indirect Fill	634	Wetland creation and preservation
Total:	***Direct Wetland Fill = 1,102 square feet (0.025 acre)*** ***Indirect Wetland Fill = 49,775 square feet (1.14 acre)***	

[1] Impacts to the onsite stream are included within Wetland A direct impacts

Mitigation for direct and indirect wetland impacts is proposed in the form of wetland creation and wetland preservation and is described in more detail in **Section 8.0**. The proposed mitigation, wetland creation and preservation, is allowed per BMC 16.55.350.B.4 – where wetland preservation in combination with other forms of mitigation is allowed.

Temporary Impacts

Temporary impacts, 7,555 square feet in size, may occur to the Wetland A buffer along the edges of the proposed access road corridor and at the southwest corner of the stormwater pond. This may include some vegetation removal and grading. Once construction is complete, these areas will be restored with the installation of mulch and native plants.

Cumulative Impacts

The proposed project site is within the Baker Creek basin, tributary to the Squalicum Creek basin. The upper portion of this basin extends to the northeast outside of the City limits while the lower portion of the basin is within heavily developed areas of the City of Bellingham. The portion of the basins in Whatcom County are zoned for a lower level of development than the City, and contain large areas of undeveloped forest, hayfields and low density residential development.

Cumulative impacts to remaining onsite wetlands are not anticipated, as most of the areas of the basins within the City are already heavily developed. Any remaining areas with the potential for development will need to meet similar requirements as this proposed project (with critical areas avoidance, minimization, mitigation, silt fencing, and/or other conservation measures, etc.), and as such impacts would be minimized. Areas of the basin within Whatcom County are zoned for less intensive land uses. However, where development does occur similar requirements would need to be met – avoidance, minimization, mitigation, etc. as described in the Whatcom County Critical Areas Ordinance.

6.2 BUFFER IMPACTS

Buffer impacts, via buffer reduction, are proposed for Wetland A, C, D, E, G and I. MES calculated buffer impacts to the outer 25 percent of the standard buffers for Category III wetlands and the outer 50 percent of the buffer for Category IV wetlands. The buffer impacts were based on a buffer measured from the edge of undisturbed wetland, at the edge of proposed indirect impacts (indirectly impacted wetland was not buffered). Total proposed buffer impacts are 66,575 square feet.

Per City of Bellingham Code (16.55.340.C.2) buffers may be reduced with the following conditions:

a. The buffer of a Category I wetland shall not be reduced;

   Not applicable.

b. The buffer reduction shall not adversely affect the functions and values of the adjacent wetlands;

   The buffer reduction proposed, to Wetlands A, C, D, E, G and I, is not anticipated to adversely affect the wetlands. Remaining areas of buffer are in good condition, with forest habitat, providing a high level of function. Additionally, areas of impacted buffer proposed for development will include stormwater treatment and control – such that

no increased stormwater impacts are anticipated within areas of reduced buffer. A large portion of the buffer impacts are either downgradient of adjacent to the wetland – such that the area of reduced buffer does not drain to the wetland. Additionally, a large area of buffer onsite will be enhanced, Wetland A and B buffers. This will increase wetland buffer function to the two largest wetlands by replacing Himalayan blackberry, fill, rubble and gravel with native trees and shrubs.

c. The buffer of a Category II or III wetland shall not be reduced to less than 75 percent of the required buffer or 50 feet, whichever is greater;

   The Wetland A, C, D and E buffers are proposed for a 75 percent reduction in some areas of the project, to 112.5 feet.

d. The buffer of a Category IV wetland shall not be reduced to less than 50 percent of the required buffer, or 25 feet, whichever is greater, provided the buffer reduction does not result in reducing the functions and values of the wetland; and

   The Wetland G and I buffers are currently 50 feet (Category IV wetlands). These are proposed for a 50 percent reduction to 25 feet. As described above, these are not anticipated to result in a reduction of functions and values of these wetlands.

e. The applicant implements all reasonable measures to reduce the adverse effects of adjacent land uses and ensure no new loss of buffer functions and values. The specific measures that shall be implemented include, but are not limited to, the following:

   i. Direct lights away from the wetland and buffer;

      As feasible, and allowed in City Code, lights will be directed away from onsite wetlands and buffers.

   ii. Locate facilities that generate substantial noise (such as some manufacturing, industrial and recreational facilities) away from the wetland and buffer;

      No manufacturing or significant noise producing uses are proposed for the site.

   iii. Implement integrated pest management programs;

      Integrated pest management will be integrated as feasible and practicable.

   iv. Infiltrate or treat, detain and disperse runoff into buffer;

      Stormwater runoff from proposed development will meet City of Bellingham requirements of treatment, detention and dispersal.

v. Construct a wildlife permeable fence around buffer and post signs at the outer edge of the critical area or buffer to clearly indicate the location of the critical area according to the direction of the City;

A split rail fence and signage will be constructed at the edge of the proposed buffer adjacent to areas proposed for residential construction.

vi. Plant buffer with "impenetrable" native vegetation appropriate for the location;

Most of the buffers onsite are in good condition with forest habitat. Buffer planting will occur in areas that are temporarily disturbed during project construction and in buffers areas that currently contain Himalayan blackberry, gravel and rubble piles.

vii. Use low impact development techniques to the greatest extent possible;

Low impact development techniques will be implemented to the extent possible.

viii. Establish and record a permanent conservation easement to protect the wetland and the associated buffer and restrict the use of pesticides and herbicides in the easement.

A permanent conservation easement will be established for the wetlands and proposed buffers onsite.

6.3 HABITAT CONSERVATION AREA IMPACTS

The habitat conservation areas on the development property include a seasonal, non-fish stream; potential bat habitat; priority snags and logs; and biodiversity areas.

Stream. A small portion of a seasonal, non-fish stream (within the eastern portion of Wetland A) will be directly impacted from the construction of the site access road. This portion of the stream will be placed within a large box culvert. This area of fill was tabulated as Wetland A direct fill. No changes are proposed to the stream channel.

Priority Snags and Logs. A portion of the project will remove areas of mixed deciduous/coniferous forest, which may necessitate the removal of several snags and potential big brown bat habitat. However, large tracts of forest, including forested wetlands, will be preserved on the east and south sides of the property – approximately 60 percent of the property will be preserved.

Bat Habitat. Bat species may utilize forest areas for roosting or foraging. However, a significant amount of bat habitat will be left onsite as approximately 60 percent of the property, and forest area, will remain undeveloped.

Biodiversity Areas. The steep areas in the north center of the property designated as biodiversity areas will not be impacted by the project.

The City of Bellingham has identified a wildlife habitat patch over the property. This patch will be impacted with the proposed construction of an access road and residential development in the northwest portion of the property – removing a portion of the habitat patch with the conversion of forest area to residential.

The proposed project will separate the patch into two smaller patches. The southern portion will extend offsite, connecting with the offsite portion of the patch to the north of Montgomery Road and the portion of the patch south of Montgomery Road. The connection to the offsite portion of the patch at the southwest corner of the project site is approximately 200 feet wide. The southern portion of the patch offsite also will still connect with the mapped important wildlife corridor. This patch will still meet the high quality habitat standard described in the City of Bellingham Wildlife Corridor Analysis – highest quality natural areas have little disturbance and are generally larger than 20 acres in size forming continuous natural areas with little urban influence. These areas provide interior forest that is away from the influences of urban development. The portion of the patch comprising Wetland A and buffers will still extend offsite to the east, will comprise an area approximately 38 acres in size and will retain significant interior forest area with little urban influence. The proposed site access road will separate this habitat block from the Wetland C block in the northeast portion of the site. However, this area (Wetland C and buffers) will be approximately 11 to 12 acres in size, with interior forest area separated from urban influence. The site access road would not be a significant barrier for wildlife. Wildlife will still be able to travel from the Wetland A habitat block to the Wetland C habitat block. In comparison, the mapped important wildlife corridor to the west of the overall habitat block extends over open area, residences and James Street.

While the construction of residential development and access within this habitat patch will decrease the habitat block in size and separate a portion, the remaining habitat will still be a high functioning habitat patch. Approximately 60 percent of the property will be preserved.

City of Bellingham Urban Forest. The existing subject property is 36.22 acres in size, with a majority of it containing forest habitat – approximately 33 acres. Approximately 3 acres of the property includes the existing road and gravel/rubble areas. The forest habitat present is a mixture of deciduous forest, within wetland areas, and coniferous forest within remaining upland areas of the property. The proposed project will remove approximately 40 percent of the forest habitat onsite – leaving 60 percent of the property in forest or planted forest. The portion currently not forested outside of the development footprint, would be incorporated into the mitigation plan and planted with native trees and shrubs.

Currently, as documented in the City of Bellingham State of the Urban Forest Report (Diamond Head Consulting, 2022) approximately 40 percent of the City contains forest habitat. Specifically, the project is within the King Mountain neighborhood which has the highest percentage of forest in the northern portion of the City – 53 percent. The current project will leave 60 percent of the property in forest or developing forest. This exceeds the average in the City and the average in the King Mountain neighborhood. While there is a loss in forest habitat, the amount of forest preservation onsite well exceeds the City and neighborhood

average's. As such, the project is not expected to significantly impact urban forest in the City of Bellingham.

7.0 TREE RETENTION PLAN

Due to the size of the project area, individual trees were not mapped. As almost the entire property is forested, areas with proposed development will remove existing trees. The applicant will retain trees as possible within single family lots in the development footprint. Additionally, the proposed mitigation includes the planting of wetland and buffer area with native trees and shrubs – including approximately 978 native trees. These trees will be planted within critical area and buffer that currently contains rubble fill or Himalayan blackberry. These trees will be located within an area protected by a conservation easement, split rail fencing and critical areas protection signs. As a component of mitigation, the tree re-plantings will be maintained and monitored intensively for a 10 year period.

8.0 MITIGATION

In order to construct a residential development providing housing and associated infrastructure in the City of Bellingham, 1,102 square feet of direct wetland impacts, 49,775 square feet of indirect wetland impacts, 66,575 square feet of buffer impacts and 7,555 square feet of temporary impacts are proposed.

Proposed mitigation is shown below on **Table 3**. The mitigation consisting of wetland creation and preservation, is allowed per BMC 16.55.350.B.4 – where wetland preservation in combination with other forms of mitigation is allowed. Buffer enhancement will also occur within the mitigation area. The ratios utilized for preservation follow the current Ecology guidance (Ecology, 2021).

Table 3: Proposed Impacts and Mitigation

Resource	Type of Impact	Impact Area (square feet)	Mitigation Type and Ratio (Mitigation:Impact)	Mitigation Area
Wetland A Cat II[1]	Direct	1,040	Creation 3 to 1	3,120 square feet of wetland creation
Wetland A Cat II	Indirect	31,905	Creation 1 to 1 (18,824 sf of impact) Preservation 6 to 1 (13,081 sf of impact)	28,236 square feet of wetland creation; 78,486 square feet of wetland preservation
Wetland C Cat III	Indirect	3,697	Creation 1 to 1 and preservation 4 to 1 (50/50)	1,848 square feet of wetland creation; 7,394 square feet of wetland preservation
Wetland D Cat III	Indirect	6,782	Creation 1 to 1 and preservation 4 to 1 (50/50)	3,391 square feet of wetland creation; 13,564 square feet of wetland preservation
Wetland E Cat III	direct	62	Creation 2 to 1	124 square feet of wetland creation
Wetland E Cat III	Indirect	6,561	Creation 1 to 1 and preservation 4 to 1 (50/50)	3,281 square feet of wetland creation; 13,122 square feet of wetland preservation
Wetland G Cat IV	Indirect	196	Creation 0.75 to 1 and preservation 3 to 1 (50/50)	73 square feet of wetland creation; 294 square feet of wetland preservation
Wetland I Cat IV	Indirect	634	Creation 0.75 to 1 and preservation 3 to 1 (50/50)	238 square feet of wetland creation; 951 square feet of wetland preservation
Wetland buffers	Direct	66,575	Buffer enhancement 1 to 1	Enhance 96,407 square feet of buffer
Total:	**Direct (wetland) = 1,102 square feet (0.025 acre) Indirect (wetland) = 49,775 square feet (1.14 acres) Direct (buffer) 66,575 square feet (1.53 acres)**		**Total Wetland Creation= 40,819 (0.937acre) Total Wetland Preservation = 114,816 (2.64 acres) – only 113,811 square feet needed Total Buffer Enhancement 92,430 square feet (2.12 acres)**	

[1] Impacts to the onsite stream are included within Wetland A direct impacts

Direct wetland impacts will be offset with wetland creation at a 3 to 1 ratio for Category II wetlands (Wetland A) and wetland creation at a 2 to 1 ratio for Category III wetlands (Wetland E).

Indirect impacts will be offset with a mixture of wetland creation and preservation. Per Ecology guidance and City of Bellingham direction, indirect impacts will be offset at half the standard mitigation ratios. Accordingly, Category II wetlands will be offset with wetland creation at a 1.5 to 1 ratio and preservation at a 6 to 1 ratio (per current Ecology guidance). Wetland A indirect impacts were balanced at 59 percent by wetland creation and 41 percent by preservation. Indirect impacts to Category III wetlands will be offset at a 1 to 1 ratio for wetland creation, half the standard ratio, and a 4 to 1 ratio for preservation – half the standard Ecology ratio. Category IV wetlands will be offset at a 0.75 to 1 ratio for wetland creation and a 3 to 1 ratio for preservation.

A portion of a stream, within Wetland A, will be placed under a large box culvert under the access road. This area was tabulated as Wetland A direct fill and mitigated as described above by offsetting Wetland A direct impact.

Buffer impacts, totaling 66,575 square feet, will be offset with 92,430 square feet of buffer enhancement.

Temporary impacts to Wetland A buffers, 7,555 square feet in size, will be restored with the planting of native trees and shrubs.

Hydrology functions will be maintained within the indirect wetland impact areas by maintaining hydrologic connectivity with upgradient areas. Significant water quality impacts are not anticipated within indirect wetland impact areas as all pollutant generating surfaces will be collected and treated per current Department of Ecology stormwater standards.

The mitigation areas are shown on the mitigation map (W3) in **Appendix A**.

8.1 MITIGATION SEQUENCING (BMC 16.55.250)

1. **Avoid the impact**. The subject property contains numerous wetlands, including two very large wetlands, buffers and steep slopes. In order to build high density residential units and infrastructure, wetland and buffer impacts cannot be avoided. All of the direct impacts and a majority of indirect impacts are from the construction of the site access road and the stormwater pond. The site layout was altered numerous times to avoid impacting as many wetlands as possible. The current level of impacts cannot be avoided while providing access and stormwater retention for proposed development on the site.

2. **Minimize the impact**. Impacts to the onsite wetlands were minimized through numerous design iterations, including the shifting of the site access road eastward to reduce direct and indirect wetland impacts and the elimination of lots over Wetlands I and G.

3. **Rectify the impact**. Any temporary impacts to wetlands or buffers that occur with construction will be restored.

4. **Minimize or eliminate the hazard**. No hazards are located on the property.

5. **Reduce or eliminate the impact or hazard**. No hazards are located on the property.

6. **Compensate for impacts**. Compensation for wetland and buffer impacts will include onsite wetland creation – expanding Wetland A on the north side; and wetland preservation. Compensation for buffer impacts will include buffer enhancement onsite within portions of the Wetland A and C buffer that currently consist of Himalayan blackberry. Trees, shrubs, and groundcover will be added to increase diversity within the buffer.

7. **Monitor the hazard or other required mitigation**. The proposed mitigation, including wetland creation and buffer enhancement, will be monitored for ten years, per this mitigation plan.

8.2 MITIGATION SITE SELECTION AND DESCRIPTION

The proposed onsite mitigation includes wetland creation, wetland preservation and buffer enhancement. This mitigation is generally on the eastern side of the property, associated with the larger wetlands (Wetlands A and C).

Wetland creation is proposed on the northern side of Wetland A, where a large amount of concrete blocks and rubble fill were deposited in the past. This area currently provides almost no buffer function. The proposed creation, will include the removal of the fill, excavation of the soil underneath, to a grade proximate or slightly lower than the existing adjacent wetland. If needed, based on subsoils, the final grade will be over excavated and clay soils will be placed as a base layer. A layer of topsoil will also be placed over the area, and mulch will be placed over that. Native trees and shrubs will then be installed in the fall or winter (bare-root) or early spring. The proposed vegetation class in the wetland creation area is forested – as this will replace impacts proposed to forested wetland (direct and indirect). The creation area will consist of seasonally saturated area and seasonally ponded area. The proposed creation area will match adjacent portions of Wetland A to the southwest, with the anticipation that the excavated area will intercept groundwater, subsurface water and overland flow moving eastward from the area east of the wetland – as appears to be happening all along the west side of Wetland A and Wetland C. Upslope areas will still drain to the wetland creation area. Cross culverts are located under the site access road to maintain existing hydrologic pathways. A proposed wetland creation area grading plan is included in **Appendix A, Sheet W4**.

This proposed wetland creation area will have a 115-foot planted buffer along the north side, between the creation area and the site access road. Removing the prior rubble fill and creating wetland will provide a significant increase in water quality functions to the basin. The adjacent

access road will not contribute stormwater through the buffer and is parallel to the buffer – such that lights from cars will not be directed into the created wetland. Thus, the lower proposed buffer width is reasonable to protect the adjacent wetland creation area.

Wetland preservation is proposed over portions of Wetland A not in proximity to property boundaries (perimeter buffer). The area proposed for preservation includes components of large forested wetlands that drain to Baker Creek, a tributary of Squalicum Creek in Bellingham.

Proposed buffer enhancement will occur in areas between Wetland A, the wetland creation area and the site access road that are currently covered with rubble fill and areas on the west side of Wetland C, currently dominated by Himalayan blackberry.

A split-rail fence and critical areas protection signage will be located around the final proposed critical areas and buffers, as shown in **Appendix A**.

8.3 HAZARD TREE CONTINGENCY

The proposed project, will be located adjacent to existing wetland and buffer forest habitat in some areas. Potential future hazard trees may require removal. If a potential hazard tree presents a potential problem for the proposed development, the applicant will follow City of Bellingham Code Section 16.55.080.C.6. This applies to the removal and/or pruning of hazard trees within critical areas or their buffers. Per the code section, any potential hazard tree will be reviewed by an ISA (International Society of Arboriculture)-certified arborist. The arborist will prepare a report including a risk assessment, a site plan showing the location of the trees, and a replacement plan. This report will be reviewed the City Director. The applicant shall replace any cut tree with three native replacement trees (3 to 1 replacement ratio), unless determined otherwise by the Director, within six months of cutting. The applicant shall provide documentation to the City demonstrating that the replacement plantings were installed within six months of the tree removal. Cut trees and other vegetation may be left within the critical area or buffer where it does not pose a public threat or nuisance or damage significantly the surrounding vegetation.

8.4 MITIGATION GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS

This mitigation plan has been designed to replace lost wetland and buffer function due to proposed project-related impacts. During monitoring activities, performance standards will be measured to ensure the site is meeting the Goals and Objectives of the mitigation project. These standards are the primary factors that will be used to judge the success of the mitigation project. While specific performance criteria provide important benchmarks and will help to direct maintenance and contingency efforts, the mitigation goals must also be considered when evaluating mitigation success.

Goal A: Improve buffer function and wildlife habitat in onsite portion of Wetland A and C buffers.

Objective A: Enhance 92,430 square feet of Wetland A and C buffer by removing invasive species and/or fill and planting native trees and shrubs.

Performance Standard A.1: 90-percent planting survival at Year 1, selected from **Table 6**. This can be assessed by sampling (plot or transect).

Performance Standard A.2: There will be at least 10, 15, 30, 50 and 75 percent aerial cover of native shrub or tree species (excluding cover by invasive species) in the enhancement area by the end of Years 2, 3, 5, 7 and 10 respectively. This will be measured by sampling, via plot or line transect.

Performance Standard A.3: Aerial cover of noxious weed species within the mitigation planting area shall not exceed 15-percent in any monitoring year. Noxious weeds are listed by the Whatcom County Noxious Weed Control Board. Commonly found noxious weeds in this area that could threatened the success of the mitigation area are listed in **Table 4**.

Table 4: Non-native, Invasive Species that Must Be Removed

Scientific Name	Common Name
Phalaris arundinacea	Reed canarygrass
Hedera helix	English Ivy
Polygonum cuspidatum	Japanese knotweed
Rubus lacinatus	Cutleaf blackberry
Rubus armeniacus	Himalayan blackberry

Performance Standard A.4: At least two species of trees and four species of shrubs shall be represented in the enhancement area.

Goal B: Replace lost wetland function by creating new wetland area adjacent to Wetland A.

Objective B: Create 40,819 square feet of wetland by removing fill and excavating upland soils adjacent to Wetland A to match the topography of Wetland A. Mulch will be spread over the area and native trees and shrubs will be planted over the area.

Performance Standard B.1: 90-percent planting survival at Year 1, selected from **Table 5.** This can be assessed by sampling (plot or transect).

Performance Standard B.2: There will be at least 10, 15, 30, 50 and 75 percent aerial cover of native shrub or tree species (excluding cover by invasive species) in the enhancement area by the end of Years 2, 3, 5, 7 and 10 respectively. This will be measured by visually estimating aerial cover.

Performance Standard B.3: Less than 15 percent aerial cover of non-native invasive species (**Table 4**) within the creation area;

Performance Standard B.4: At least two species of trees and four species of shrubs shall be represented in the enhancement area.

Performance Standard B.5: The wetland creation area shall meet wetland hydrology criteria in every monitoring year, as defined by the US Army Corps of Engineers in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps, 2010).

Performance Standard B.6: The wetland creation area shall exhibit hydric soils by Year 5, as defined in the *Field Indicators of Hydric Soils in the United States* (USDA, 2018).

Performance Standard B.7: The wetland creation area shall meet a hydrophytic vegetation indicator in every monitoring year as defined by the US Army Corps of Engineers in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps, 2010).

Goal C: Restore temporarily disturbed buffer function and wildlife habitat in onsite portion of Wetland A buffer.

Objective C: Restore 7,555 square feet of Wetland A buffer by planting native trees and shrubs.

Performance Standard C.1: 90-percent planting survival at Year 1, selected from **Table 7**. This can be assessed by sampling (plot or transect).

Performance Standard C.2: There will be at least 10, 15, 30, 50 and 75 percent aerial cover of native shrub or tree species (excluding cover by invasive species) in the enhancement area by the end of Years 2, 3, 5, 7 and 10 respectively. This will be measured by sampling, via plot or line transect.

Performance Standard C.3: Aerial cover of noxious weed species within the mitigation planting area shall not exceed 15-percent in any monitoring year. Noxious weeds are listed by the Whatcom County Noxious Weed Control Board. Commonly found noxious weeds in this area that could threatened the success of the mitigation area are listed in **Table 4**.

Performance Standard C.4: At least two species of trees and four species of shrubs shall be represented in the enhancement area.

8.4.1 Wetland Creation Methods

The wetland creation area, totaling 40,819 square feet in size will be excavated to achieve a similar final grade as the existing northern portion of Wetland A. This will include the removal of the rubble fill pile over the area.

The side slopes adjacent to the wetland creation area will also be graded (within the buffer), due to the topography of this area, to achieve gentler side slopes (2:1). The wetland creation area shall be over-excavated by one to two feet and backfilled with clay or silt soil fill (if needed) and one foot of topsoil – to achieve the final grades. During soil excavation, soils will be evaluated by the wetland biologist to determine if clay or silt soils are needed. Topsoil from the property may be used from graded areas proposed for development. The entire wetland creation area shall be mulched with three to four inches of wood chip mulch. Native trees and shrubs will then be installed during the appropriate planting season: January/February for bare root, early spring or fall for container plants.

All plant materials used at the mitigation site shall be grown in the Puget Sound lowlands. Each plant shall be flagged with bright colored flagging to assist with annual monitoring. Plants shall be selected from the table below.

Table 5: Planting List for Wetland Creation Area 40,819 square feet

Scientific Name	Common Name	Size/Condition[1]	Spacing
Populus tremuloides	Quaking aspen	1-2 Gal or bareroot	12 feet
Picea sitchensis	Sitka spruce	1-2 Gal or bareroot	12 feet
Picea sitchensis	Shore pine	1-2 Gal or bareroot	12 feet
Thuja plicata	Western red-cedar	1-2 Gal or bareroot	12 feet
Total Trees = 283 (choose at least 2 or more species)			
Rosa nutkana	Nootka rose	1-2 Gal or bareroot	5 feet
Rubus spectabilis	Salmonberry	1-2 Gal or bareroot	5 feet
Lonicera involucrata	Black twinberry	1-2 Gal or bareroot	5 feet
Salix hookeriana	Hooker willow	1-2 Gal or bareroot	5 feet
Cornus sericea	Red-osier dogwood	1-2 Gal or bareroot	5 feet
Salix lasiandra	Pacific willow	1-2 Gal or bareroot	5 feet
Salix sitchensis	Sitka willow	1-2 Gal or bareroot	5 feet
Physocarpus capitatus	Pacific ninebark	1-2 Gal or bareroot	5 feet
Malus fusca	Western crabapple	1-2 Gal or bareroot	5 feet
Total Shrubs = 1,349 (choose at least 4 or more species)			

[1]Bare root plantings should be planted December to March – the dormant period.

8.4.2 Buffer Enhancement Methods

Approximately 92,430 square feet of the Wetland A and C buffer will be enhanced. This will include the removal of rubble fill over portions of the buffer.

Prior to installing native plants, invasive species will be removed from the buffer area. The entire buffer enhancement area shall be sheet mulched to a depth of three to four inches.

At least two different tree species and four different shrub species shall be chosen from **Table 6** and planted in the buffer enhancement area. All plant materials used at the mitigation site shall be grown in the Puget Sound lowlands. Each plant shall be flagged with bright colored flagging to assist with annual monitoring. Plants shall be selected for the enhancement areas (**Appendix A**) from the table below.

Table 6: Planting List for Buffer Enhancement Area 92,430 square feet

Scientific Name	Common Name	Size/Condition[1]	Spacing
Pseudotsuga menziesii	Douglas fir	1-2 Gal or bareroot	12 feet
Picea sitchensis	Sitka spruce	1-2 Gal or bareroot	12 feet
Abies grandis	Grand fir	1-2 Gal or bareroot	12feet
Prunus emarginata	Bitter cherry	1-2 Gal or bareroot	12 feet
Betula papyifera	Paper birch	1-2 Gal or bareroot	12 feet
Acer macrophyllum	Big-leaf maple	1-2 Gal or bareroot	12 feet
Total Trees = 642 (choose at least 2 or more species)			
Symphoricarpos albus	Snowberry	1-2 Gal or bareroot	5 feet
Acer circinatum	Vine maple	1-2 Gal or bareroot	5 feet
Corylus cornuta	Hazelnut	1-2 Gal or bareroot	5 feet
Ribes sanguineum	Red-flowering currant	1-2 Gal or bareroot	5 feet
Rosa nutkana	Nootka rose	1-2 Gal or bareroot	5 feet
Holodiscus discolor	Oceanspray	1-2 Gal or bareroot	5 feet
Oemleria cerasiformis	Indian plum	1-2 Gal or bareroot	5 feet
Amelanchier alnifolia	Saskatoon	1-2 Gal or bareroot	5 feet
Rubus parviflorus	Thimbleberry	1-2 Gal or bareroot	5 feet
Rhamnus prushiana	Cascara	1-2 Gal or bareroot	5 feet
Rubus spectabilis	Salmonberry	1-2 Gal or bareroot	5 feet
Total Shrubs = 3,055 (choose at least 4 or more species)			

[1]Bare root plantings should be planted December to March – the dormant period.

8.4.3 Buffer Restoration Methods

Approximately 7,555 square feet of Wetland A buffer will be temporarily disturbed with the construction of the site access road and the stormwater pond.

Prior to installing native plants, invasive species will be removed from the buffer area. The entire restoration area shall be sheet mulched to a depth of three to four inches.

At least two different tree species and four different shrub species shall be chosen from **Table 7** and planted in the buffer restoration area. All plant materials used at the mitigation site shall be grown in the Puget Sound lowlands. Each plant shall be flagged with bright colored flagging to assist with annual monitoring. Plants shall be selected for the enhancement areas (**Appendix A**) from the table below.

Table 7: Planting List for Buffer Restoration Area 7,555 square feet

Scientific Name	Common Name	Size/Condition[1]	Spacing
Pseudotsuga menziesii	Douglas fir	1-2 Gal or bareroot	12 feet
Picea sitchensis	Sitka spruce	1-2 Gal or bareroot	12 feet
Abies grandis	Grand fir	1-2 Gal or bareroot	12feet
Prunus emarginata	Bitter cherry	1-2 Gal or bareroot	12 feet
Betula papyifera	Paper birch	1-2 Gal or bareroot	12 feet
Acer macrophyllum	Big-leaf maple	1-2 Gal or bareroot	12 feet
Total Trees = 52 (choose at least 2 or more species)			
Symphoricarpos albus	Snowberry	1-2 Gal or bareroot	5 feet
Acer circinatum	Vine maple	1-2 Gal or bareroot	5 feet
Corylus cornuta	Hazelnut	1-2 Gal or bareroot	5 feet
Ribes sanguineum	Red-flowering currant	1-2 Gal or bareroot	5 feet
Rosa nutkana	Nootka rose	1-2 Gal or bareroot	5 feet
Holodiscus discolor	Oceanspray	1-2 Gal or bareroot	5 feet
Oemleria cerasiformis	Indian plum	1-2 Gal or bareroot	5 feet
Amelanchier alnifolia	Saskatoon	1-2 Gal or bareroot	5 feet
Rubus parviflorus	Thimbleberry	1-2 Gal or bareroot	5 feet
Rhamnus prushiana	Cascara	1-2 Gal or bareroot	5 feet
Rubus spectabilis	Salmonberry	1-2 Gal or bareroot	5 feet
Total Shrubs = 250 (choose at least 4 or more species)			

[1]Bare root plantings should be planted December to March – the dormant period.

8.4.3 Mitigation Installation Timeline/Schedule

A general outline and schedule for the implementation of the mitigation is as follows:

1) Pre-construction meeting with City staff, contractor and wetland biologist;

2) Identify mitigation work area boundaries with temporary fencing, silt fence, or markers;

3) Remove rubble and fill from the mitigation areas;

4) Excavate the wetland creation area, with over excavation and placement of clay (as needed) and topsoil to reach the final grade. Wetland biologist must review the excavation prior to spreading the clay (if needed) and topsoil;

5) Clear Himalayan blackberry/reed canarygrass and other invasive plant species from buffer enhancement areas;

6) Install mulch in the wetland creation area, buffer enhancement area and restoration area;

7) Install native trees and shrubs;

8) Remove temporary work fencing and/or markers;

9) Install split-rail fencing around the development footprint (as shown on the mitigation map; and

10) Install critical areas protection signs adjacent to the development footprint, as shown on the mitigation map.

Steps one through six will be completed concurrent with construction of the proposed project.

Plant installation, step seven, should occur in the winter (if bare root plants are used), early spring or fall (if container plants are used). The remaining steps, eight to ten, would occur concurrently or after planting.

8.4.4 Mitigation As-Built

Once the mitigation is complete, an as-built drawing and letter shall be prepared with site photographs documenting completion of mitigation installation. The as-built shall be submitted to:

City of Bellingham
Planning and Community Development Department

US Army Corps of Engineers
NWS.Compliance@usace.army.mil

8.4.5 Critical area Site Protection

The outer edge of the final proposed buffers around onsite wetlands/buffers, including the mitigation area shall be demarcated by a split rail fence and Critical Areas Protection signs – as shown on the mitigation sheet (W3) in **Appendix A**. Fencing and signage is located between proposed residential areas and wetland buffers.

8.4.6 Mitigation Area Long Term Post-Monitoring Care

Long term post monitoring care of the mitigation areas, both offsite and onsite, will continue indefinitely following the completion of the 10-year monitoring program per U.S. Army Corps of Engineers requirements.

8.5 MONITORING AND MAINTENANCE

8.5.1 Monitoring Activities and Reports

The mitigation area shall be monitored for ten years, following the completion of mitigation installation and approval of the as-built report, monitoring reports shall be submitted to the City of Bellingham in years 1, 2, 3, 4, and 5 and the Corps in years 1, 2, 3, 5, 7 and 10

beginning one growing season after the as-built drawings are accepted. Reports shall be due by December 31 of the monitoring year.

Monitoring reports will assess both attainment of yearly target success criteria and progress toward final success criteria. These reports shall include the survival and/or replacement of tree and shrub species, invasive species coverage, and diversity data, as outlined in the Performance Standards.

8.5.2 Monitoring Methods

Monitoring shall be accomplished by sampling (plots or transect) the mitigation planting areas in the monitoring year.

Photographs of the mitigation should be included to document representative areas of the mitigation site.

8.6 MAINTENANCE ACTIVITIES

The purpose of this maintenance program is to ensure the success of the mitigation plantings. Maintenance will occur over the life of the required monitoring. Non-native/invasive plant species that must be removed are outlined in the performance standards.

Plant removal occurring after installation will be completed by hand (hand power tools or other). All invasive plant material removed must be properly disposed of off-site.

These maintenance guidelines are specifically tailored for native plant establishment. The maintenance personnel will be fully informed regarding the habitat establishment program so they understand the goals of the effort and the maintenance requirements. A landscape contractor with experience and knowledge in native plant habitat restoration is recommended to perform all mitigation maintenance.

8.7 COMPLETION OF MITIGATION

8.7.1 Notification of Completion

The applicant shall notify the City of Bellingham and the Corps in writing when the monitoring period is complete and the agency-approved success criteria have been met. If the agencies determine that the project meets all success criteria at the end of the monitoring period, the mitigation plan will be considered a success. If not, the agencies will be consulted and must approve contingency measures prior to implementing changes to the plan. Only those areas that fail to meet the success criteria will require additional monitoring. This process will continue until all performance standards are met or until the City or Corps determine that other revegetation measures are appropriate.

8.7.2 Contingency Plan

If a performance standard is not met for all or any portion of the mitigation project in any year, or if the approved success criteria are not met, an analysis of the cause(s) of failure shall be prepared and, if determined necessary by the City and Corps, the applicants' maintenance and monitoring obligations shall continue until the agencies give final approval the mitigation obligations have been satisfied.

The contingency plan will provide for the remediation of aspects of the mitigation that have prevented the achievement of mitigation goals. If the desired mitigation goals, as measured by the monitoring program and compared against the performance standards, have not been met and cannot be achieved through routine maintenance, then the agencies and the applicant will make a joint determination on a suitable contingency plan. If the contingency plan is substantial, the agencies could extend the monitoring period.

8.7.3 Financial Guarantee

A mitigation bond or assignment of savings will be submitted to the City of Bellingham Planning and Community Development in the amount of 150 percent of the estimated cost of mitigation installation, maintenance, and monitoring. The bond is required for the City of Bellingham and so is based on the City required 5 years of monitoring. Monitoring for the Corps will continue to Year 10. The estimated costs include:

- Earthwork: removal of fill and rubble 25,000 cy at $18 cubic yard - $450,000
- Mulch: 1,780 cubic yards at $25 cy - $43,450
- plants cost and install: 5,632 plants at $8.50 each - $47,872
- Split rail fence: 1,035 linear feet at $12.00 per linear foot - $12,420
- Signs: 12 signs at $50 each - $600
- Completion of an as-built report by a biologist: $1,000
- Maintenance costs: $1,500/year x 7 years - $7,500
- Monitoring: $1,440/year x 7 monitoring events - $7,200

The total estimated cost is $570,042. The total surety amount (cost x 150-percent) is **$855,063**.

9.0 REFERENCES

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