

Critical Areas Report and Mitigation Plan

City of Snohomish Everett Conveyance Project

Snohomish County

October 2011

Prepared for

City of Snohomish

Prepared by

CH2MHILL

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Abbreviations and Acronyms

APE	area of potential effect
BNSF	Burlington Northern Santa Fe railroad
Ecology	Washington Department of Ecology
HDD	horizontal directional drilling
PEM	palustrine emergent marsh (wetland)
PFO	palustrine forested (wetland)
Project	City of Snohomish Everett Conveyance Project
PSS	palustrine scrub-shrub (wetland)
SCC	Snohomish County Code
SMC	Snohomish Municipal Code
EMC	Everett Municipal Code
USACE	U.S. Army Corps of Engineers
WAC	<i>Washington Administrative Code</i>
WRIA	Water Resource Inventory Area
WWTP	wastewater treatment plant

Glossary

Dominant species – The species controlling the environment (Cowardin et al. 1979). In wetland science, this is often measured by the percent of total plant cover.

Emergent - Erect, rooted, herbaceous plants that may be temporarily to permanently flooded at the base but do not tolerate prolonged inundation of the entire plant (Cowardin et al. 1979).

Hydrogeomorphic (HGM) classification - A wetland classification system based on the landscape position of a wetland along with the source of water and its movement within a wetland (Brinson 1993).

Hydrophytic vegetation - The sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. When hydrophytic vegetation comprises a community where indicators of hydric soils and wetland hydrology also occur, the area has wetland vegetation (USACE 1987).

Invasive species – Defined by the National Invasive Species Council as “(1) a non-native (alien) to the ecosystem under consideration and (2) a species whose introduction is likely to cause economic or environmental harm, or harm to human health” (Executive Order 13112) (Washington Department of Ecology [Ecology] et al. 2006).

Jurisdiction - A municipal government agency, such as a city or county, and, as appropriate, federal and state agencies and federally recognized tribes.

Jurisdictional wetlands - All naturally occurring wetlands, some wetlands unintentionally created as the result of construction activities, and those wetlands created specifically for the compensation of wetland losses. These wetlands are regulated by the Army Corps of Engineers and local jurisdictions. Ditches created in non-wetland areas that support wetland vegetation are not usually considered wetlands.

Mitigation sequencing – A prescribed order of steps taken to reduce the impacts of activities on wetlands. Mitigation sequencing involves:

- (1) Avoid the impact altogether by not taking a certain action or parts of an action;
- (2) Minimize the effects by limiting the degree of an action;
- (3) Rectify the effect by repairing or enhancing the affected environment;
- (4) Reduce or eliminate the effect over time;
- (5) Compensate for the effect by replacing or substituting resources or environments; or
- (6) Monitor the effect and take appropriate corrective measures (Ecology et al 2006).

Monitoring - The systematic evaluation of a mitigation site to determine the degree to which the site meets its performance standards and to determine if modifications in the maintenance or management of the site are necessary to achieve the ultimate success standards.

Palustrine - A site not influenced by ocean tides, or only slightly so, with persistent trees, shrubs, grasses, or mosses covering 30 percent or more of the area (Cowardin et al. 1979).

Palustrine emergent wetland - A class of palustrine wetland systems containing greater than 30 percent plant cover by predominantly vascular herbaceous plants whose height allows them to penetrate the water's surface (that is, not submerged, floating-leaved, or floating). Additional modifiers are described in the text (Cowardin et al. 1979).

Palustrine forested wetland - A class of palustrine wetland systems containing greater than 30 percent plant cover by predominantly trees or shrubs whose height exceeds 20 feet (Cowardin et al. 1979).

Riparian – Pertaining to anything connected with or immediately adjacent to the banks of a stream, river, or other water body.

Shrub - A woody plant which at maturity is usually less than 20 feet tall (Cowardin et al. 1979).

Tree - A woody plant which at maturity is usually greater than 20 feet tall (Cowardin et al. 1979).

Upland - Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands (USACE 1987).

Wetland – Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (USACE 1987).

Wetland boundary – The point on the ground at which a shift from wetlands to non-wetlands or aquatic habitats occurs. These boundaries usually follow contours (USACE 1987).

Wetland buffer – Vegetated areas adjacent to wetlands, or other aquatic resources, that can reduce impacts from adjacent land uses through various physical, chemical, and/or biological processes (Ecology et al. 2006).

Wetland delineation – The process or procedure by which an area is adjudged a wetland or non-wetland (USACE 1987).

Wetland function – The physical, biological, chemical, and geologic interactions among different components of the environment that occur within a wetland. Wetlands perform many valuable functions and these can be grouped into three categories: functions that improve water quality, functions that change the water regime in a watershed such as flood storage, and functions that provide habitat for plants and animals (Ecology 2006).

1. Introduction

The following memorandum summarizes the proposed wetland protection, restoration, and enhancement plan for the permanent and temporary wetland impacts from the proposed City of Snohomish Everett Conveyance Project (the Project). The City of Snohomish (the City) proposes to build the Project to make improvements to its wastewater treatment system by removing all of the City's existing discharge to the Snohomish River and building a sewer pump station and force main to transfer the wastewater flows to the City of Everett's Water Pollution Control Facility for treatment and discharge. The project will convey wastewater from the existing Snohomish wastewater treatment plant (WWTP) to the City of Everett's South End Interceptor at Lenora Street, which is about 5 miles northwest of the Snohomish WWTP.

The City has identified six wetlands within the proposed project footprint, five of which are located within agricultural fields and one that is located in an old sewage lagoon. The *City of Snohomish Sewer Force Main Project Wetlands and Other Waters Delineation Report* (the *Wetland Delineation Report*; CH2M HILL 2011) describes these wetlands in detail. There will be permanent impacts to the wetland identified within the old sewage lagoon and its buffer. There will also be temporary impacts to a portion of the buffer of an undelineated wetland located to the north of the WWTP. The wetland was not delineated because it is located outside of the area of potential effect (APE). No permanent impacts to the other five wetlands or other waters identified within the APE are expected to result from the proposed project. This plan has been prepared to meet the requirements for mitigation for permanent and temporary impacts to wetlands as a result of the proposed project, pursuant to City of Snohomish Code (SMC) 14.255.100 and 14.260.050, Snohomish County Code (SCC) 30.62A.150 and City of Everett Code (EMC) 19.37.110.

2. Project Description

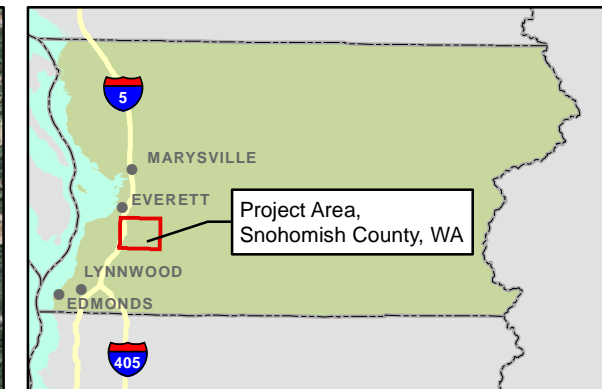
The current Snohomish WWTP is not consistently meeting water quality standards for its discharge and has limited capacity for additional flows that will be created by population growth. A long-term wastewater system improvement project is required to provide for ongoing compliance with the City of Snohomish's current and future permit requirements in light of evolving water quality standards and growth. To fulfill these requirements, the Everett Conveyance Project has proposed to make improvements to the wastewater treatment system and WWTP by removing all of the City's existing discharge to the Snohomish River and building a sewer force main and pump station to transfer the City's wastewater flows to the City of Everett's Water Pollution Control Facility for treatment and discharge. The Everett Conveyance Project will convey wastewater from the existing Snohomish WWTP, located at Slough Road and State Route 9, to the City of Everett's South End Interceptor at Lenora Street, which is about 5 miles northwest of the Snohomish WWTP (see Figure 1).

During the planning-level phase of the project, four force main alignments were developed and considered for conveying City flows to the Everett South End Interceptor. Based on the evaluation results, the South Alignment is the recommended Everett Conveyance Project alignment. A detailed discussion of alternatives considered and their reasons for elimination is included in the September 2011 Everett Conveyance Project Facility Plan (CH2M HILL 2011). The selected force main alignment to Everett would be about 26,300 feet long and would include crossing the Snohomish River and the Marshland Flood Control District canal and crossing the Burlington Northern Santa Fe railroad at two locations.

Most of the alignment would be on private property (agricultural fields) south of Lowell-Snohomish River Road and the Burlington Northern Santa Fe (BNSF) Railway tracks. The sewer force main piping will be a 20-inch diameter pipe for most of the alignment. Where the pipe is located under the waterways, it will be 16 inches in diameter. The pipe would be located up to 10 feet beneath the ground surface and would be installed via open trenching for most of the alignment. Open trenching would require the trench to be about 4 to 5 feet in width. Under the Snohomish River and Marshland Canal, the pipe would be installed via horizontal directional drilling (HDD). HDD would require an entry and exit pit about 40 feet wide by 80 feet long and at least 10 feet deep. The jack-and-bore method would be used for the two BNSF railroad track crossings. Jacking pits would be located a minimum of 30 feet from the centerline of the track and the pits would have similar dimensions to those of the HDD pits.

The proposed pump station would be located within the northeast corner of the City of Snohomish's abandoned WWTP sewage lagoon. The lagoon has been identified as a wetland and was decommissioned as a sewage lagoon about 6 years ago. Placement of the pump station was chosen to allow for gravity flow and to minimize the extent of permanent impacts to the wetland lagoon.

Construction of the pump station would require grade and fill work, as well as the removal of some vegetation (trees, shrubs, and some woody vegetation such as blackberries), to make space for the pump station. The pump station will have a footprint of about 3,000 square feet and would be located west of the existing WWTP facilities. This location will take advantage of gravity flow from the headworks and Lagoon 1 to the pump station wetwell. Some filling of the old lagoon will be needed to support the pump station. Fill would need to be placed along the top of portions of the existing berm surrounding the sewage lagoon to help support the proposed pump station. The fill would be placed along the northeast corner of the berm. Some vegetation such as willow, red alder, and blackberries would need to be removed.



- Force Main
- +— BNSF Railway
- City Boundary

Everett and Snohomish, WA 7.5' USGS Quads
 Township 28 N Range 5 E
 Sections 4, 5, 9, 10, 13, 14, and 15

Source: Color Aerial; National Agriculture Imagery Program (NAIP), 2006.

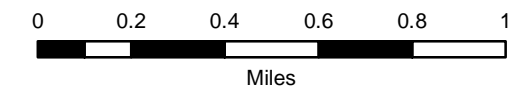


FIGURE 1
Vicinity Map
 City of Snohomish Everett Conveyance Project

3. Resource Assessment

3.1 General Site Conditions

The APE is defined as the geographic area(s) within which an undertaking may directly or indirectly cause alterations in the character or function of the landscape. The APE for this project is a corridor 150 feet wide (narrower in some locations throughout the alignment) that runs the length of the proposed force main (about 5 miles) and an area about 225 feet square for the proposed pump station. Should it be determined that ground-disturbing activities, such as for construction staging, are required that are outside of this area, additional investigation and an addendum to this report will be required.

The APE is characterized by relatively flat terrain in the Snohomish River valley, in Water Resource Inventory Area (WRIA) 7. Most of the APE is located within unincorporated Snohomish County, and runs along the south (eastbound) side of Lowell-Snohomish River Road through active agricultural fields and south of the BNSF Railway railroad tracks. Other than the railroad tracks and trestles, Lowell-Snohomish River Road, and the existing WWTP facilities, there are no structures located within the APE. The APE contains areas of actively tilled crops (including corn and beans), hay fields, and some forested vegetation (mainly within Wetland 5 and the Wetland 6 buffer area). The proposed force main will cross at least 10 drainage ditches as well as the Snohomish River. The proposed pump station will impact a small corner of Wetland 6 and its buffer. Details about these wetlands and waters are provided in the *Wetland Delineation Report* (CH2M HILL 2011).

3.2 Existing Conditions- Wetlands

Six wetlands totaling 24.67 acres were delineated within the APE (Table 1). All six wetlands extend beyond the APE and were only delineated within the APE. Four of the six delineated wetlands are located entirely within unincorporated Snohomish County; a portion of Wetland 5 (un-surveyed due to limited site access) is located in the City of Everett and Wetland 6 is located within the City of Snohomish. Five of the delineated wetlands have been heavily altered by agricultural practices including seasonal tilling, planting, and harvesting. Wetland 6 is manmade and previously used as a sewage lagoon by the City of Snohomish. The access road and berm around Wetland 6 were constructed to support the sewage lagoon and existing WWTP.

Large patches of non-native Himalayan blackberry (*Rubus armeniacus*) are also scattered throughout the APE and along the wetland boundaries and ditches. As noted in the *Wetland Delineation Report* (CH2M HILL 2011), some areas of the proposed sewer force main alignment were inaccessible due to physical barriers or landowner restrictions. For the purposes of this plan, assumptions about these areas' existing conditions are based on best available information from aerial photographs and ground observations of adjacent land.

TABLE 1
 Summary of APE Wetlands

Wetland ID	Area within APE (acres)	Hydrogeomorphic Classification ^a	Cowardin Classification ^b	Ecology Classification ^c	Standard Buffer Width (feet) ^d
1	3.09	Depressional	PEM	IV	40
2	3.94	Depressional	PEM/PSS	IV	40
3	7.31	Depressional	PEM/PSS	IV	40
4	2.60	Depressional	PEM/PSS	IV	40
5	7.27	Depressional	PEM/PFO	IV	40
6	0.46	Depressional	PEM/PFO	III	100 ^e
TOTAL	24.67				

^a Brinson 1993

^b Cowardin et al. 1979. PEM: palustrine emergent; PSS: palustrine scrub-shrub; PFO: palustrine forested

^c Washington State Wetland Rating System for Western Washington, Washington State Department of Ecology (Hruby 2004).

^d Per SCC 30.62A.150.

^e Per SMC14.260.020

Wetland 1 is located in a field used for hay production, and was vegetated with red fescue (*Festuca rubra*) grass and patches of common rush (*Juncus effusus*) and creeping buttercup (*Ranunculus repens*). Within the APE, Wetland 1's buffer is vegetated with red fescue on the north side and is paved roadway on the south side.

Wetlands 2, 3, and 4 were delineated in May 2011, at which time they were vegetated with non-native reed canarygrass (*Phalaris arundinacea*) and scattered small (less than 30 feet tall) native trees including cottonwood (*Populus balsamifera*), red alder (*Alnus rubra*), and willow (*Salix* spp.). In August 2011, Wetlands 2, 3, and 4 had been cleared of all vegetation in preparation for tilling and crop planting. The regulatory buffers of these three wetlands within the APE are either unvegetated dirt or gravel roads, tilled soil, or vegetated with planted crops and Himalayan blackberry shrubs.

Wetland 5 is vegetated with common rush (native), reed canarygrass, and a large area of mature willow and other native deciduous trees. Within the APE, its buffer is an unvegetated dirt road and tilled soil.

Wetland 6 is a palustrine emergent, depressional wetland (PEM) with a palustrine forested (PFO) component along its eastern edge. It is located in a flat depression that was created to serve as a sewage lagoon for the WWTP in the City of Snohomish. The sewage lagoon was decommissioned about 6 years ago and the area was seeded with tall fescue (*Festuca arundinacea*). The lagoon has a history of flooding when the Snohomish River overflows its banks. This wetland is connected to a spillway that is directly adjacent to the Snohomish River. The dominant vegetation in the wetland is reed canary grass and the eastern fringe is dominated

by willow trees (*Salix* sp.). Wet season precipitation appears to be the main source of hydrology for this wetland in addition to a seasonally high water table, and water remains in the wetland as a result of the topographic position.

One additional wetland was observed outside of the APE to the north of the pump station. A wetland associated with Cemetery Creek is located north of the proposed pump station and forcemain, northwest of the existing City's WWTP. This wetland was not delineated because it is located outside of the APE. The southern boundary for this wetland abuts the existing access road to the WWTP located along the northern edge of Wetland 6, which is also the buffer for Wetland 6. The buffer area is located within the APE and would be temporarily impacted by construction of the forcemain and pump station. No impacts to the Cemetery Creek wetland would occur from construction of the pump station or the forcemain and the access road buffer would be restored once construction was completed.

According to the Ecology rating system (Hruby 2004), these six wetlands provide low to moderate water quality, hydrology, and habitat functions to the surrounding landscape. There are no listed threatened or endangered species or critical habitat documented within any of these wetlands or their buffers.

3.3 Existing Conditions- Streams

Thirteen streams were mapped in the field survey corridor, twelve of which were field-surveyed. Stream 13 was identified from Snohomish County's drainage inventory (area was inaccessible for field surveys). Refer to the *Wetland Delineation Report* (CH2M HILL 2011) for complete information on the streams.

Streams 1 through 13 are ditches created for farmland drainage within the APE. The ditches are all Snohomish County type Np and Ns waterbodies, except for the Marshland Canal (Type F), and all have a connection to the Snohomish River. Type Np and Ns waterbodies are non-fishbearing waters that require a 50-foot buffer at undeveloped sites (SCC 30.62A.320). Drainage Ditch No. 1 (Thomas Creek) is located just southeast of the APE (Snohomish County Public Works 2009).

The APE intersects with the Snohomish River about 1.26 miles upstream from Possession Sound. The Snohomish River is a major river system with numerous salmon runs, some of which are substantial in size. The river is 23 miles long from the confluence of the Skykomish and Snoqualmie Rivers to Puget Sound. The Snohomish River is a Type F waterbody, according to the Snohomish Critical Areas Ordinance, that requires a 150-foot buffer at undeveloped sites. Buffer requirements are defined in SCC 30.62A.320, and stream type definitions are defined in *Washington Administrative Code* (WAC) 222.16.030. The Snohomish River is considered a shoreline of the State (WAC 173-18).

3.4 Existing Conditions - Uplands

A majority of the upland habitats in the APE are in agricultural land. Agricultural habitats are routinely disturbed and usually contain important amounts of non-native vegetation. Ongoing land uses typically preclude habitat restoration to prior conditions. For this project, the agricultural habitats include row crops, planted poplar and grass seed fields.

Wildlife associated with these habitats are edge-adapted species including deer, coyote, deer mouse, moles (for example, *Scapanus townsendii*), American crow (*Corvus brachyrhynchos*), gulls (for example, *Larus argentatus*), rock pigeon (*Columba livia*), and ring-necked pheasant (*Phasianus colchicus*). Other species that use these habitats are Canada goose (*Branta Canadensis*); savannah sparrow (*Passerculus sandwichensis*); common garter snake; and many raptor species, such as red-tailed hawks, American kestrels, and northern harriers, because of the high number of rodents.

Although current land uses preclude habitat restoration, restoration potential can be very high and successful for these habitat types.

4. Wetland Impacts

4.1 Permanent Impacts

Fill comprised of native material would be placed within the northeast corner of Wetland 6 and portions of the buffer, to allow for the support of the proposed pump station. No fill or nonnative material would be placed within any of the remaining five jurisdictional wetlands or their buffers. Permanent wetland and wetland buffer impacts are expected to result from the construction of the proposed pump station. There would be no permanent impacts to any of the other wetlands, wetland buffers, or streams within this project. Refer to the *Wetland Delineation Report* (CH2M HILL 2011) for complete information and location of the wetland impacts.

Table 2 summarizes the unavoidable permanent impacts to Wetland 6 and its regulatory buffer from construction of the proposed project. Refer to Figure 2, Sheets 1 to 4, for the location of wetland and wetland buffer impacts.

Table 2
Summary of Permanent Wetland and Buffer Impacts

Wetland ID	Area within APE (acres)	Ecology Classification ^a	Permanent Wetland Impact (acres)	Permanent Wetland Buffer Impact (acres)
6	0.46	III	0.46	0.08

Permanent impacts on wetlands and wetland buffers are defined as those impacts from construction features such as temporary access roads, temporary vegetation clearing, construction staging and stockpiling areas, and construction stormwater best management practices.

4.2 Temporary Impacts

Table 3 summarizes the unavoidable temporary impacts to wetlands and their regulatory buffers from construction of the proposed project. Refer to Figure 2, Sheets 1 to 4, for the location of wetland and wetland buffer impacts.

Table 3
Summary of Temporary Wetland and Buffer Impacts

Wetland ID	Area within APE (acres)	Ecology Classification ^a	Temporary Wetland Impact (acres)	Temporary Wetland Buffer Impact (acres)
1	3.18	IV	2.19	0.12
2	3.94	IV	1.82	
3	7.31	IV	3.24	0.86
4	2.60	IV	1.08	

Table 3
 Summary of Temporary Wetland and Buffer Impacts

Wetland ID	Area within APE (acres)	Ecology Classification ^a	Temporary Wetland Impact (acres)	Temporary Wetland Buffer Impact (acres)
5	7.27	IV	3.67	0.10
5a	0.49	IV	0.49	-
Cemetery Creek ^b	-	-	-	0.17
6	0.46	III	-	0.17
TOTAL	25.25		12.49	1.25

^a Washington State Wetland Rating System for Western Washington, Washington State Department of Ecology (Hruby 2004).

^b Wetland not delineated

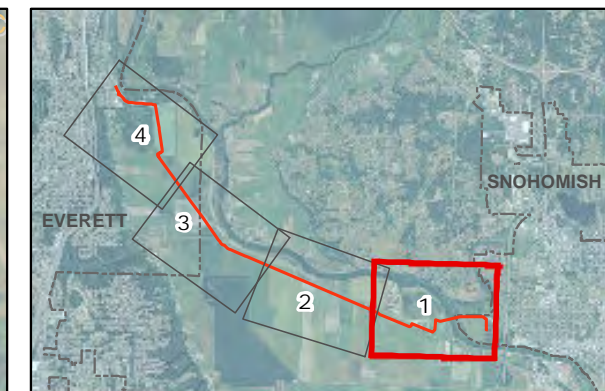
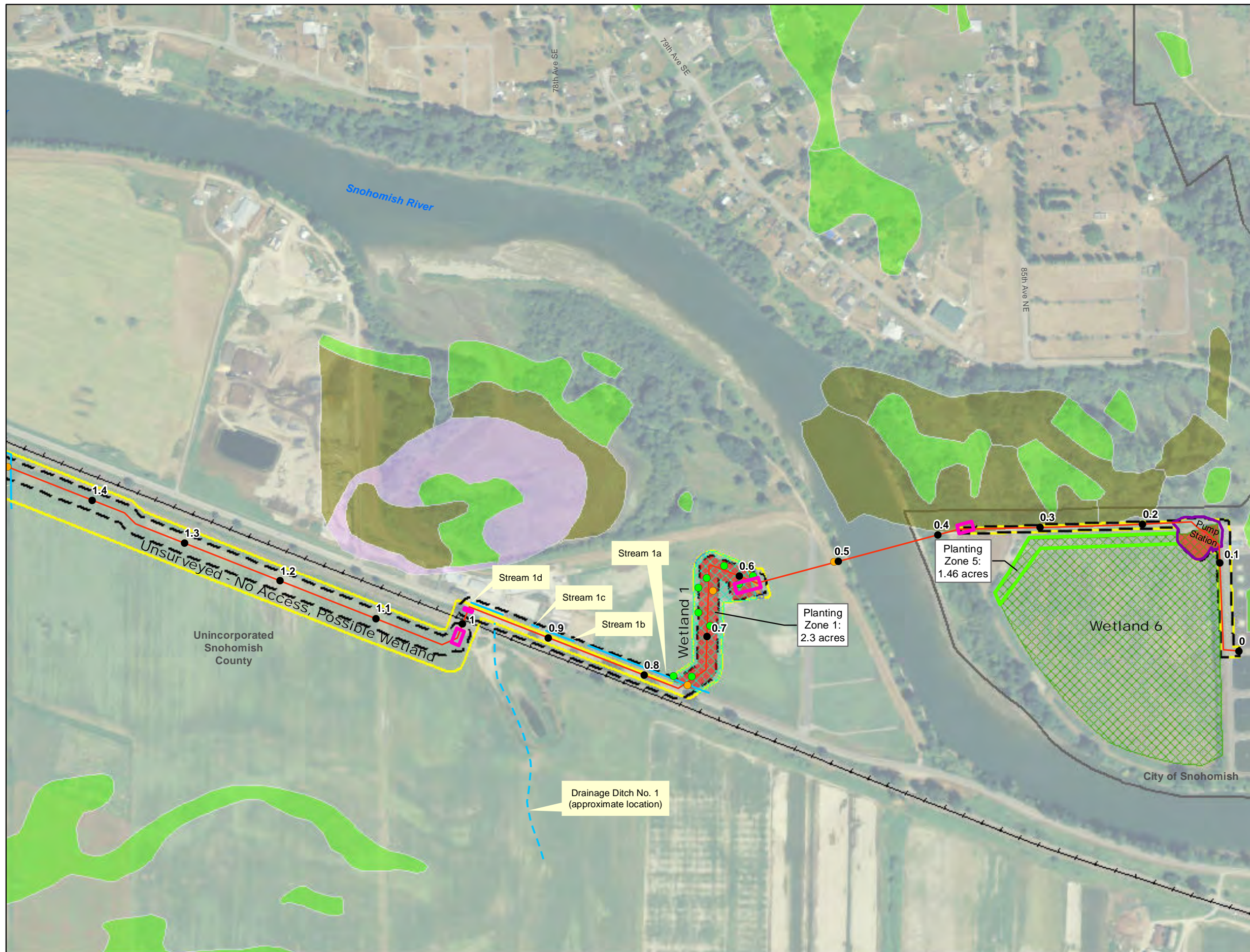
Temporary impacts on wetlands and wetland buffers are defined as those impacts from secondary construction features such as temporary access roads, temporary vegetation clearing, construction staging and stockpiling areas, and construction stormwater best management practices.

The temporary impacts expected to result from the proposed project include disturbance and some removal of the existing vegetation (planted crops, common rush, reed canarygrass, other wetland emergent plants within Wetland 5, and Himalayan blackberry shrubs) and temporary disturbance of the existing grade in the open trench and HDD entry and exit pit areas. The HDD entry and exit pits and railroad crossing jacking pits would be generally 40 feet wide by 80 feet long. This plan assumes that an additional 30 feet from each pit boundary would be needed for construction work. For example, where the proposed force main crosses the BNSF railroad next to Lowell-Snohomish River Road, the jacking pit would be limited to the existing roadway.

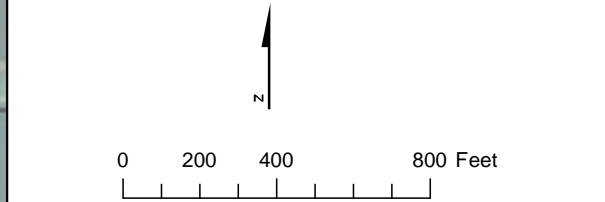
Temporary impacts to the buffer of Wetland 6, located just west of the WWTP, include removal of some willow, red alder, and Himalayan blackberry shrubs in order to construct the pump station.

There would also be temporary impacts to the Cemetery Creek wetland buffer to the northwest of the WWTP, which would include the removal of some willow, red alder, and Himalayan blackberry shrubs in order to construct the HDD entry pit.

Impacts to the buffers of Wetlands 2, 3, 4, and 5 include temporary disturbance of the dirt and gravel farming roads and removal of the Himalayan blackberry shrubs, planted crops or tilled soil that compose these buffer areas.

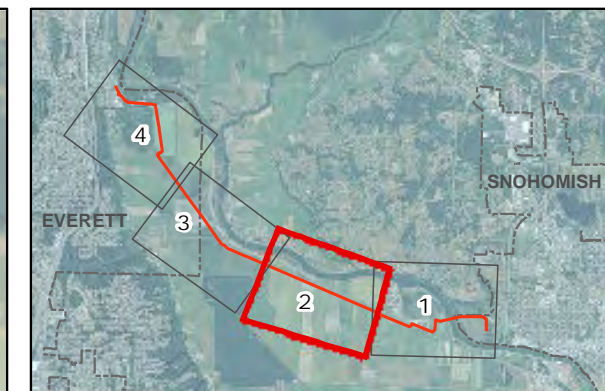


- Force Main Milepost
- Proposed Force Main
- Stream
- BNSF Railway
- Area of Potential Effect
- Pump Station
- HDD/Jack and Bore Pit Locations (Approximate)
- Impact Corridor
- Planting Zone
- Wetland Impact
- Wetland Buffer Impact
- No Access
- Snohomish County Wetland
- Wetland within APE**
- PEM
- PEM/PFO
- PEM/PSS
- Wetland Buffer Within APE
- Open Water
- NWI Wetland Type**
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- City Boundary

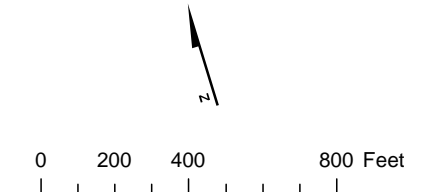


Source: Color Aerial; National Agriculture Imagery Program (NAIP), 2009.

FIGURE 2
Wetland Impacts / Planting Zones
Sheet # 1
 Everett Conveyance Project
 Snohomish County, WA

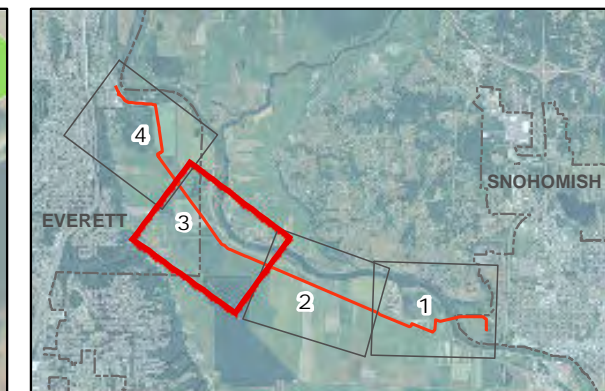
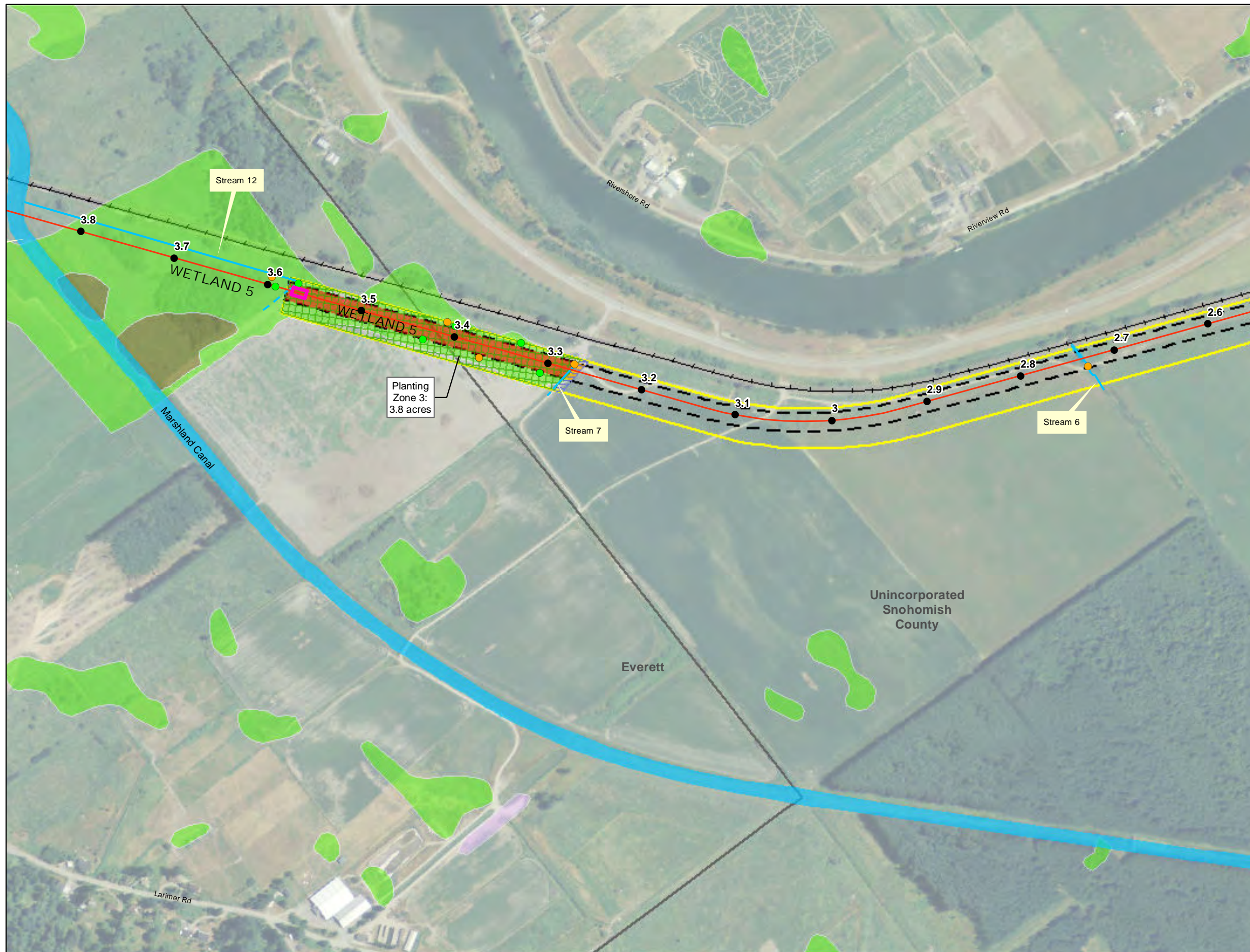


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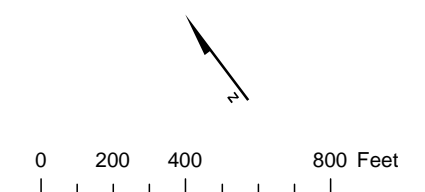


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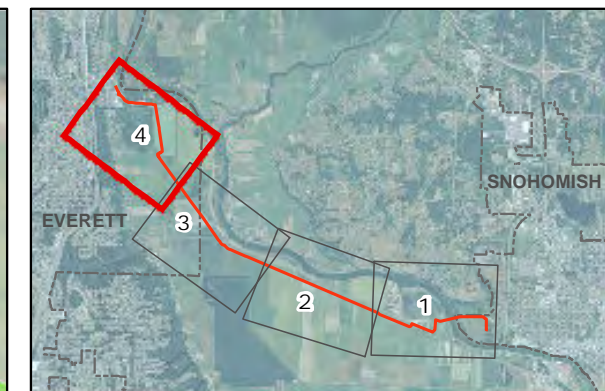


- Force Main Milepost
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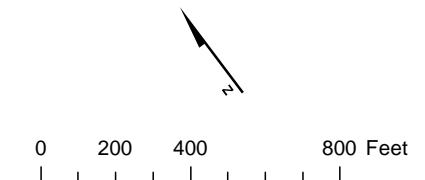


Source: Color Aerial; National Agriculture Imagery Program (NAIP), 2009.

FIGURE 2
Wetland Impacts / Planting Zones
Sheet # 3
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 Snohomish County, WA



- Force Main Milepost
- Proposed Force Main
- Stream
- BNSF Railway
- Area of Potential Effect
- Pump Station
- HDD/Jack and Bore Pit Locations (Approximate)
- Impact Corridor
- Planting Zone
- Wetland Impact
- Wetland Buffer Impact
- No Access
- Snohomish County Wetland
- Wetland within APE**
- PEM
- PEM/PFO
- PEM/PSS
- Wetland Buffer Within APE
- Open Water
- NWI Wetland Type**
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- City Boundary



Source: Color Aerial; National Agriculture Imagery Program (NAIP), 2009.

FIGURE 2
Wetland Impacts / Planting Zones
Sheet # 4
 Everett Conveyance Project
 Snohomish County, WA

As the design for the project continues to progress, modifications to the wetland impact locations and values reported here may occur. Additional geotechnical investigations are being planned that may result in an extension of the open trenching area and reduction of the HDD extent through Wetland 5, which would increase the temporary impacts expected to occur to Wetland 5. The appropriate regulatory agencies and jurisdictions will be notified if any of the impact values stated in this plan or in the project's permitting documents increase.

4.3 Significant Trees

The City of Snohomish and Snohomish County have specific regulations addressing impacts to significant trees. At this time, the project is not expected to remove any trees considered significant by either of these jurisdictions. The City of Everett does not have a regulation that defines significant trees.

The City of Snohomish defines significant trees as follows:

- Significant stand of trees means trees covering an area of at least 2,500 square feet, where the drip line of the trees covers half of the area, which according to an arborist is necessary for the trees to remain healthy and viable.
- Significant tree means a deciduous and evergreen tree 8 inches or greater in diameter measured at a point 4 feet above the ground, other than alders and cottonwoods (*Alnus rubra* and *Populus trichocarpa*).

A stand of mature cottonwoods and alders within the City of Snohomish at the WWTP would be permanently removed to construct the pump station. However, according to the City of Snohomish code definition listed above, these are not considered significant trees and do not require mitigation.

Snohomish County defines significant tree as one with a caliper (diameter at breast height) of at least 10 inches (*Snohomish County Planning and Development Services, Assistance Bulletin #76: Tree Replacement and Retention*). The County does not consider red alders (*Alnus rubra*) to be significant trees. Should refined construction plans indicate the potential to affect any significant trees in the City of Snohomish or unincorporated Snohomish County, the jurisdiction would be notified and any required mitigation would be determined at that time.

5. Wetland Protection and Mitigation

Wetland mitigation follows a prescribed order of steps taken to reduce the impacts of activities on wetlands. Mitigation sequencing involves:

- (1) Avoiding the impact altogether by not taking a certain action or parts of an action,
- (2) Minimizing the effects by limiting the degree of an action,
- (3) Rectifying the effects by repairing or enhancing the affected environment,
- (4) Reducing or eliminating the effects over time,
- (5) Compensating for the effects by replacing or substituting resources or environments, or
- (6) Monitoring the effects and taking appropriate corrective measures (Ecology et al. 2006).

The mitigation for the proposed project's unavoidable temporary impacts on wetlands involves steps 1, 2, and 3, as described below. Mitigation would involve avoiding significant trees, minimizing the amount of vegetation removal, restoring the existing grade using native material, and reestablishing vegetation to preserve the wetland functions and values.

5.1 Avoidance and Minimization

Construction activities would be limited to a corridor no more than 50 feet wide along the proposed sewer force main alignment, and 30 feet from the HDD and jack-and-bore pits. Additional construction staging and access areas would be limited to upland areas within the adjacent roadways and parking lots.

The project will avoid impacts to wetlands and trees in the City of Everett jurisdiction (adjacent to Lowell-Snohomish River Road) and the City of Snohomish jurisdiction (just north of the WWTP) by limiting construction to the existing roadways, roadway shoulder, and other uplands. High-visibility construction fencing and silt fencing should be installed along these wetland boundaries prior to construction.

The project's construction will avoid impacts to presumed wetland areas on the west side of the Marshland Canal, mature forested vegetation in Wetland 5, and riparian vegetation along the Snohomish River by utilizing HDD to install the force main pipeline. No other significant trees or significant areas of riparian vegetation are located close enough to the proposed construction corridor to require special consideration while working in their vicinity.

Excavated material not used in the trench restoration would be removed offsite to an approved location, and not disposed of within the wetlands.

5.2 Site Mitigation

The overall goal of site mitigation is to reestablish vegetation successfully to compensate for unavoidable permanent and temporary disturbance of the site from the proposed project. Mitigation for impacts would be in the form of restoration, creation, or enhancement as directed by City or County codes.

5.2.1 Grading

After placement of the new sewer force main pipeline in the trench, the trench, HDD, and jacking pits would be backfilled with the original material and the ground restored to its original grade. Any soil profile revealed during trench excavation would be preserved during backfilling.

The berm around the pump station would be replanted after fill placement, if required by the City and other permitting agencies, to compensate for the grade change and vegetation removed to allow for construction of the pump station.

5.2.2 Construction

For mitigation of impacts to Wetland 6 resulting from the construction (temporary) and operation (permanent) of the pump station, pump station foundation and associated piping, the applicant proposes the installation of wetland vegetation (such as willow trees) within the former sewage lagoon. These plantings would enhance the wetland and improve the habitat for wildlife use, aid in stormwater detention and treatment, and serve to screen the facility visually.

Mitigation would be per SMC 14.260.050, and would be consistent with the *Department of Ecology Guidance on Wetland Mitigation in Washington State, Part 2 (Ecology Publication #04-06-013B)*. City of Snohomish Code allows for mitigation in the form of restoration, creation, or enhancement. The sewage lagoon wetland area is about 30 acres, which would allow a sufficient amount of space for enhancement plantings. City code requires a mitigation ratio of 8:1 for enhancement. The area of permanent impact created by the proposed pump station is about 0.46 acres; therefore, about 3.68 acres of enhancement mitigation would be required. Plantings within the lagoon area would be completed in conjunction with the restoration work for the 20-inch PVC force main constructed in that area.

5.2.3 Planting Zones

Four planting zones have been identified and one has been proposed. These planting zones would be established for site restoration of vegetation within the wetlands and their buffers (Figure 2 – Sheets 1 - 4). In all Planting Zones, the seed mixes and wetland emergent plants should be installed immediately following construction. Temporary irrigation of restored areas will depend upon the terms of the construction easement with the landowner and the seasonal conditions at the time of planting. No temporary irrigation is assumed necessary for the wetland emergent plants in Planting Zones 3 and 4.

This plan assumes that construction will not result in the removal of any significant trees or areas dominated by native shrubs. Should significant tree or native shrub removal occur during construction, the landowner and jurisdiction should be notified to determine any appropriate mitigation.

A recommended seed mix for Planting Zones 3 and 4 is provided in Appendix A. This seed mix is a modified version of the “Native Wetlands Mix” available from Sunmark Seeds International, located in Portland, OR. The modifications provide a restoration seed mix that more closely resembles the existing plant community. Sunmark Seeds can provide specialized seed mixes based on actual site conditions upon request.

Each of the Planting Zones described below may be actively farmed before and after construction. As such, the recommended seed mixes in this plan are subject to landowner approval, and final restoration plans will depend upon the types of plants present during construction and the terms of the construction easements with the landowners.

A general planting plan is illustrated in Figure 2, Sheets 1-4.

Planting Zone 1

Planting Zone 1 would likely be re-seeded with a grass seed mix appropriate for restoring the existing grass field (most likely red fescue grass seed), subject to landowner approval.

Planting Zone 2

Planting Zone 2 would be re-vegetated according to the terms of the construction easement with the landowner (cropland and dirt/gravel access roads that cover the regulatory buffer).

Planting Zone 3

Planting Zone 3 is located within a large area of relatively undisturbed (not actively farmed as of the writing of this plan) emergent wetland plants dominated by common rush, reed canarygrass, and other wetland emergent grasses. Planting Zone 3 should be re-vegetated with the seed mix recommended in Appendix A, or an equivalent native wetland (obligate) emergent seed mix.

Planting Zone 4

Planting Zone 4 is located within a presumed emergent wetland area that has not been field-surveyed as of the writing of this plan, due to lack of access. The wetland seed mix provided in Appendix A may be appropriate should the plant community be similar to that observed in Planting Zone 3 (dominated by common rush, reed canarygrass, and other wetland emergent grasses).

Planting Zone 5

A separate planting zone would be created for mitigation work within Wetland 6 once the type of mitigation; enhancement, restoration or creation, is agreed to by the permittee and the agencies. Figure 2, Sheet 1, illustrates the proposed area where Planting Zone 5 would be located.

6. Site Management

A standard 1-year planting warranty will be expected of the landscape contractor who installs the plants according to the site mitigation instructions, which are described above or will be provided by the landowners via the terms of the construction easement.

Within a month of completing construction and planting (or initial acceptance), as-built plans should be sent to each jurisdiction (the City of Snohomish, Snohomish County, and the City of Everett), including an as-built topographic survey, plant species and quantities used, photographs of the site, and notes about any changes to the original approved plan.

If inspection by the City of Snohomish, Snohomish County, the City of Everett, or representatives of the permitting agencies indicates improper grading and/or insufficient cover or survival of woody or herbaceous vegetation, the City of Snohomish will propose adaptive management actions to correct shortcomings, such as plant replacement and weed control. The permitting agencies may also direct management activities, following consultation with the City of Snohomish, if the permitting agencies identify the need for corrective action and no adaptive management plan is submitted by the City of Snohomish within a reasonable period.

The enhancement mitigation proposed within Wetland 6 would be subject to a 5-year monitoring plan to ensure an 80 percent survival rate of plantings.

7. References

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APPENDIX A

Plant Material List

TABLE A-1
Planting Material List

Common name	Scientific name	Minimum percent by weight	Seed rate (lbs/acre)	# PLS/Ac	% cover desired
Common rush	<i>Juncus effusus</i>	30	50	15.0	20
Hardstem bulrush	<i>Scirpus microcarpus</i>	25	50	12.5	10
Water foxtail	<i>Alopecurus geniculatus</i>	15	50	7.5	20
Creeping spikerush	<i>Eleocharis palustris</i>	10	50	5.0	10
American sloughgrass	<i>Beckmannia syziganche</i>	10	50	5.0	10
Tufted hairgrass	<i>Deschampsia caespitosa</i>	7.5	50	3.8	10
Spike bentgrass	<i>Agrostis exarata</i>	0.5	50	0.3	20
Weed seed		0.5 (Max.)			
Inert and other crop		1.5 (Max.)			
		100			100

Notes: This seed mix is available as a modified version of the "Native Wetlands Mix" produced by SunMark Seeds International, located in Portland, OR.

Seed mix assumes all seed sown in wetland/river buffer and is therefore dominated by grass species native to western Washington. Seed rate in Pure Live Seed (PLS) pounds of mix per acre; #PLS/Ac = pounds of a species per acre based on percentages within mix. No noxious weed seed shall be allowed in seed mix.

