NEWCASTLE CRITICAL AREAS REPORT

Puget Sound Energy – Energize Eastside Project

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PUGET SOUND ENERGY – ENERGIZE EASTSIDE

1 EXECUTIVE SUMMARY

PSE's Energize Eastside Project (the Project) proposes to upgrade existing transmission lines in the city of Newcastle in order to increase transmission system capacity to 230kV power. The Project is needed to address electrical system deficiencies identified during federally-required planning studies and to improve electrical supply and reliability to Eastside communities, including Newcastle, now and in the future.

Regulated critical areas are present in the Project area and include wetlands, streams (also designated as Fish and Wildlife Habitat Conservation Areas), geologic hazard areas, and associated buffers.

The Project was designed to avoid and minimize impacts to critical areas. No direct impacts (*i.e.*, new poles) are proposed in wetlands, streams, landslide hazard areas, or steep slope hazard areas. Limited impacts are proposed in erosion hazard areas, geologic hazard area buffers, and wetland and stream buffers.

In wetland and stream buffers, permanent impacts (*i.e.*, poles) will be *reduced* by 10 square feet compared to existing conditions; 21 trees will be removed resulting in 2,859 square feet of vegetation community conversion impacts; and 3,981 square feet of temporary disturbance will occur. Impacts were minimized by utilizing the existing transmission line corridor, limiting disturbance and implementing best management practices (BMPs) when working in critical areas, and installing transmission lines between poles with minimal site disturbance.

The majority of wetland/stream critical area impacts, which are exclusively buffer impacts, occur in the May Creek buffer. Project impacts to wetland and stream buffers largely result from vegetation management (*i.e.*, tree removal). Impacts will be mitigated on an areal and functional basis in the May Creek buffer pursuant to, the Final Mitigation Plan. Impacts to geologic hazard areas have been quantitatively assessed and proposed activities have been determined

to not significantly affect geologic hazard areas or their associated buffers with implementation of BMPs.

This report is intended to support the City of Newcastle's critical area review process and satisfy the requirements of the Newcastle Municipal Code (NMC), Chapter 18.24 – Critical Areas.

2 Introduction and Project Description

Puget Sound Energy, Inc. ("PSE") proposes the construction of a new 230 kV to 115 kV substation (Richards Creek Substation in Bellevue) and to upgrade approximately 18 miles of existing 115 kV transmission lines located within an approximately 100-foot wide regional utility corridor to accommodate 230 kV power (collectively "the Project"). The Richards Creek Substation will be built to accommodate the 230kV to 115kV transformer needed to accommodate the transmission line upgrade, which is necessary to address a deficiency in electrical transmission capacity during peak periods. Combined with aggressive conservation, the Project will improve reliability for Eastside communities, including the City of Newcastle ("Newcastle" or "City"), and supply the needed electrical capacity for anticipated growth and development on the Eastside.

Within Newcastle, the Project corridor extends north-south for approximately 1.5 miles (Figure 1). The proposal includes the removal of 22 H-frame and 2 triple-pole structures (consisting of 50 poles). PSE then plans to install 24 monopoles.

The existing transmission lines are located in PSE's Sammamish-Lakeside-Talbot transmission line corridor, which was established in the late 1920s and early 1930s. Within the existing utility corridor, the proposed upgraded lines will place poles in generally the same locations as existing poles. In some instances, poles will be moved to accommodate landowner preferences and easement considerations, and to minimize impacts to critical areas. During construction, selective tree removal will occur within the corridor to meet federal vegetation management requirements and PSE standards.

The purpose of this Critical Areas Report is to document critical area impacts that are expected to occur as a result of the PSE Energize Eastside Project in Newcastle.

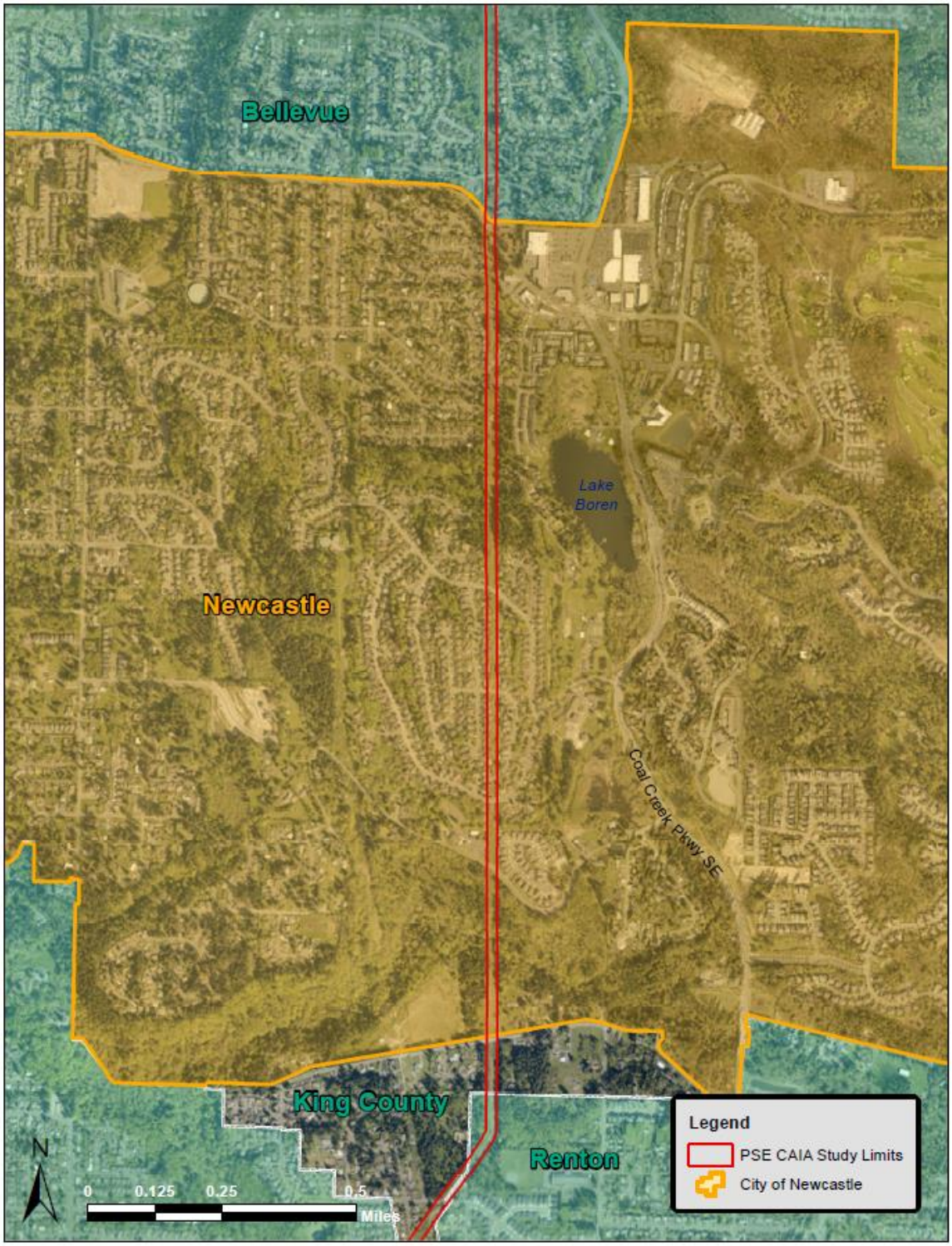

Figure 1. Map of Energize Eastside Project route in Newcastle and limits of the Critical Area Impact Assessment (CAIA).

3 METHODS

A Critical Areas Impact Assessment ("CAIA") was conducted for the Energize Eastside Project in Newcastle. The analysis combined GIS-based assessment with field-verified conditions and evaluated proposed project elements in relation to existing land cover types and regulated critical areas. The location and type of each proposed activity was used to determine impacts and mitigation needs and is based upon preliminary site plans provided by PSE (on 6/30/17 with updates through 10/10/17). A detailed description of the CAIA process and methods is provided in Appendix D.

3.1 Study Area

For the purposes of this report the study area is limited to a segment of the proposed Energize Eastside corridor within Newcastle. The Newcastle corridor runs from Newcastle Way south to SE 95th Way, a distance of approximately 1.5 miles. The study area in the city of Newcastle is limited to the area within the boundaries of an approximately 100-foot wide regional utility corridor (Figure 1). The study area is depicted in the attached maps (Appendix A).

3.2 Data Compilation

Critical areas evaluated as a part of the analysis include wetlands, streams, habitats for species of local importance, geologic hazard areas, areas of special flood hazard, shorelines, and any associated critical area buffers. To facilitate the CAIA, the following data were compiled and reviewed: vegetation inventory, wetland and stream surveys, and publically available data.

Vegetation Inventory

Existing vegetation with the potential to reach a height greater than 15 feet located in the Project area corridor was inventoried between March and November 2015. Vegetation inventory methodology and results are available in the *City of Newcastle Tree Inventory Report: Puget Sound Energy – Energize Eastside Project* (The Watershed Company 2016b). Tree data used in this CAIA were obtained and compiled from survey, GPS, and digitization using high-resolution imagery.

Wetland and Stream Surveys

Wetlands and streams were delineated and classified between March and October 2015. They are documented in the *City of Newcastle Critical Areas Delineation Report: Puget Sound Energy – Energize Eastside Project* (The Watershed Company 2016a). Wetland and stream data were compiled from GPS data and are limited to the study area at the time of the original inventory which generally consisted of a 100-foot wide corridor defined by an established PSE easement.

Delineation study methodology is detailed in the previously-referenced delineation report (The Watershed Company 2016a).

Wetland and stream classifications were updated in April 2017 based upon Newcastle's updated critical areas ordinance. The findings of the re-classification study are presented in a letter-style report (Appendix B) and have been incorporated into the body this document where appropriate.

Publicly Available Data

Publicly available King County GIS Center data were utilized for mapping the following critical areas in Newcastle: coal mine hazard areas, erosion hazard areas, flood hazard areas, and landslide hazard areas. Steeps slope hazard areas were mapped using high-resolution LIDAR. The steep slope mapping process is described in detail in Appendix D.

No flood hazard areas or coal mine hazard areas are located within the Project limits in Newcastle. Geologic hazard area data reviewed as part of this CAIA are steep slopes, landslide hazard areas, and erosion hazard areas only. Data used to map impervious surfaces and development include the King County Impervious and Impacted Surface data (King County 2009), supplemented with land survey data and high-resolution aerial photography provided by PSE.

3.3 Project Element Construction – Potential Impacts

Project elements that have the *potential* to impact critical areas are defined in this section and include the following:

- Pole replacement:
  - removal of old poles
  - installation of new poles
    - pole buffer (6-foot radius outside of pole footprint),
    - pole construction work area (varies by pole type, see description below);
- Access routes (approximately 20 feet wide);
- Stringing sites; and
- Vegetation management requirements.

3.3.1 Pole Replacement

Existing H-frames (consisting of 2 or 3 poles) will be replaced with new monopoles (*i.e.*, a single pole). Existing pole sizes have been presumed to be approximately 2.75 feet in diameter on average. In general, relocation activities will occur in close proximity to the existing H-frames, but some of the replacement poles will be moved to accommodate landowner preferences, due to easement considerations, and to minimize impacts to critical areas. To conduct this work, PSE created construction scenarios specific to the type of structure

being installed. Table 1 below describes the scenarios applicable to the Project. These scenarios provide assumptions used to assess impacts.

Table 1. PSE construction scenarios.

Description	Scenario	
No Critical or Recreation Area Present		
Direct embed-single pole • Temporary work area is generally 2,500 square feet • Create hole (hole will be larger than diameter of the new pole) • New pole and backfill delivered to site • Place pole in hole and backfill annulus • Stabilize site	A	A1
Foundation-single pole • Temporary work area is generally 5,000 square feet • Create hole (hole will be slightly larger to accommodate foundation installation) • New pole and foundation materials delivered to site • Build foundation and install pole • Stabilize site	C	C1
Critical or Recreation Area Present		
Direct embed-single pole • Establish construction buffer from critical area using appropriate Best Management Practices (BMPs) • Temporary work area is generally 2,500 square feet • Create hole (hole will be larger than diameter of the new pole) • New pole and backfill delivered to site • Place pole in hole and backfill annulus • Stabilize site	A	A2
Foundation-single pole • Establish construction buffer from critical area using appropriate BMPs • Temporary work area is generally 5,000 square feet • Create hole (hole will be slightly larger to accommodate foundation installation) • New pole and foundation materials delivered to site • Build foundation and install pole • Stabilize site	C	C2

While the work area for each pole type is defined as a consistent size to be conservative, the shape of the disturbed area will vary depending on the presence of critical areas or other sensitive features in the Project corridor. During construction, these areas will be excluded from the disturbance area. Pole

replacement will potentially result in three types of impacts: permanent, vegetation conversion, and temporary.

- Permanent impacts will be associated with the installation of new poles, which will have a base diameter ranging from 3 feet to 6 feet depending on the pole type (direct imbed or new foundation). However, some existing poles (which currently contribute to permanent fill) will be removed from the critical areas and this was taken into account.

- Vegetation conversion impacts will be associated with the removal of incompatible transmission line vegetation in the pole construction work area and pole buffer (6 feet from pole). After construction, the pole construction work areas will be re-vegetated and left to return to their natural state or enhanced (using transmission line appropriate vegetation). The transmission line corridor, and associated area surrounding the poles, will experience routine vegetation management. All vegetation in the wire zone and managed ROW portions of the transmission line corridor, when mature, will be fifteen feet or less (unless the topography allows for at least a 20-foot clearance between vegetation and the lines). During typical inspections and maintenance of the poles, vegetation is routinely disturbed; as such, no trees of any size will grow within close proximity (6 feet) of the new poles.

- Where pole construction work areas and pole buffer areas do not require the removal of trees, the resulting impacts will be temporary. The majority of pole construction work area and pole buffer impacts are expected to be temporary due to the existing use and management of the corridor (*i.e.,* lack of trees) and consideration that existing groundcover will be restored or regenerate on its own within one growing season. After construction, the temporarily disturbed areas will be re-vegetated and left to return their natural state or enhanced.

BMPs will be used to minimize impacts resulting from pole replacement activities. In critical areas or buffers, mats will be placed over existing vegetation where possible. Typically, crushed vegetation rebounds within one growing season resulting in only temporary impacts to vegetation. Post construction, all disturbed areas will be re-vegetated, if necessary, and left to return to their natural state.

The impacts are further analyzed and quantified in Section 7 of this report.

3.3.2 Access routes

Access to poles in critical areas located in the transmission corridor will generally occur using existing, partially vegetated access (established during original

construction and re-used over time to maintain the corridor). BMPs will be used to minimize ground disturbance in these areas, and in new areas of access. In critical areas or buffers, mats will be placed over existing vegetation where possible. Typically, crushed vegetation rebounds within one growing season resulting in only temporary impacts to vegetation. Where access route alignment requires tree removal, impacts will be characterized as conversion. Post construction, all disturbed areas will be re-vegetated, if necessary, and left to return to their natural state in compliance with vegetation management requirements. Based on the existing conditions, proposed construction BMPs, and post-construction methods, disturbance associated with access in the transmission corridor will predominantly be temporary.

3.3.3 Stringing Sites

In order to replace the transmission conductor, stringing and tensioning equipment will be staged near new steel poles at specific locations along the corridor in preparation for the stringing of new wire. The disturbance area associated with the equipment and materials to restring the conductor wire will be isolated from wetlands and streams to the extent feasible. In critical areas and buffers, mats will be placed over existing vegetation where possible to allow access to poles for stringing activities. Typically crushed vegetation rebounds within one growing season resulting in only temporary impacts to vegetation. Tree removal activities necessary for the stringing of new wire (in the wire zone) will be performed in a manner to minimize impacts to underlying shrubs, groundcover and other trees, without disturbance to soil. The various techniques utilized to string the wire will not result in surface disturbance (*i.e.,* shooting the wire past obstacles, pulling it along established guide wire, etc.).

For this analysis, stringing sites have been identified as point locations and not polygons (Appendix A). However, each stringing site will be approximately 7,500 square feet of disturbance. Similar to pole construction work areas, the shape of the stringing site will depend upon the presence of adjacent critical areas, existing land conditions, and area needed for equipment staging based on the necessary angle needed to string the conductor. In many areas, this disturbance will overlap with various impacts quantified for proposed access, pole installation, and vegetation management. While impacts have not been quantified for stringing sites, stringing sites are expected to largely overlap other work areas and are not expected to require additional tree removal. Any additional impacts resulting from stringing sites, not already quantified in Section 7 through other Project elements, will be temporary in nature; temporary impact areas will be re-vegetated and left to return their natural state or enhanced following construction.

3.3.4 Vegetation Management

Vegetation in the existing corridor is routinely managed. The corridor was initially disturbed during original construction (including soil compaction associated with construction activities for the line itself and roads, parking lots, subdivisions, trails, and commercial development). Disturbance is regular and ongoing due to maintenance and pole replacement activities. With the exception of May Creek Park, the majority of trees in the existing corridor are ornamental and associated with existing property uses.

Vegetation in a transmission line corridor that has an operational voltage of more than 200 kV must be managed in compliance with federal requirements. Vegetation management standards vary depending upon the location of vegetation management in relation to transmission wires. These specific locations are defined as follows:

- Wire Zone – Section of a utility transmission ROW extending to 10 feet from the outside transmission wire(s). Vegetation with a mature height of 15 feet or less is allowed in this zone.

- Managed ROW – The section of a transmission line ROW that extends 6 feet outside of the wire zone. Vegetation with a mature height of 15 feet or less is allowed in this zone.

- Legal ROW – The full width of the easement. While vegetation maintenance is permitted within the full extent of the legal ROW, based on communication with PSE, only a portion of the legal ROW is intended to be maintained; this area is described as the maintained legal ROW and generally extends 10 feet from the edge of the managed ROW. Maximum height of mature vegetation between the managed ROW and legal ROW is dependent upon tree species, tree health, and distance from the wires.

Consistent with federal standards, vegetation in the wire zone must have a mature height of no greater than 15 feet, unless the topographic change is sufficient to allow a 20-foot vertical clearance between the power lines and the mature height of trees under the power lines. The same vegetation requirement was applied to the managed ROW zone. The legal ROW is composed of existing and proposed easements; its width is approximately 100 feet through Newcastle. The area outside of the managed ROW, but still within the legal ROW, is also subject to select clearing of trees that pose a risk of damaging the lines. To facilitate the CAIA, in the maintained legal ROW, a maximum mature tree height of 70 feet was presumed. However, existing trees greater than 70 feet, or with a mature height of greater than 70 feet will not necessarily be removed. Impacts resulting from required vegetation management are characterized as conversion in Section 7 of this report.

For critical areas located within the transmission corridor, these vegetation management requirements will affect residential vegetation (predominantly back yard ornamentals). PSE will be working with individual property owners to replace their vegetation with transmission line compatible species or tree replacement outside the corridor. In these areas, the function of the critical area will not change (maintained, back yard vegetation).

3.4 Critical Areas Impact Analysis

The CAIA was conducted by placing tree points/polygons and critical area polygons on a georeferenced base map and overlaying preliminary site plans to determine impacts. Impervious surfaces and other similar areas characterized as developed were removed from wetland and stream buffer areas for this CAIA as non-functioning buffer areas. The resulting functioning wetland and stream buffers are shown in Appendix A.

Where Project elements (as discussed in Section 3.3) are located in critical areas or their functioning buffers, impacts are quantified based on area (square footage [SF] of impact). Impact results were generated based upon the expected long-term condition of the area compared to the existing condition and include permanent impacts, impacts that result in vegetation conversion, temporary impacts, and activities that result in no change or no impact (see Section 7). For more detailed methodology on the CAIA, refer to Appendix D.

3.5 Limitations

The Watershed Company's technical expertise is specific to wetlands, streams, habitats for species of local importance, and shorelines. The geotechnical assessments and interpretation of impacts within geologic hazard areas, including landslide hazards and steep slopes have been addressed by others and referenced in the report and incorporated as an appendix (Appendix C).

This document represents a point-in-time analysis of the proposed Project, potential impacts, and approach to critical area mitigation. Refinements made as a result of ongoing design are expected to decrease Project impacts moving forward. If design changes result in increased permanent or conversion impacts that cannot be addressed in the proposed preliminary mitigation plan, a Critical Areas Report Addendum will be prepared to address those impacts.

4 Existing Conditions

4.1 Site Location

The Newcastle study area is dominated by residential areas and May Creek Park, which are generally zoned Residential (R-6) and Limited Open Space (LOS), respectively. At the north end, the corridor passes through the Donegal and Olympus neighborhoods before crossing May Creek Park situated at the south end of the city. The study area is located in the May Creek drainage basin of the Cedar-Sammamish Watershed (WRIA 8) in Township 24N, Range 05E, Sections 28 and 33.

4.2 Site Description

When the corridor was constructed in the late 1920s and early 1930s, the entire corridor was cleared; construction activities resulted in a compacted subsurface in those areas where the poles were installed. Since that time, the corridor has been continually maintained by PSE through easement rights; using existing access routes/paths, poles have been replaced and vegetation has been managed. To do so, vehicles and equipment (such as cranes) have been used in the corridor. Over time, development has occurred adjacent to and within the corridor, including residential development, roads, parking lots, commercial development, and the establishment of trails (using overgrown access routes).

Olympic Pipeline Company (OPL) also utilizes the Project corridor in Newcastle for operation and maintenance of petroleum pipelines. In general, vegetation management requirements of pipelines is more restrictive than the previously-described vegetation management requirements for the transmission line. For example, trees and shrubs are expected to be mowed or removed on a more regular basis than for the transmission lines to prevent damage to the pipeline by large roots. In addition, a corridor of herbaceous vegetation may be maintained both to keep the area free of large tree and shrub roots and to be able to easily, visually inspect the pipeline corridor from the ground and/or air. The pipeline easement spans the length of the Project transmission line easement in Newcastle and acts as a regular, contributing source of ongoing disturbance to the shared corridor.

In residential areas, vegetation in the corridor is generally limited to landscaped beds and maintained yards. On parcels that have not been further developed to commercial or residential property and remain the managed utility corridor, vegetation is often weedy and dominated by Himalayan blackberry and various grasses; young trees and shrubs are present in some locations where they have presumably grown from seed. In May Creek Park, some vegetation has been

cleared for access and maintenance purposes in the corridor, but young forested patches are still present immediately adjacent to May Creek.

4.3 Critical Areas

This section defines Newcastle-regulated critical areas per Chapters 18.24 (Critical Areas) and 18.06 (technical terms and land use definitions) of the Newcastle Municipal Code (NMC) and describes the general location(s) of each critical area type in the proposed Energize Eastside corridor. Regulated critical areas include wetlands, streams, fish and wildlife habitat conservation areas, coal mine hazard areas, erosion hazard areas, flood hazard areas, landslide hazard areas, seismic hazard areas, and steep slope hazard areas. The Project area in Newcastle does not contain coal mine hazard areas, seismic hazard areas, or flood hazard areas. Furthermore, no jurisdictional shorelines are present in the Newcastle study area.

4.3.1 Wetlands

Newcastle defines wetlands as follows (NMC 18.06.710):

> *"Wetland" means an area that is not an aquatic area and that is inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and under normal circumstances supports, a prevalence of vegetation typically adapted for life in saturated soil conditions. For purposes of this definition:*
>
> *A. Where the vegetation has been removed or substantially altered, "wetland" is determined by the presence or evidence of hydric soil, by other documentation such as aerial photographs of the previous existence of wetland vegetation or by any other manner authorized in the wetland delineation manual required by RCW 36.70A.175; and*
>
> *B. Except for artificial features intentionally made for the purpose of mitigation, "wetland" does not include an artificial feature made from a nonwetland area, which may include, but is not limited to:*
>
> > *1. A surface water conveyance for drainage or irrigation;*
> >
> > *2. A grass-lined swale;*
> >
> > *3. A canal;*
> >
> > *4. A flow control facility;*
> >
> > *5. A wastewater treatment facility;*
> >
> > *6. A farm pond;*
> >
> > *7. A wetpond;*
> >
> > *8. Landscape amenities;*
> >
> > *9. A wetland created after July 1, 1990, that was unintentionally made as a result of construction of a road, street or highway.*

A total of two wetlands are located along the proposed Energize Eastside corridor in Newcastle. Wetland MN01 is a small wetland (542 SF) located northwest of Lake Boren. Wetland MN02 is also a relatively small wetland (456 SF) located north of SE 95th Way.

Wetlands will not be directly impacted as a result of the Project (Section 7).

4.3.2 Streams

Newcastle defines streams as follows (NMC 18.06.633):

> *Those areas in the city of Newcastle where surface waters produce a defined channel or bed, not including irrigation ditches, canals, storm or surface water run-off devices or other entirely artificial watercourses, unless they are used by fish or are used to convey streams naturally occurring prior to construction in such watercourses. For the purpose of this definition, a defined channel or bed is an area which demonstrates clear evidence of the passage of water and includes, but is not limited to, bedrock channels, gravel beds, sand and silt beds and defined-channel swales. The channel or bed need not contain water year-round provided there is evidence of at least intermittent flow during years of normal rainfall.*

A total of three streams are located along the proposed Energize Eastside corridor in Newcastle. Stream MB01 is mostly located in Bellevue, but extends into the northern portion of Newcastle. Stream MN01 is adjacent to Wetland MN01, northwest of Lake Boren. Stream MN02, or May Creek, is located between SE May Creek Park Drive and SE 95th Way at the south end of the study area. Where the Project area crosses May Creek, the mean annual flow based on Ecology data is less than twenty cubic feet per second; May Creek is not considered a shoreline of the state at this location.

Streams will not be directly impacted as a result of the Project (Section 7).

4.3.3 Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas are designated as follows (NMC 18.24.302):

> *Fish and wildlife habitat conservation areas are those areas essential for the preservation of critical habitats and species. All areas within the city of Newcastle meeting one or more of the following criteria are designated fish and wildlife habitat conservation areas:*
>
> *1. Areas with Which State or Federally Designated Endangered, Threatened, and Sensitive Species Have a Primary Association.*
>
> > *a. Federally designated endangered and threatened species are those fish and wildlife species identified by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service that are in danger of extinction or threatened to become endangered. The U.S. Fish and*

Wildlife Service and the National Marine Fisheries Service should be consulted for current listing status.

b. State designated endangered, threatened, and sensitive species are those fish and wildlife species native to the state of Washington identified by the Washington Department of Fish and Wildlife, that are in danger of extinction, threatened to become endangered, vulnerable, or declining and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats. State designated endangered, threatened, and sensitive species are periodically recorded in WAC 232-12-014 (state endangered species) and 232-12-011 (state threatened and sensitive species). The State Department of Fish and Wildlife maintains the most current listing and should be consulted for current listing status.

2. State Priority Habitats and Areas Associated with State Priority Species. Priority habitats and species are considered to be priorities for conservation and management. Priority species require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority habitats are those habitat types or elements with unique or significant value to a diverse assemblage of species. A priority habitat may consist of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element. Priority habitat and species are identified by the State Department of Fish and Wildlife.

3. State-Designated Priority Habitat or Critical Habitat for State-Designated Species. The Washington Department of Fish and Wildlife should be consulted for the current lists of priority habitats and species.

4. Habitats and Species of Local Importance. Habitats and species of local importance are those identified by the city, including but not limited to those habitats and species that, due to their population status or sensitivity to habitat manipulation, warrant protection.

5. Naturally Occurring Ponds under 20 Acres. Naturally occurring ponds are those ponds under 20 acres and their submerged aquatic beds that provide fish and wildlife habitat, including those artificial ponds intentionally created from dry areas in order to mitigate impacts to ponds. Naturally occurring ponds do not include ponds deliberately designed and created from dry sites, such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds, and landscape amenities, unless such artificial ponds were intentionally created for mitigation.

6. Waters of the State. Waters of the state include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington, as classified in WAC 222-16-031.

7. Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity.

8. Land useful or essential for preserving connections between habitat blocks and open spaces.

Available Habitat

The Project area is located in an urban and developed landscape. While the power line corridor is vegetated, vegetation predominantly consists of low-growing grasses, landscape plants and invasive plant species (Himalayan blackberry and reed canarygrass) typical of maintained corridor areas that generally offer little in terms of habitat value when compared to other natural urban parks and greenspaces which are expected to provide more vegetative cover, structure, and diversity, and fewer invasive plant species. Two forested patches are present in or near the Project area that are considered to have an increased potential for wildlife use (when compared to other Project areas in Newcastle); these include a forested patch west of Lake Boren and the forested areas of May Creek Park. Even at these locations, existing maintenance activities associated with the corridor, established PSE and OPL programs and procedures, and the urban landscape setting reduce the likelihood that regulated species will utilize power line corridor areas for breeding.

WDFW's online mapping program, PHS on the Web, was reviewed for known priority habitats in the Project area; none are mapped. This is consistent with field observations. Newcastle does not currently maintain or regulate a list of habitats of local importance.

Federally-listed Species

Endangered Species Act (ESA) documentation for the south segment of the Project, which includes the South Bellevue Segment, Newcastle, and Renton, addresses federally-listed species. As summarized in that document, the proposed Project will have no effect on ESA-listed species based upon lack of documented use, lack of suitable habitat, and/or avoidance of in-water work.

State-listed Species

State-listed species, that are not also listed as federally threatened or endangered (*i.e.*, covered in the ESA document) are provided in Table 2. Table 2 does not include state candidate species. Of the species listed in Table 2, none are expected to occur in the Project area; use of the corridor is precluded by absence of suitable habitat and/or the species' known distribution and range in Washington State.

Table 2. State-listed wildlife species, excluding those listed as federally endangered and threatened.

Wildlife Type	Common Name	Scientific Name	Listing Status[1]	
			State	Federal
Mammals	**fisher**	*Martes pennanti*	SE	FSC
	- Habitat/Distribution: Historic range includes western Washington lowlands. Current range is fragmented in Washington and more extensive in Canada. Preferred habitat is closed-canopy forests. - Determination: Habitat and known distribution not present in Project area.			
	gray whale	*Eschrichtius robustus*	SS	--
	- Habitat/Distribution: Marine. - Determination: Habitat not present in Project area.			
	Mazama pocket gopher	*Thomomys mazama*	ST	FSC[2]
	- Habitat/Distribution: Distribution limited to prairie habitats in Pierce and Thurston Counties. - Determination: Distribution does not overlap Project area.			
	sea otter	*Enhydra lutris*	SE	FSC
	- Habitat/Distribution: Marine. - Determination: Habitat not present in Project area.			
Birds	**American white pelican**	*Pelecanus erythrorhynchos*	ST	--
	- Habitat/Distribution: Breeding and non-breeding range is limited to central and eastern Washington. - Determination: Distribution does not overlap Project area.			
	common loon	*Gavia immer*	SS	--
	- Habitat/Distribution: Known to breed on secluded lakes in King County. Commonly over winters in protected marine waters of Puget Sound. - Determination: Habitat not present in Project area.			
	ferruginous hawk	*Buteo regalis*	ST	--
	- Habitat/Distribution: Steppe or shrub-steppe habitat of eastern Washington Counties. - Determination: Habitat and distribution does not overlap Project area.			
	greater sage-grouse	*Centrocercus urophasianus*	ST	FSC
	- Habitat/Distribution: Shrub-steppe habitats of central and eastern Washington. - Determination: Habitat and distribution does not overlap Project area.			
	sandhill crane	*Grus canadensis*	SE	--
	- Habitat/Distribution: No historic or current breeding sites in King County. - Determination: Distribution does not overlap Project area.			

Wildlife Type	Common Name	Scientific Name	Listing Status[1] State	Listing Status[1] Federal
	Columbian sharp-tailed grouse	*Tympanuchus phasianellus*	ST	--
	- Habitat/Distribution: Historical range is non-forested areas east of Cascades; current range is much smaller and fragmented in eastern Washington. - Determination: Distribution does not overlap Project area.			
	tufted puffin	*Fratercula cirrhata*	SE	--
	- Habitat/Distribution: Coastal waters of Washington. - Determination: Distribution does not overlap Project area.			
	upland sandpiper	*Bartramia longicauda*	SE	--
	- Habitat/Distribution: Scattered historical breeding records for eastern Washington; may now be extirpated. - Determination: Distribution does not overlap Project area.			
Reptiles and Amphibians	**Western pond turtle**	*Actinemys marmorata*	SE	--
	- Habitat/Distribution: Historical distribution likely included western King County; however, no current populations are known in this area. Important aquatic habitat features include underwater refugia, still/slow water, and basking structures. - Determination: Habitat not present in Project area.			
	Larch Mountain salamander	*Plethodon larselli*	SS	--
	- Habitat/Distribution: Populations generally limited to southern Washington counties near the Columbia River Gorge. - Determination: Distribution does not overlap Project area.			
	Northern leopard frog	*Lithobates pipiens*	SE	--
	- Habitat/Distribution: Current and historic distribution limited to eastern Washington. - Determination: Distribution does not overlap Project area.			
Fishes	**pygmy whitefish**	*Prosopium coulterii*	SS	--
	- Habitat/Distribution: Only known population in King County is in Chester Morse Lake and associated portions of the Cedar and Rex Rivers (tributaries for breeding); all populations in Washington are believed to have been identified. - Determination: Distribution does not overlap Project area.			
	margined sculpin	*Cottus marginatus*	SS	--
	- Habitat/Distribution: Confined to the Tucannon and Walla walla drainages in southeastern Washington. - Determination: Distribution does not overlap Project area.			

Wildlife Type	Common Name	Scientific Name	Listing Status[1]	
			State	Federal
	Olympic mudminnow	*Novumbra hubbsi*	SS	--
	- Habitat/Distribution: Known populations in southern and western lowlands of the Olympic Peninsula, the Chehalis and lower Deschutes River drainages, and south Puget Sound lowlands west of the Nisqually River. Habitat requirements include soft mud bottom substrate, little to no water flow, and abundant aquatic vegetation. - Determination: Distribution approaches the Project area; however, habitat present in the Project area would not support the species.			
Insects	**Mardon skipper**	*Polites mardon*	SE	FSC
	- Habitat/Distribution: Distribution in Puget Prairie (Pierce and Thurston counties) and South Cascades (Klickitat and Yakima counties). - Determination: Distribution does not overlap Project area.			

[1] Listing Status Codes:
SE = State Endangered SS = State Sensitive
ST = State Threatened FSC = Federal Species of Concern

[2] depending upon subspecies.

Priority Species

WDFW's Priority Habitat and Species (PHS) data were also reviewed for the Project vicinity (PHS on the Web). Other than salmonid fish use in May Creek, no other PHS features are mapped in or near the power line corridor in Newcastle. According to WDFW's online databases (PHS on the Web and SalmonScape), salmonid species known to occur in May Creek are cutthroat trout, sockeye salmon, Chinook salmon, steelhead, and coho salmon, thereby establishing May Creek as a Fish and Wildlife Habitat Conservation Area (FWHCA).

In addition to reviewing WDFW's database (PHS on the Web) for known PHS locations, the *Priority Habitats and Species List* (WDFW 2008) was reviewed in conjunction with species' known distribution, range, and habitat, to determine the likelihood of priority species' association with observed habitat in the Project area. A list of 95 priority species for King County (WDFW 2013) were reviewed for this assessment. The vast majority are not expected in the Project area, using the same process outlined in Table 2, due to a lack of suitable habitat types or special habitat features.

Priority species that have the greatest potential to utilize habitat in the corridor are Columbian black-tailed deer and pileated woodpecker. Both of these species were briefly observed (traveling) in the vicinity of the transmission line corridor

during field work activities and are relatively common in urban settings. They are discussed below.

Columbian black-tailed deer are Washington's most common deer sub-species. They are relatively tolerant of disturbance and occur in a variety of habitats from residential areas and logged lands to coniferous forests. Their priority-species status is based upon recreational, commercial, and/or tribal importance (WDFW 2008). Local populations and habitat areas are not considered to be in jeopardy. Columbian black-tailed deer are not dependent upon habitat in the Project corridor. Furthermore, habitat in the corridor is not expected to be significantly altered by the proposed transmission line upgrade. Columbian black-tailed deer use of the corridor is expected post-Project construction. Temporary construction activities have the potential to affect the distribution of some individuals. Deer are expected to avoid construction activities by moving to other habitat areas. There are no areas in the corridor that are considered a FWHCA based upon association with Columbian black-tailed deer at this time.

Pileated woodpeckers most often nest in old-growth forest and mature forest stands. However, they are increasingly found in urban areas as long as there are large trees that can provide roosting and nesting habitat. In general, the Project area does not contain the appropriate vegetation to support this species due to the vegetation management requirements associated with the power lines; however, pileated woodpeckers have been known to use utility poles for nesting. Suitable habitat exists adjacent to the corridor in green spaces in the vicinity of Lake Boren and in May Creek Park.

If pileated woodpeckers are observed excavating poles within the Project area, PSE avian biologists will be consulted to determine whether the pole is being used for nesting or foraging. If a pole is determined to be in use for foraging by pileated woodpeckers, the Project will have minimal effects by potentially causing temporary disturbance to foraging behavior. If pileated woodpecker nests are found, depending on nest occupancy, a PSE avian biologist will develop and implement a strategy to prevent impacts to the pileated woodpeckers during the nesting season in coordination with WDFW during construction and maintenance activities.

There are no areas in the corridor that are considered a FWHCA based upon association with pileated woodpecker at this time. Even so, recommended mitigation strategies and BMPs currently proposed include the creation of habitat snags, retaining stumps, and placement of

large woody debris, consistent with WDFW's general management recommendations for this species (Lewis and Azerrad 2003).

Other priority species that may use the corridor specifically while traveling or foraging include Townsend's big-eared bat, Vaux's swift, purple martin, and band-tailed pigeon. However, these species are not closely associated with habitat provided by the existing transmission line corridor. Any disturbance from Project-related activities would be temporary and would not impede the foraging of nearby habitats.

Species of Local Importance, Ponds, Waters of the State

The City of Newcastle does not currently maintain or regulate a list species of local importance. Furthermore, no naturally occurring ponds of under 20 acres are present in the Project area. However, in addition to May Creek, Streams MB01 and MN01, also considered Waters of the State, would be regulated under this section as a FWHCA.

FWHCA Summary

PSE implements an Avian Protection Plan to protect avian wildlife from harmful interactions with their utility equipment. The Plan includes preventing the creation of potentially harmful nests and monitoring known nest sites when construction activities occur in close proximity during the nesting season (Puget Sound Energy n.d.). Potential Project impacts to birds that could be expected to utilize habitat in the Project area are mitigated through the PSE's bird protection programs and procedures.

To summarize, Streams MB01, MN01 and MN02 (May Creek) are considered Fish and Wildlife Habitat Conservation Areas under NMC 18.24.302(A)(2 and 6). The associated stream buffers and critical area regulations for streams are expected to adequately protect these habitat areas for the duration of the Project. While Columbian black-tailed deer and pileated woodpecker are expected to utilize the Project corridor, they are not closely associated with the available habitat and proposed activities are not expected to significantly affect the use of the corridor by these species. At this time no additional FWHCAs are considered to be present in the Project area.

4.3.4 Erosion Hazard Areas

According to NMC 18.06.215, erosion hazard areas are defined as follows:

> *Those areas in the city of Newcastle underlain by soils which are subject to severe erosion when disturbed. Such soils include but are not limited to those classified as having a severe to very severe erosion hazard according to the USDA National Resources Conservation Service, the 1973 King County Soils Survey or any subsequent revisions or addition by or to these sources. These soils include, but are not limited to:*

A. Any occurrence of river wash ("Rh") and any of the following when they occur on slopes 15 percent or steeper:

1. The Alderwood gravelly sandy loam (AgD);

2. The Alderwood and Kitsap soils (AkF);

3. The Beausite gravelly sandy loam (BeD and BeF);

4. The Kitsap silt loam (KpD);

5. The Ovall gravelly loam (OvD and OvF);

6. The Ragnar fine sandy loam (RaD); and

7. The Ragnar-Indianola Association (RdE); and

B. Those which represent significant risk to sensitive receiving waters due to the proximity to those receiving waters and the size of the disturbed area. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-311 § 1; Ord. 2000-224 § 8; Ord. 45 § 1, 1994; Ord. 18 § 1, 1994).

Erosion hazard areas are mapped in the majority of the Project corridor from just west of Lake Boren, south to SE 95th Way. Mapped erosion hazard areas are generally located in developed residential areas with the exception of the May Creek ravine.

Due to their largely uniform presence in the corridor, erosion hazard areas are not depicted in the attached maps (Appendix A). However, erosion hazard areas were evaluated by GeoEngineers, specifically in the vicinity of May Creek as documented in their *Revised Targeted Critical Areas Geologic Hazard Evaluation* for Newcastle revised September 2017 (hereafter GeoEngineers Report; Appendix C). A detailed discussion of proposed Project impacts to geologic hazard areas is discussed in Section 7 of this report.

4.3.5 Landslide Hazard Areas

Newcastle defines landslide hazard areas as follows (NMC 18.06.353):

Those areas in the city subject to severe risks of landslides, including the following:

A. Any area with a combination of:

1. Slopes steeper than 15 percent;

2. Impermeable soils, such as silt and clay, frequently interbedded with granular soils, such as sand and gravel; and

3. Springs or groundwater seepage;

B. Any area which has shown movement during the Holocene epoch, from 9,700 BC, or which is underlain by mass wastage debris from that epoch;

C. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action;

> *D. Any area which shows evidence of or is at risk from snow avalanches;*
>
> *E. Any area located on an alluvial fan, or in or below a ravine or canyon presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported sediments; or*
>
> *F. Areas of historic failures, such as areas designated as earthflows, mudflows, or landslides on maps published by the U.S. Geological Survey, Washington State Department of Natural Resources, and/or other research meeting the best available science criteria in WAC 365-195-915.*

One landslide hazard area is mapped in the Project area, associated with the May Creek ravine. The landslide hazard area was evaluated by GeoEngineers as documented in the GeoEngineers Report (Appendix C). A detailed discussion of proposed Project impacts to geologic hazard areas is discussed in Section 7 of this report.

4.3.6 Steep Slope Hazard Areas

Steep slope hazard areas are defined as follows (NMC 18.06.536):

> *Those areas on slopes 40 percent or steeper within a vertical elevation change of at least 10 feet. A slope is delineated by establishing its toe and top and is measured by averaging the inclination over at least 10 feet of vertical relief. For the purpose of this definition:*
>
> *A. The toe of a slope is a distinct topographic break in slope which separates slopes inclined at less than 40 percent from slopes 40 percent or steeper. Where no distinct break exists, the toe of a steep slope is the lowermost limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet; and*
>
> *B. The top of a slope is a distinct, topographic break in slope which separates slopes inclined at less than 40 percent from slopes 40 percent or steeper. Where no distinct break exists, the top of a steep slope is the uppermost limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet.*

Steep slopes, or land where the slope meets or exceeds 40 percent, are present throughout the corridor. Steep slopes (other than steep slope hazard areas, discussed subsequently), are not depicted in the attached maps (Appendix A). Steep slope hazard areas, or steep slopes that have a vertical elevation change of at least 10 feet, are regulated as critical areas in the NMC and are concentrated in the May Creek drainage. Project impacts to geologic hazard areas is discussed in Section 7 of this report.

5 REGULATIONS

5.1 Local Regulations

5.1.1 Wetlands and Streams

As noted above, critical areas are regulated under Chapter 18.24 (Critical Areas) of the Newcastle Municipal Code (NMC). A summary of relevant wetland and stream critical area classifications and standard buffer widths is provided Appendix B and presented again in Tables 3 and 4, below.

Per NMC 18.24.315(A)(3), for wetland buffers,

> *The standard buffer widths assume that the buffer is vegetated with a native plant community appropriate for the ecoregion. If the existing buffer is unvegetated, sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer should either be planted to create the appropriate plant community or the buffer should be widened to ensure that adequate functions of the buffer are provided.*

The standard buffers of Wetlands MN01 and MN02 are not vegetated with native plant communities. Vegetation in these wetland buffers is dominated by a mix of herbaceous species common in the maintained transmission line corridor with patches of Himalayan blackberry and other non-native ornamental species. Therefore, Newcastle requires that these standard buffer widths be increased to ensure adequate functions are provided (NMC 18.24.315[A][3]); however, the extent of the buffer width increase is not specified in this instance. By comparison, for high impact land uses (the transmission line corridor is consistent with a moderate impact use, per NMC 18.24.315[A][6][b]), a 33 percent buffer increase is required if mitigation measures in NMC 18.24.316(A) are not implemented (NMC 18.24.315[A][2]). One of these mitigation measures is to replace non-native plants with native vegetation, consistent with NMC 18.24.315(A)(3), above. PSE is proposing to improve the buffer of May Creek (see Section 8), as opposed to the buffers of Wetlands MN01 and MN02, to achieve equivalent or greater critical area functions and values compared to existing conditions. Therefore, a 33 percent increase in the buffers of Wetlands MN01 and MN02 has been presumed, consistent with Newcastle's requirements for wetlands in high intensity land uses.

Both Wetlands MN01 and MN02 rate as a Category III wetlands. Category III wetlands with a moderate intensity land use require a standard buffer width of 60 feet. By increasing buffer widths by 33 percent, the resulting buffer widths are 80 feet as shown in Table 3, below.

Table 3. Summary of wetland critical area classifications and buffer widths.

Wetland Name	2014 Ecology Wetland Rating				Category	Standard Buffer Width (feet)	Increased Buffer Width (feet)
	Water Quality	Hydrologic Function	Habitat	Total			
MN01	6	7	3	16	III	60	80
MN02	7	6	3	16	III	60	80

Stream buffers are determined based on stream classification (NMC 18.24.307). Newcastle classifies streams according to the water typing system in WAC 222-16-030 (NMC 18.24.306[A]). Under this system, May Creek is a Type F stream requiring a 100-foot buffer and Streams MB01 and MN01 are Type Ns streams requiring 25-foot buffers (Table 4).

Table 4. Summary of stream critical area classifications and buffer widths.

Stream Name	Stream Type	Buffer (feet)
MB01	Type Ns	25
MN01	Type Ns	25
MN02 – May Creek	Type F	100

5.1.2 Geologic Hazard Areas

Steep slope hazard areas and landslide hazard areas require 50-foot buffers from all edges of the hazard area per NMC 18.24.300 and 18.24.270, respectively. Erosion hazard areas do not require buffers.

5.2 Alteration of Critical Areas and Buffers

In general, Newcastle will not allow critical areas to be filled, graded, or altered. The NMC requires that an applicant adjust proposed site plans to avoid and/or minimize impacts to critical areas and their respective buffers (NMC 18.24.125).

5.2.1 Wetland and Stream Buffers

The City may approve alterations in wetland and stream buffer areas for utility corridors (NMC 18.24.320 and 18.24.308, respectively), if certain criteria are met and impacts are appropriately mitigated. Demonstration of Project compliance with applicable criteria are provided in Section 9 of this document.

For alterations to wetland and stream buffers (that result in a developed condition), the City's preference is to mitigate onsite followed by mitigation implementation in the same drainage sub-basin. Mitigation shall occur on a 1:1 areal and functional basis (NMC 18.24.309[C][1] and 18.24.325).

In addition to permanent wetland and/or stream buffer impacts (pole installation), the Project will permanently impact some wetland and stream buffer areas through vegetation removal/conversion. Interagency guidance for mitigating this type of impact (in wetlands, specifically) is as follows (Ecology et al. 2006):

> *Loss of functions due to the permanent conversion of wetlands from one type to another also requires compensation. For example, when a forested wetland is permanently converted to an emergent or shrub wetland (e.g., for a utility right-of-way) some functions are permanently lost or reduced.*
>
> *The ratios for conversion of wetlands from one type to another will vary based on the type and degree of the alteration, but they are generally one-half of the typical ratios for permanent impacts.*

Where functioning wetland or stream buffers are impacted by a conversion of vegetation (not fill or grading), the proposed minimum mitigation ratio to off-set impacts is 0.5:1, consistent with the guidance for this type of impact to wetland areas.

Temporary wetland and stream buffer impacts are typically required to be restored in-place at a 1:1 ratio.

5.2.2 Geologic Hazard Areas and Associated Buffers

Where construction activities or vegetation removal is proposed in geologic hazard areas and/or associated buffers, assessment by a qualified professional is required. Proposed alterations to erosion hazard areas, landslide hazard areas, steep slope hazard areas, and associated buffers have been evaluated by GeoEngineers; findings are incorporated in this report and included as Appendix C.

The City of Newcastle may allow alterations to landslide and steep slope hazard areas for public and private utility and utility corridors if it is demonstrated that the alterations involved will not subject the critical area to an increased risk of landslide or erosion and vegetation removal is limited to the minimum necessary to locate the utility or construct the corridor (NMC 18.24.270[B][2] and 18.24.300[3][a]). In addition, certain activities are allowed on erosion hazard areas pursuant to the development standards and mitigation requirements in NMC 18.24.210 and 18.24.215.

Project compliance with these aforementioned criteria is provided in Section 9 and Appendix C.

6 MITIGATION SEQUENCING

Pursuant to NMC 18.24.125, attempts to avoid and minimize impacts to the critical areas and associated buffers located in the Project corridor have been taken.

Avoidance

Proposed new poles have been located to avoid any direct impacts to wetlands, streams, landslide hazard areas, and steep slope hazard areas. Completely avoiding pole impacts to erosion hazard areas is not feasible due to the prevalence of mapped erosion hazard areas in the Project area. Furthermore, pole replacement activities associated with the transmission line upgrade must occur in specific locations for proper functioning of the electrical system due to complex engineering considerations making pole placement in erosion hazard areas and in some critical area buffers unavoidable. Where avoidance wasn't possible, PSE worked with engineers to minimize impacts through design revisions; such changes reduced pole footprints and increased line heights to avoid critical area impacts to the extent feasible.

Temporary impact areas associated with construction access, pole construction work areas, and stringing sites also avoid critical areas to the extent feasible. For example, specific pole construction work areas have been adjusted to exclude critical areas on a pole by pole basis.

Minimization

Minimization techniques were utilized during the design process in order to limit impacts to critical areas and their associated buffers. Minimization measures included the following:

1. Utilizing the existing transmission line corridor, which has experienced significant disturbance as a result of adjacent development and ongoing corridor maintenance.

2. When working within a critical area, limiting the construction disturbance to the minimum feasible size around each pole and access point.

3. Installing 230 kV transmission lines between poles with minimal site disturbance. Where feasible given maximum distance allowed between poles, the poles will be located outside of critical areas. Transmission lines will span above critical areas, minimizing ground disturbance, vegetation removal, and loss of critical area function.

4. Where vegetation removal is required in critical areas, trees will be accessed by foot, stumps will be left in the ground, and debris will be chipped or dispersed as appropriate, preventing critical area disturbance by large heavy equipment.

Mitigation

To off-set unavoidable critical area impacts associated with the Project, mitigation will occur in accordance with NMC 18.24.130. Mitigation is expected to include restoration of temporary impacts (including maintenance of slope stability) and stream buffer enhancement in order to achieve equivalent or greater critical area functions and values compared to existing conditions. Mitigation needs have been calculated based upon anticipated impacts. The Final Mitigation Plan is included in this report; the approach and plan are discussed in Section 8.

7 Unavoidable Project Impacts

Impact types resulting from the Project have been quantified based upon the long-term condition of the proposed work areas and existing land cover types in the corridor. Quantified impacts have been characterized as one of four types using this analysis and include permanent, conversion, temporary, and no change. A summary of the impact types based on proposed work and existing land cover is provided in Table 5.

Permanent impacts are characterized as a change from a vegetated critical area to a transmission line pole. No permanent impacts are proposed in wetlands, streams, landslide hazard areas, or steep slope hazard areas. The quantity of permanent impacts occurring in wetland/stream buffers is used to determine mitigation needs based upon the City requirements outlined in Section 5.2. Impacts to erosion hazard areas and geologic hazard area buffers are addressed by GeoEngineers (Appendix C) and summarized in the following sub-sections.

Impacts that result in vegetation conversion are caused by vegetation management activities resulting in a shift from forested to shrubby or herbaceous vegetation. These impacts will be limited to disturbance of vegetation; soils will remain intact. Vegetation conversion impacts require mitigation when they occur in wetland and/or stream buffers, but since the magnitude of impact is less than permanent impacts, a reduced mitigation ratio is proposed using interagency guidance (Ecology et al. 2006). Wetland and stream buffer impacts that result in a vegetation conversion will be mitigated at one-half the typical ratio (0.5:1), at a minimum, for permanent buffer impacts to vegetation discussed in Section 5.2.

Quantified vegetation conversion impacts are also presented for geologic hazard areas. However, this measure of impact was not relied upon by geotechnical professionals when assessing Project impacts in respective critical areas. GeoEngineers based their analysis on a review of geologic maps and geologic hazard maps, digital imagery, site visits, and PSE site plans (which included trees to be removed but not canopy loss). Conversion impacts in geologic hazard areas are presented for consistency and also to provide the reader with a comprehensive understanding of Project impacts. Conversion impacts in geologic hazard areas do not directly correlate to mitigation requirements as they do for wetland and stream critical area buffers.

Temporary impacts will occur in geologic hazard areas and associated buffers, and wetland and stream buffers as part of the following activities: pole installation, maintenance, and removal; and construction access route re-establishment/use. These areas will be restored in-place after construction work is complete.

Where no change is anticipated, due to the existing land cover type in the Project area, no mitigation is required. Impact results categorized as no change have not been reported.

Permanent, conversion, and/or temporary Project impacts are proposed in erosion hazard areas, and buffers associated with wetlands, streams, steep slope and landslide hazard areas. In addition to quantifying impacts by area, impacts have been qualitatively assessed by a qualified professional for each critical area type to be impacted. The results of the quantitative and qualitative analyses are discussed in the following sub-sections.

Table 5. Matrix used for determining impact types based upon long-term condition of proposed activities and existing land cover types in critical areas and associated buffers.

			Existing Land Cover Types					
			Forested to be Removed		Forested to Remain		Understory only	Other (mostly lawn)
	Impact Description	**Long Term Condition[1]**	with under story	no under story	with under story	no under story		
Proposed Activities	Pole footprint (actual footprint of pole structure based on engineering drawings from PSE)	Developed	P	P	P	P	P	P
	Pole buffer (6 foot radius outside of pole footprint)	Mixed vegetation[2]	C	C	T	T	T	T
	Access routes (20 foot width based on alignments from PSE)	Mixed vegetation[2]	C	C	T	T	T	T
	Pole construction work area	Mixed vegetation[2]	C	C	T	T	T	T
	Wire Zone	Mixed vegetation[2]	C	C	NC	NC	NC	NC
	Managed ROW	Mixed vegetation[2]	C	C	NC	NC	NC	NC
	Legal ROW	Mixed vegetation[2]	C	C	NC	NC	NC	NC

Type of Impact based on proposed activity, long term condition, and existing land cover type: P = Permanent, C = Conversion, T = Temporary, NC = No Change

[1] Long term condition determined in coordination with PSE.

[2] Subject to varying height restrictions described in Section 3.3.4.

7.1 Critical Area Impacts

7.1.1 Wetland and Stream Buffer Impacts

Impacts are proposed to wetland and stream buffers in the Project corridor in Newcastle. Two new poles (totaling 14 SF) will replace four existing poles (totaling 24 SF) in the functioning buffer area associated with Wetland MN01, resulting in the *removal* of 10 square feet of fill, actually a net benefit to the critical area rather than an impact. Vegetation conversion impacts located in wetland and stream buffers result from the removal of 21 trees and total 2,859 SF. Temporary impacts occur in the buffers of Stream MN01, Wetland MN01, and Wetland MN02 and total 3,981 SF (Table 6).

Note that while the buffers of Stream MN01 and Wetland MN01 are depicted as overlapping on the CAIA maps in Appendix A, the majority of impacts generated in the Wetland MN01 buffer area are located outside of the 25-foot buffer of Stream MN01. No permanent or conversion impacts to Stream MN01 or its associated buffer are currently proposed.

A qualitative description of buffer impacts can be found in Section 7.2 (Functional Lift Analysis) followed by a description of the mitigation activities proposed to compensate for the impact.

Table 6. Wetland and stream buffer impacts by wetland and/or stream feature.

	Impact Type	Area of Net Impact (SF)	Source of Impact
Stream MB01 Buffer	Permanent	0	None
	Conversion	101	Removal of vegetation
	Temporary	0	None
Stream MN01 Buffer	Permanent	0	None
	Conversion	0	None
	Temporary	31	Pole work area
Wetland MN01 Buffer	Permanent	-10	Pole footprints; existing impact from pole footprints is reduced.
	Conversion	79	Removal of domestic apple tree (tree inventory #805)
	Temporary	1,138	Access route, pole buffer, and pole work area

	Impact Type	Area of Net Impact (SF)	Source of Impact
Stream MN02 (May Creek) Buffer	Permanent	0	None
	Conversion	2,478	Vegetation management in legal ROW, managed ROW, and wire zone
	Temporary	0	None
Wetland MN02 Buffer	Permanent	0	None
	Conversion	201	Removal of domestic apple tree (tree inventory #1422)
	Temporary	2,812	Access route
Total Impacts to Wetland and Stream Buffers:		Permanent	-10 SF
		Conversion	2,859 SF
		Temporary	3,981 SF

7.1.2 Geologic Hazard Area Impacts and Associated Buffer Impacts

Impacts to geologic hazard areas and associated buffers have been reviewed by GeoEngineers based on PSE's proposed activities. As stated previously, erosion hazard areas are present throughout the Project area. Steep slope hazard areas are generally concentrated near the May Creek drainage. The May Creek drainage is also the only location of mapped landslide hazard areas in the Project area in Newcastle. Erosion hazard areas are mapped in the majority of the Newcastle corridor, however, most are located within residential developed areas; as such, GeoEngineers focused their review of erosion hazard area impacts in the May Creek drainage.

No direct impacts (*i.e.*, pole installation) are proposed in landslide hazard areas or steep slope hazard areas (Table 7). Two existing poles will be removed from steep slope hazard area buffers and two poles are proposed in geologic hazard area buffers. In erosion hazard areas, 16 new poles will replace 32 existing poles.

Table 7. Impacts associated with pole replacement in Project area including number of poles and total square footage of poles.

Geologic Hazard Area or Associated Buffer	Number of New Poles (and proposed size in SF)	Number of Poles being Removed[1] (and existing size in SF)
Erosion Hazard Area	16 (130)	32 (190)
Landslide Hazard Area	0	0
Landslide Hazard Area Buffer	2 (14)[2]	0
Steep Slope Hazard Areas	0	0
Steep Slope Hazard Area Buffer	1 (7)[3]	2 (12)[2]

[1] Per GeoEngineers Report (Appendix C), for poles located in geologic hazard areas, old poles should be cut one to two feet below the ground surface, leaving the remaining portion of the pole below ground in place in order to minimize impacts.

[2] These poles are also located in, and accounted for, in erosion hazard areas.

[3] This pole is also located in, and accounted for, in landslide hazard area buffer and erosion hazard area.

Vegetation management activities will also result in impacts to geologic hazard areas. Impacts quantified by canopy removal are presented in Table 8 below as vegetation conversion, and are caused by tree removal associated with the Project. Vegetation conversion quantities presented here were not utilized by GeoEngineers in their analysis of Project impacts to geologic hazard areas.

GeoEngineers' review of geologic hazard areas included a site visit to evaluate the landslide, steep slope, and erosion hazard areas along the slopes of May Creek within the Project area. No active slope movement or instability was reported based on this site visit. Additionally, the utility corridor was found to be actively maintained as a result of the existing utilities, especially the pipelines (regularly mowed grass, no trees). GeoEngineers determined that PSE's proposed work was not anticipated to impact the geologic hazard areas in the May Creek drainage (provided no tracked or rubber-tired equipment is used to remove trees), especially when compared to the management activities of the existing pipeline ROW. Recommended mitigation strategies are discussed in Section 8 of this report.

Refer to the GeoEngineers Report for additional details (Appendix C).

Table 8. Vegetation conversion impacts to geologic hazard areas in the Project area.

Geologic Hazard Area or Associated Buffer	Vegetation Conversion (SF)	Source of Impact
Erosion Hazard Area	26,174	Access route, wire zone, managed ROW, legal ROW, pole buffer, and pole work area
Landslide Hazard Area	6,734	Wire zone, managed ROW, and legal ROW
Landslide Buffer	446	Wire zone, managed ROW, legal ROW, and pole work area
Steep Slope Hazard Areas	0	None
Steep Slope Hazard Area Buffer	5,350	Wire zone, managed ROW, legal ROW, and pole work area

7.2 Functional Lift Analysis

Wetland and stream functional buffers have been qualitatively assessed, in addition to the quantitative analysis presented above. For the purposes of this section, the pre-existing condition of the Project area is compared against the proposed post-Project condition to ensure that no net loss of critical area functions is achieved.

In general, proposed wetland and stream buffer impacts are located in areas that are disturbed and dominated by invasive plants such as non-native blackberry. The majority of these impacts are classified as a vegetation conversion that involve removal of native and non-native trees from buffer areas. Table 9 below summarizes existing and proposed conditions by wetland and/or stream buffer area.

Table 9. Descriptions of general impact area conditions and proposed changes.

Critical Area	Existing and Proposed Conditions
Stream MB01 Buffer Vegetation Conversion: 101 SF	**<u>Existing Conditions:</u>** Maintained with non-native ornamental plants associated with a private property backyard.  *Photo from Bing Maps Streetside view of vegetation growing in Stream MB01 buffer, largely located on residential property (view looking northwest from Newcastle Way). Imagery date: 8/26/2017*
	<u>Proposed Conditions:</u> • Remove one deciduous tree or large shrub within Newcastle city limits; other impacts to feature occur in Bellevue city limits.

Critical Area	Existing and Proposed Conditions
Wetland MN01 Buffer Permanent Impacts: -10 SF Vegetation Conversion: 79 SF	**<u>Existing Conditions:</u>** Wetland, stream and buffer areas are disturbed and dominated by herbaceous vegetation, Himalayan blackberry, Scotch broom, and ornamental/installed non-native trees.  *Photo of vegetation growing in Wetland MN01 and the associated wetland/stream buffer (view looking north along the east easement edge). Date taken: 4/26/2017*
	<u>Proposed Conditions:</u> • Remove four existing poles and replace with two new poles resulting in a net removal of 10 square feet of fill. • Remove one domestic apple tree (#805: maximum potential height of 30 feet, 10 feet tall with a canopy radius of 5 feet and in poor condition).

Critical Area	Existing and Proposed Conditions
Stream MN02 (May Creek) Buffer Vegetation Conversion: 2,478 SF	**<u>Existing Conditions:</u>** May Creek buffer areas are disturbed and dominated by a mix of native and non-native invasive vegetation. Native vegetation growth is confined to the topographically low area adjacent to May Creek and the east and west edges of the PSE easement; native plants are generally dominated by red alder and bigleaf maple trees. Non-native, invasive plants are predominately Himalayan blackberry, reed canarygrass, and herb Robert. A maintained, herbaceous pipeline corridor is also present in the center of the PSE easement.  *Photo of vegetation growing in the May Creek ravine (view looking north along the east easement edge). Date taken: 5/4/2015*

	<u>Proposed Conditions:</u>
	• Remove a total of 18 red alder and bigleaf maple trees.
	• Mitigate vegetation conversion impacts in the May Creek buffer in addition to minor impacts proposed in the buffers of Stream MB01, Wetland MN01, and Wetland MN02.
	  – Remove invasive vegetation
	  – Install native, transmission-line appropriate vegetation in corridor, including low-growing trees, shrubs, and mowable pollinator-friendly herbaceous vegetation.
	  – Snag or hinge-fall trees proposed for removal
	  – Place large woody debris in accordance with GeoEngineers' recommendations.

Critical Area	Existing and Proposed Conditions
Wetland MN02 Buffer Vegetation Conversion: 201 SF	**Existing Conditions:** Wetland and buffer areas are disturbed and dominated by herbaceous vegetation and Himalayan blackberry.  *Photo of vegetation growing in the Wetland MN02 and the associated buffer (view looking north). Date taken: 4/26/2017*
	Proposed Conditions: • Remove one domestic apple tree (#1422: maximum potential height of 30 feet, 20 feet tall with a canopy radius of 8 feet and in fair condition). • Permanent impacts associated with apple tree removal will be mitigated in May Creek buffer area.

7.2.1 Buffer Areas of Stream MB01, Wetland MN01 and Wetland MN02

Proposed impacts to the functioning buffers areas of Stream MB01, Wetland MN01 and Wetland MN02 consist of a net reduction of fill by 10 square feet, expected to slightly improve the biological functions of the associated critical area and buffer. Vegetation impacts consist of the removal of three small non-native trees, two of which are located in the expanded portion of the wetland buffers, as opposed to the standard buffers. These impacts are relatively minor and expected to have no measurable effect on water quality or hydrology to the respective critical areas; impacts to habitat are also expected to be minor, but more apparent.

Trees proposed for removal are assumed to provide some water quality and hydrologic functions through interception of water (rainfall) and uptake of

groundwater and nutrients. While these trees and their associated functions will be removed, the affected area will be left to become revegetated, likely with herbaceous vegetation or Himalayan blackberry as is common in this portion of the corridor. The water quality and hydrologic functions provided by potential replacement vegetation is expected to be comparable in water quality and hydrologic function to the existing small trees. Therefore, the net effect on water quality and hydrologic buffer functions anticipated from removing these three trees from respective buffer areas, is not expected to be significant.

Existing apple trees located in critical area buffers do provide some habitat functions. In general, they are located in areas of the corridor where vegetation is predominantly maintained as herbaceous or shrub (Himalayan blackberry), providing some structural diversity in a fairly homogenous area. The apple trees also provide forage opportunities for urban birds and other urban wildlife (deer, squirrels, raccoons, birds, etc.). Removal of the apple trees is expected to reduce the structural and vegetative species diversity of the wetland buffer areas as well as reduce forage opportunities for some urban wildlife species. However, the overall character (*i.e.*, managed corridor dominated by non-native species) and habitat functions of these buffer areas is not expected to change significantly as a result of the limited vegetation management proposed.

Temporary impacts will incorporate standard BMPs and temporary erosion and sediment control (TESC) measures to minimize impacts to downstream water quality and hydrologic functions of the critical area buffer. Vegetation impacted in temporary work areas is expected to rebound within one growing season.

Net Condition

The functional buffer area will be increased by 10 square feet and maintained in a manner very similar to existing conditions. The removal of two non-native domestic apple trees and one deciduous small tree or shrub is not expected to significantly change the water quality or hydrologic functions of the respective wetland/stream buffer areas compared to existing conditions. A slight reduction in the variety of foraging habitat and vegetative structure for urban wildlife species is anticipated. However, the overall vegetation composition of the area is not expected to change substantially. Overall, the proposed change in the buffer functions related to Stream MB01, Wetland MN01, and Wetland MN02 is considered to be insignificant. Regardless, mitigation for impacts is proposed in the May Creek buffer. Refer to Section 8 for a discussion of the mitigation plan.

7.2.2 May Creek Buffer Area

By comparison, vegetation conversion impacts to the buffer of May Creek are more substantial than those proposed to the buffer areas of Wetlands MN01 and MN02. The increased vegetation management requirement of the new lines will require the removal of 18 native, deciduous trees currently growing in the stream

buffer. Most of these trees typically range in size from 3 to 10 inches diameter at four-and-a-half feet above the ground (DBH). Removal of these trees is expected to impact the functions of the May Creek buffer (which overlaps mapped landslide hazard areas, steep slopes and/or associated slope buffers, and is associated with a known FWHCA).

As stated previously trees perform water quality and hydrologic functions through interception of rainfall and uptake of groundwater and nutrients. Native trees also provide important habitat functions. At this location in particular, trees provide cover and shade to May Creek and support a corridor along May Creek (albeit disturbed in the PSE/pipeline easement) in which terrestrial and aquatic wildlife species may travel. Native trees are also expected to provide potential breeding and foraging habitat to some urban wildlife species. Tree removal, without mitigation would diminish the water quality, hydrologic, and habitat buffer functions at this location.

Tree removal is not expected to significantly disturb understory vegetation and soils. Trees in the May Creek buffer (which overlaps a landslide hazard area, erosion hazard area, steep slope hazard area, and steep slope hazard area buffer) will be accessed by foot and removed by hand-cutting with chainsaws per GeoEngineers recommendations. In addition, stumps will remain in the ground and tree debris scattered within the ROW. Non-native invasive plants (*i.e.*, Himalayan blackberry and Scotch broom) dominant in nearby areas of the corridor have the potential to become established where vegetation removal is proposed.

In order to mitigate for Project impacts and prevent further degradation of the May Creek buffer that could be expected to follow the removal of native trees, mitigation for all wetland and stream buffer impacts is proposed in the May Creek buffer. Mitigation at this location is also expected to improve the associated landslide hazard area, steep slope hazard area and/or associated buffers, and FWHCA.

Mitigation activities are expected to include the following:

- snagging suitable trees currently proposed for removal;
- hinge-felling smaller diameter trees;
- strategic placement of salvaged large woody debris to be consistent with GeoEngineers' recommendations for slope stability;
- removal of invasive plant species; and
- installation of a dense and diverse community of native, transmission-line appropriate plants including low-growing trees, shrubs, and mowable pollinator-friendly herbaceous vegetation.

The specific location and size of the mitigation area is presented in the Final Mitigation Plan, which has been designed to appropriately replace functions lost as a result of vegetation conversion in the May Creek buffer. The mitigation area is increased from the minimum areal requirement determined in Section 8 as necessary in order to adequately compensate for proposed impact to buffer functions.

Net Condition

Mitigation activities are expected to maintain or improve water quality, hydrologic, and habitat functions of the May Creek buffer over existing conditions. Dense, native shrubs, groundcovers, and herbaceous vegetation are expected to compensate for the loss of water quality and hydrologic functions provided by larger trees. Habitat will be improved from existing conditions by increasing number of snags, hinge-felling smaller trees, placing large woody debris, removing invasive plant species, and installing a variety of native plants. Native plants will provide cover and forage opportunities for wildlife and improve pollinator habitat as well as aid in maintaining a wildlife travel corridor that crosses perpendicular to the transmission line corridor along May Creek. By mitigating wetland and stream buffer impacts at this location, other critical areas present also benefit including mapped landslide hazard areas, steep slope hazard areas and/or associated buffers, and FWHCAs. Refer to Section 8 for a discussion of the mitigation plan.

7.3 Cumulative Impacts

Impacts from past actions have shaped the Project vicinity since the mid-19th century, and continue to shape how Seattle and the Eastside are changing in response to development activities and trends. In general, landscape-scale and basin-level functions and processes are negatively impacted by increased impervious surface, critical area and buffer vegetation removal, and buffer area losses. This is common to urban areas like Newcastle which have experienced a general loss of upland forested, native meadow (pollinator habitat), riparian, and wetland habitat areas due to development. Urbanization tends to cause flashy stream hydrology, increased pollutant loads, sedimentation, and overall habitat loss, often resulting in few fragmented areas of high-value fish and wildlife habitat remaining in urban settings.

Other large projects such as Sound Transit's East Link Light Rail overlapping with the proposed Energize Eastside Project can contribute to these ongoing trends and cumulative impacts on high-value uplands and wetlands in the vicinity. These changes, along with additional urban development, continue to incrementally reduce remaining habitat areas and aquatic resources.

Although urbanization has resulted in an overall loss and degradation of available fish and wildlife habitat throughout the study area, current regulations and incentive programs have slowed the trend of habitat loss to a degree. In the case of fish passage, future permitted projects are likely to incrementally provide net benefit to habitat. Mitigation measures for these projects may include restoration or enhancement of degraded streams and wetlands and their associated buffers, thus providing water quality treatment for impervious surfaces that currently receive no treatment, removal of fish passage barriers, and planting of disturbed areas with native vegetation. Another example of habitat improvement is pollinator habitat conservation, restoration, and enhancement driven by federal programs and certifications that provide incentives for pollinator habitat restoration. These mitigation measures benefit fish and wildlife habitat when compared to existing conditions and improve conditions for federally listed threatened or endangered species, if present.

In the short term, the Energize Eastside Project would contribute to the overall trend of degradation directly by removing trees and altering available habitat conditions, and indirectly by continuing to supply energy to support a growing, developing region. As stated above, Project impacts in Newcastle are considered to be relatively insignificant in the buffers of Wetlands MN01, MN02, and Stream MB01, and the Project will increase these functional wetland buffers by 10 square feet. Where impacts are more substantial (*i.e.*, May Creek buffer), mitigation is proposed to compensate for impacts and replace associated functions and values. Project mitigation would help to reduce cumulative impacts, but will not immediately replace all habitat lost. Replacing large significant trees with smaller planting-sized trees would not fully replace the habitat functions provided by the existing conditions. Including snags and large woody debris in mitigation plans will help to address the loss of forested habitat values in the short term, and over time the loss of function would be further addressed as mitigation areas mature. Including pollinator habitat restoration in mitigation plans aims to offset historic and current degradation of this habitat type in urban areas.

Project impacts will be appropriately mitigated in order to minimize the Project's cumulative impacts to the May Creek sub-basin. No long-term impacts to water resources are expected as a result of the Project. Mitigation measures to compensate for impacts identified in this report are proposed in the Final Mitigation Plan.

8 MITIGATION

8.1 Wetland and Stream Buffer Mitigation Approach

As stated in Section 5, for alterations to wetland and stream buffers, Newcastle requires that compensatory buffer mitigation be developed preferably onsite and if not onsite, then in the same drainage sub-basin. Permanent buffer impacts must be mitigated on a 1:1 areal and functional basis. For vegetation conversion impacts, a reduced minimum mitigation ratio of 0.5:1 is proposed based on interagency guidance (Ecology et al. 2006).

In order to determine a mitigation strategy and satisfy City preferences, locations for potential mitigation activities were first determined. Since the Project is long and linear in nature, it passes through and generates varying degrees of impact to three different wetland/stream buffer areas in Newcastle. However, the overwhelming majority of impacts (87 percent) occur in the buffer area of Stream MN02 – May Creek. As such, the May Creek buffer was reviewed for mitigation potential. In the existing PSE easement, the buffer of May Creek is degraded and provides opportunity for restoration.

The May Creek buffer site provides enough opportunity and area to mitigate for all wetland/stream buffer impacts that occur in the Newcastle Project area. It is also the site that sustains the majority of Project impacts by a significant margin.

In general, mitigation sites are more successful when combined into fewer larger areas, rather than piecemealed across several smaller sites. Furthermore, Stream MB01 and Wetland MN01 and associated buffers are located on privately-owned property, which has the potential to make mitigation activities at these locations more challenging and possibly more prone to failure, particularly when considering property owner coordination and property access. Finally, as demonstrated in Section 7.2, the May Creek buffer is a suitable location for achieving an overall functional lift with respect to water quality, hydrologic, and habitat critical area functions. It also provides the opportunity to improve the functions of landslide hazard area, erosion hazard area, steep slope hazard area and/or associated buffers, and FWHCAs while mitigating for wetland and stream buffer impacts.

8.2 Wetland and Stream Buffer Mitigation Plan

The Final Mitigation Plan is designed to restore and enhance the May Creek buffer in the Project area. The plan accounts for utility maintenance needs, the existing gas pipeline easement, site topography, habitat connectivity, and vegetation height restrictions.

The Final Mitigation Plan includes notes that fulfill the mitigation and monitoring requirements of the Newcastle Municipal Code and provide clear direction for mitigation goals, performance standards, monitoring and maintenance protocols, and contingencies for the duration of the required five-year monitoring period.

Minimum mitigation needs (Table 10) were calculated based upon wetland and stream buffer impacts and the required minimum mitigation ratios presented in Section 5.2.

Table 10. Calculation of mitigation needs for wetland and stream functioning buffer impacts.

	Impact Type	Area of Impact (SF)	Proposed Mitigation Ratio	Buffer Mitigation Required (SF)
Stream MB01 Buffer	Permanent	0	1:1	0
	Conversion	101	0.5:1	51
			Total:	51
Wetland MN01 Buffer	Permanent	-10	1:1	0
	Conversion	79	0.5:1	40
			Total:	40
Stream MN02 (May Creek) Buffer	Permanent	0	1:1	0
	Conversion	2,478	0.5:1	1,239
			Total:	1,239
Wetland MN02 Buffer	Permanent	0	1:1	0
	Conversion	201	0.5:1	101
			Total:	101
			Grand Total:	**1,431**

Required minimum buffer mitigation in the May Creek sub-basin is 1,431 square feet. Opportunity to fulfill this buffer mitigation need exists in the PSE easement of the May Creek buffer on Newcastle-owned parcels (parcel numbers 3345100380 and 3345100445) as depicted in Figure 2 and includes approximately 10,700 SF of "mixed vegetation" planting area and 11,400 SF of "mowable herbaceous pollinator mix" planting area.

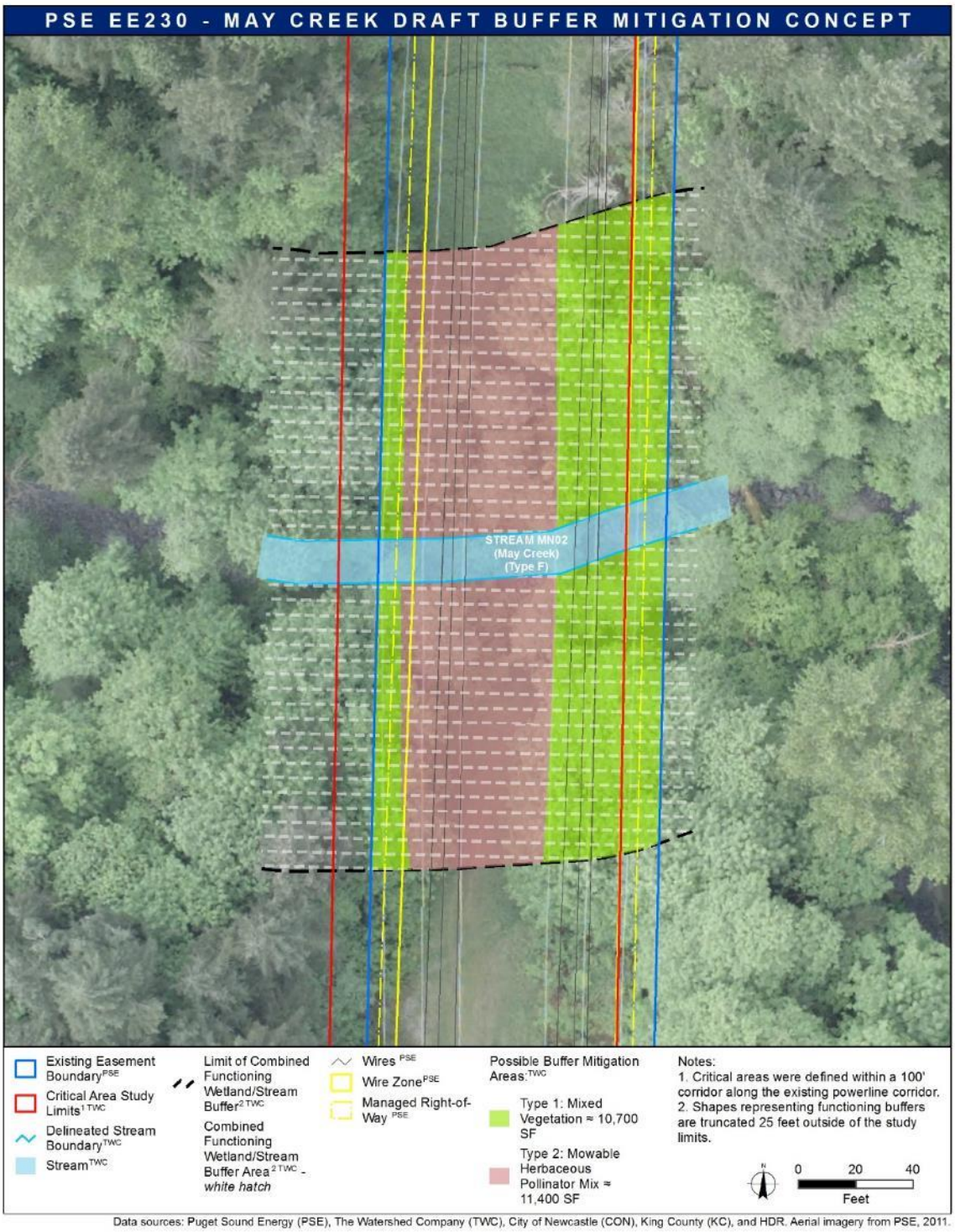

Figure 2. Mitigation opportunities in the May Creek buffer area.

Mitigation plantings include two planting types, as indicated in Figure 2. The first planting type ("mixed vegetation") will consist of predominantly low-growing, transmission line-friendly vegetation that includes mostly small trees or shrubs with some groundcovers like sword fern (Figure 3). This planting type will be located beneath transmission lines, and outside of the pipeline easement. It may include snagged trees, hinge-felled trees, and large woody debris to improve habitat functions of the buffer area.

The second planting area ("mowable herbaceous pollinator mix") will be located in the co-located PSE/OPL easement and consist of mowable pollinator-friendly herbaceous vegetation (Figure 4). Vegetation in the pipeline easement must be compatible with pipeline corridor vegetation maintenance practices, limiting the installation of woody small trees and shrubs in this area. Establishment of mowable pollinator-friendly native plants will improve the buffer functions of the pipeline easement while allowing for regular mowing for vegetation maintenance. This vegetation type is known to provide forage for pollinators, stabilize soils, decrease the spread of invasive plants, enhance corridor aesthetics, and improve overall ecosystem health (Pollinator Health Task Force 2016). Expanding pollinator forage habitat along road rights-of-way and in utility corridors is becoming increasingly recognized as a valuable habitat improvement opportunity in these managed areas (Conniff 2014, thomses 2015).

See Final Mitigation Plan for site-specific details.

8.3 Geologic Hazard Area Mitigation

GeoEngineers has proposed mitigation strategies to minimize impacts to geologic hazard areas in the corridor in their analysis report (Appendix C). As stated previously, and in their report, with implementation of these strategies, proposed activities are not expected to impact the geologic hazard areas in the May Creek drainage and are consistent with the management activities of the existing corridor. In addition, proposed wetland and stream buffer mitigation activities in the May Creek drainage are expected to benefit the associated geologic hazard areas and further mitigate the risk of slope instability in this location.

Pole Replacement

Pole replacement activities are proposed in erosion hazard areas and in landslide and steep slope hazard area buffers. For pole replacement activities, the disturbed area will be stabilized using BMPs that reduce potential impacts including plant replacement, seeding, or hog fuel application in areas of bare soil and scattering chipped wood or tree debris. Soil removed from new pole excavations will be scattered into vegetation and away from landscaped areas. If the work area is wet or has standing water, driving mats will be used under all

equipment and all soils excavated for pole installation will be removed from the site for offsite disposal. The requirements of a Sediment and Erosion Control Plan will be addressed in the Project-specific Temporary Erosion and Sediment Control (TESC) Plan and Construction Stormwater Pollution Prevention Plan (CSWPPP). Additionally, for poles located in geological hazard areas or associated buffers, the old poles will be cut off approximately 1-2 feet below the ground surface and the remaining portion of each pole left in place.

Vegetation Management

Options for mitigation of vegetation management and tree removal in geologic hazard areas include limiting disturbance to these areas by large equipment (only by foot and hand-cutting with chainsaws), leaving cut stumps in place, and chipping or scattering tree debris where feasible.

On private property, coordination with the property owners will direct mitigation strategies to be implemented. In the May Creek drainage, when removing trees, GeoEngineers recommends trees are felled across the fall line and left perpendicular to the slope, tree debris is scattered upslope of the riparian buffer zone, and erosion control measures be implemented to reduce erosion of material from the slope into May Creek.

Temporary Work Areas

Where vegetation clearing is required to reestablish access on existing trails or old access routes, BMPs will be implemented. These BMPs may include, but are not limited to outsloping road surfaces, crowning road surfaces (where appropriate, such as at ridge tops and where roads climb gently inclined surfaces) and installing water bars or rolling dips at regularly spaced intervals to avoid concentrating surface water flow along the road surface. After construction, disturbed areas should be graded to a stable free-draining configuration, treated with appropriate erosion control measures, and seeded. Most, if not all, access routes can be abandoned following construction using erosion control measures and seeding.

9 CODE COMPLIANCE

This Critical Areas Report has been prepared to support the City's critical area review process and is intended to satisfy the requirements of the Newcastle Municipal Code (NMC), Chapter 18.24 – Critical Areas. As the Project proposes impacts to onsite critical areas, it is subject to the critical area report requirement of NMC 18.24.110. The preceding sections identify and characterize critical areas, and thoroughly evaluate the proposal and all probable impacts including an assessment of impacts of the development proposal on the identified critical

areas, and contain an assessment of the impacts of the proposed critical area alterations in accordance with the critical area report requirements of NMC 18.24.120.

As noted in Section 5, the City may approve alterations in wetland and stream buffer areas for utility corridors if certain criteria are met and impacts are appropriately mitigated. Specific code provisions applicable to this project are presented below (italicized), followed by a Project-specific description that documents compliance.

Similarly, the City may allow alterations to landslide and steep slope hazard areas for public and private utility and utility corridors if it is demonstrated that the alterations involved will not subject the critical area to an increased risk of landslide or erosion and vegetation removal is limited to the minimum necessary. In addition, certain activities are allowed on erosion hazard areas pursuant to the development standards and mitigation requirements in the NMC. Proposed alterations to erosion hazard areas, landslide hazard areas, steep slope hazard areas, and associated buffers have been evaluated by the Project's geotechnical experts, GeoEngineers. Their findings, including documentation of compliance with applicable code sections, are included as Appendix C, and are also incorporated in Sections 9.2 through 9.5 below.

Specific requirements related to compensatory mitigation activities for wetland and stream buffer impacts, maintenance and monitoring (NMC 18.24.130, 18.24.132, 18.24.140, 18.24.170, 18.24.325, 18.24.309) have been considered in the preparation of the mitigation plan and are discussed in Section 8. Specific requirements have been incorporated into the Final Mitigation Plan design and are documented in the Final Mitigation Plan notes.

9.1 NMC 18.24.320 Wetlands- Permitted Alterations

Compliance with applicable performance standards for public and private utility corridors allowed in wetland buffers is described below:

If the department determines that there is no practical alternative location with less adverse impact on the wetland or its buffer, then alterations to wetlands and buffers may be allowed pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, as follows:

A. Public and private utility corridors in wetland buffers if:

1. *The utility corridor is not located in a buffer where the buffer or associated wetland is used as a fish spawning area or by species listed as endangered or threatened by the*

state or federal government or contains critical or outstanding actual habitat for those species or heron rookeries or raptor nesting trees;

Response: Wetlands and wetland buffers in the Project area are not suitable fish spawning habitat. Endangered Species Act (ESA) documentation for the south segment of the Project which includes the South Bellevue Segment, Newcastle, and Renton, addresses federally-listed species. As summarized in that document, the proposed Project will have no effect on ESA-listed species based upon lack of documented use, lack of suitable habitat, and/or avoidance of in-water work.

Priority habitats and species were reviewed to determine potential Fish and Wildlife Habitat Conservation Areas in the Project area (Section 4.3.3). Online resources do not map any heron rookeries or raptor nests in or near the transmission line corridor, consistent with field observations. In general, existing use and maintenance of the transmission line corridor precludes the development of potential nest trees in the Project area. While raptors may utilize man-made structures (*i.e.,* utility poles) for nesting and herons could use habitat in the vicinity of the Project area for breeding, none were observed during field work activities, and none are known by PSE avian biologists to occur in the vicinity of the Project.

If heron rookeries or raptor nesting trees are observed within the Project area, PSE avian biologists will develop and implement a strategy to prevent impacts to the respective species in coordination with WDFW. PSE implements an Avian Protection Plan (the "Plan") to protect avian wildlife from harmful interactions with their utility equipment. The Plan includes preventing the creation of potentially harmful nests and monitoring known nest sites when construction activities occur in close proximity during the nesting season (Puget Sound Energy n.d.). Potential Project impacts to birds that could be expected to utilize habitat in the Project area are mitigated through PSE's bird protection programs and procedures.

2. *The construction area and resulting utility corridor are the minimum widths practical;*

Response: The Project has been through multiple design revisions and alternate routes have been considered, as documented in the Phase 2 Draft Environmental Impact Statement (ESA 2017), in order to ensure the least impact to critical areas that is reasonably feasible. Utilizing the existing transmission line corridor helps to minimize corridor and construction area widths and resulting impacts associated with the Project as the corridor has experienced significant disturbance as a result of adjacent development and ongoing corridor maintenance. PSE does not propose expanding the width of the existing utility corridor. Pole construction work areas will be adjusted to avoid critical areas on a pole by pole basis. When it is unavoidable to work within a critical area the construction disturbance will be limited to the minimum feasible size around

each pole and access point. Access has been sited to use existing routes to the extent feasible. Furthermore, use of the existing corridor and locating the new poles generally close to the existing poles allows for the use of existing access points in many instances.

3. *Except as provided in subsection (G) of this section, the utility corridor is located within the outer 25 percent of the buffer or within a roadway, the improved area of an existing utility corridor or the improved area of an approved trail;*

Response: The Project is located within the improved area of an existing utility corridor which was originally constructed in the 1920s and 1930s. Vegetation management has been ongoing in the corridor for years, in association with the current poles and wires. Furthermore, a portion of the transmission line corridor is also used as a petroleum pipeline corridor. In general, vegetation management requirements of pipelines are more restrictive than the vegetation management requirements for transmission lines. For example, trees and shrubs are expected to be mowed or removed on a more regular basis than for the transmission lines to prevent damage to the pipelines by large roots. In addition, a corridor of herbaceous vegetation may be maintained both to keep the area free of large tree and shrub roots and to be able to easily, visually inspect the pipeline corridor from the ground and/or air.

4. *The wetland and its buffer are protected during utility corridor construction and maintenance;*

Response: No direct wetland impacts are proposed. BMPs will be used to protect the wetlands and minimize buffer impacts during construction and ongoing maintenance activities. During work within buffers, mats will be placed over existing vegetation where possible. Typically, crushed vegetation rebounds within one growing season resulting in only temporary impacts to vegetation. Post-construction, all disturbed areas will be re-vegetated, if necessary, and left to return to their natural state.

5. *The utility corridor is aligned to avoid cutting significant trees, to the maximum extent practical;*

Response: Every effort has been made to relocate poles out of wetlands and wetland buffers to avoid removal of vegetation, including significant trees (defined as an existing healthy tree measuring eight inches diameter at four feet above grade for conifers and twelve inches for deciduous trees per NMC 18.06.598), within those areas. Direct impacts to wetlands are completely avoided, but some buffer impact, including tree removal, is unavoidable with Project development. Some pole locations and pole replacement activities associated with the transmission line upgrade must occur in specific locations for proper functioning of the electrical system due to complex engineering considerations. Where avoidance wasn't possible, PSE worked with engineers to

minimize impacts. Tree removal is dictated by the wire height and vegetation management requirements around the poles. Consistent with federal standards, vegetation in the wire zone must have a mature height of no greater than 15 feet, unless the topographic change is sufficient to allow a 20-foot vertical clearance between the power lines and the mature height of trees under the power lines. The same vegetation requirement was applied to the managed ROW zone. The area outside of the managed ROW, but still within the legal ROW, is also subject to select clearing of trees that pose a risk of damaging the lines. To facilitate the tree removal numbers captured in the impact analysis presented in this report a maximum mature tree height of 70 feet was presumed in the maintained legal ROW. However, existing trees greater than 70 feet, or with a mature height of greater than 70 feet will not necessarily be removed.

6. *Vegetation removal is limited to the minimum necessary to construct the corridor;*

Response: The Project has been through multiple design revisions and has considered alternate routes in order to ensure the least impact to critical areas that is reasonably feasible. Vegetation in the existing corridor is already routinely managed. The corridor was initially disturbed during the original construction and has regular and ongoing disturbance due to transmission line and pipeline maintenance and pole replacement activities. With the exception of May Creek Park, the majority of trees in the existing corridor are ornamental and associated with existing property uses. Permanent critical area impacts associated with the Project are limited to areas where a vegetated critical area will be converted to a transmission line pole. This vegetation removal is the minimum necessary to allow for placement of the new poles. The new poles have all been located outside of wetlands and all direct vegetation removal from wetlands has been avoided. Vegetation removal from wetland buffers is limited to the removal of two domestic apple trees resulting in 280 square feet of vegetation community conversion and 3,950 square feet of temporary disturbance which will be restored in-place after construction work is complete. Additionally, a net area of 10 square feet of fill (from existing poles) will be removed with pole replacement activities.

7. *Vegetation removal for the purpose of corridor maintenance is the minimum necessary to maintain the utility's function;*

Response: Vegetation in the existing corridor is already routinely managed in accordance with federal and PSE guidelines. The proposed route, and associated area surrounding the new poles, will also experience routine vegetation management. The majority of vegetation removal proposed for this Project is associated with vegetation conversion impacts which are caused by vegetation management activities resulting in the removal of incompatible transmission line vegetation and a shift from forested to shrubby or herbaceous vegetation communities. As noted above, the majority of the wetland buffer impacts are

temporary disturbance. Conversion impacts are limited to the removal of two apple trees.

All vegetation in the wire zone and managed ROW portions of the transmission line corridor, when mature, will be fifteen feet or less (unless topography allows for at least a 20-foot clearance between vegetation and the lines). During typical inspections and maintenance of the poles vegetation is routinely disturbed. As such, no trees of any size will grow within close proximity (about 6 feet) of the new poles. Where pole construction work areas and pole buffer areas do not require the removal of trees, the resulting impacts will be temporary. The majority of pole construction work area and pole buffer impacts are expected to be temporary due to the existing use and management of the corridor (*i.e.*, lack of trees) and consideration that existing groundcover will be restored or regenerate on its own within one growing season. After construction, the temporarily disturbed areas will be re-vegetated and left to return their natural state or enhanced.

8. *Any corridor access for maintenance is at specific points into the buffer rather than by a parallel road, to the maximum extent practical;*

Response: Access for maintenance of poles in critical areas will generally occur using existing, partially vegetated access established during original construction. BMPs will be used to minimize ground disturbance in these areas and in new areas of access. Based on the existing conditions, proposed construction BMPs, and post-construction methods, disturbance associated with access in the transmission corridor will be predominantly temporary. Only two access routes are required though wetland buffers. One access area is limited to the end of a route where it must extend into the buffer to access two new poles located in the buffer. The second access route is required to go through a wetland buffer edge to provide access from SE 95th Way to two new poles proposed north of the wetland.

9. *If the department determines that a parallel maintenance road is necessary, the following conditions shall be complied with:*
   a. *The width of the roadway shall be as small as possible and not greater than 15 feet; and*
   b. *The location of the roadway shall be contiguous to the utility corridor on the side farthest from the wetland;*

Response: No parallel maintenance roads are proposed.

9.2 NMC 18.24.308 Streams- Permitted Alterations

Compliance with applicable performance standards for public and private utility corridors allowed in stream buffers is described below:

If the department determines that there is no practical alternative location with less adverse impact on the stream or its buffer, then alterations to streams and buffers may be allowed pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, as follows:

A. Public and private utility corridors in stream buffers if:

1. *The utility corridor is not located in a buffer where the buffer or associated stream is used by species listed as endangered or threatened by the state or federal government or contains critical or outstanding actual habitat for those species or heron rookeries or raptor nesting trees;*

Response: Endangered Species Act (ESA) documentation for the south segment of the Project which includes the South Bellevue Segment, Newcastle, and Renton, addresses federally-listed species. As summarized in that document, the proposed Project will have no effect on ESA-listed species based upon lack of documented use, lack of suitable habitat, and/or avoidance of in-water work. WDFW Salmonscape mapping indicates Chinook salmon, an ESA-listed threatened species, are documented spawning in May Creek. The Project area occurs approximately one-half mile from the upper extent of documented Chinook presence in May Creek (WDFW 2017). As the Project proposes to use the existing corridor, which crosses May Creek, it is unavoidable that the Project area includes some May Creek buffer area. To completely avoid the buffer of the reach of May Creek associated with mapped Chinook spawning, the existing corridor could not be used and a new corridor would need to be established to the east, outside of Newcastle city boundaries where no spawning is documented. Re-location of existing infrastructure and creation of new infrastructure would be required and new critical area impacts would likely be incurred.

No in-water work is proposed in May Creek and no poles, stringing sites, or access routes are proposed in the buffer. Buffer impacts are limited to vegetation management activities which will remove vegetation incompatible with the transmission lines through that area. Vegetation management already occurs in the May Creek buffer to accommodate the current lines in the corridor. A pipeline easement is also present within the existing utility corridor. In general, the pipelines are actively maintained in a mowed condition whereas the vegetation management proposed in the buffer of May Creek for the transmission lines would allow vegetation up to 15 feet tall, or taller, depending on the exact location relevant to the wire zone, and ROW. Mitigation is proposed in the May Creek riparian area which will provide an improvement in overall stream and buffer function.

Priority habitats and species were reviewed to determine potential Fish and Wildlife Habitat Conservation Areas in the Project area (Section 4.3.3). Online resources do not map any heron rookeries or raptor nests in or near the

transmission line corridor, consistent with field observations. In general, existing use and maintenance of the transmission line corridor precludes the development of potential nest trees in the Project area. While raptors may utilize man-made structures (*i.e.*, utility poles) for nesting and herons could use habitat in the vicinity of the Project area for breeding, none were observed during field work activities, and none are known by PSE avian biologists to occur in the vicinity of the Project.

If heron rookeries or raptor nesting trees are observed within the Project area, PSE avian biologists will develop and implement a strategy to prevent impacts to the respective species in coordination with WDFW. PSE implements its Avian Protection Plan to protect avian wildlife from harmful interactions with their utility equipment, which includes preventing the creation of potentially harmful nests and monitoring known nest sites when construction activities occur in close proximity during the nesting season (Puget Sound Energy n.d.). Potential Project impacts to birds that could be expected to utilize habitat in the Project area are mitigated through the PSE's bird protection programs and procedures.

2. *The construction area and resulting utility corridor are the minimum widths practical;*

Response: Utilizing the existing transmission line corridor helps to minimize corridor and construction area widths and resulting impacts associated with the Project, as the corridor has experienced significant disturbance as a result of adjacent development and ongoing corridor maintenance. PSE does not propose expanding the width of the existing utility corridor. Pole construction work areas will be adjusted to avoid critical areas on a pole by pole basis. When it is unavoidable to work within a critical area the construction disturbance will be limited to the minimum feasible size around each pole and access point. Access has been sited to use existing routes to the extent feasible. Furthermore, use of the existing corridor and locating the new poles generally close to the existing poles allows use of existing access points in many instances.

3. *Except as provided in subsection (E) of this section, the utility corridor is located within the outer 25 percent of the buffer or within a roadway, the improved area of an existing utility corridor or the improved area of an approved trail;*

Response: The Project is located within the improved area of an existing utility corridor which was originally constructed in the 1920s and 1930s. Vegetation management has been ongoing in the corridor for years in association with the current poles and wires. Furthermore, a portion of the transmission line corridor is also used as a petroleum pipeline corridor. In general, vegetation management requirements of pipelines are more restrictive than the vegetation management requirements for transmission lines. For example, trees and shrubs are expected to be mowed or removed on a more regular basis than for the transmission lines to prevent damage to the pipelines by large roots. In addition, a corridor of

herbaceous vegetation may be maintained both to keep the area free of large tree and shrub roots and to be able to easily, visually inspect the pipeline corridor from the ground and/or air.

4. *The stream and its buffer are protected during utility corridor construction and maintenance;*

Response: No direct stream impacts are proposed. BMPs will be used to protect streams and minimize buffer impacts during construction and ongoing maintenance activities. During work within buffers, mats will be placed over existing vegetation where possible. Typically, crushed vegetation rebounds within one growing season resulting in only temporary impacts to vegetation. Post-construction, all disturbed areas will be re-vegetated, if necessary, and left to return to their natural state.

5. *The utility corridor is aligned to avoid cutting significant trees, to the maximum extent practical;*

Response: Every effort has been made to relocate poles out of critical areas and buffers to avoid removal of vegetation, including significant trees, within those areas. Following these efforts, PSE proposes the removal 18 live trees in stream buffers, none of which are considered significant by Newcastle as defined in NMC 18.06.598. While direct impacts to streams are completely avoided, some buffer impact, including tree removal, is unavoidable with Project development. Some pole locations and pole replacement activities associated with the transmission line upgrade must occur in specific locations for proper functioning of the electrical system due to complex engineering considerations. Where avoidance wasn't possible, PSE worked with engineers to minimize impacts. Tree removal is dictated by the wire height and vegetation management requirements around the poles. Consistent with federal standards, vegetation in the wire zone must have a mature height of no greater than 15 feet, unless the topographic change is sufficient to allow a 20-foot vertical clearance between the power lines and the mature height of trees under the power lines. The same vegetation requirement was applied to the managed ROW zone. The area outside of the managed ROW, but still within the legal ROW, is also subject to select clearing of trees that pose a risk of damaging the lines. To facilitate the tree removal numbers captured in the impact analysis presented in this report, a maximum mature tree height of 70 feet was presumed in the maintained legal ROW. However, existing trees greater than 70 feet, or with a mature height of greater than 70 feet will not necessarily be removed.

6. *Vegetation removal is limited to the minimum necessary to construct the corridor;*

Response: The Project has been through multiple design revisions and has considered alternate routes in order to ensure the least impact to critical areas that is reasonably feasible. Vegetation in the existing corridor is already routinely

managed. The corridor was initially disturbed during the original construction of the route and has regular and ongoing disturbance due to maintenance and pole replacement activities. With the exception of May Creek Park, the majority of trees in the existing corridor are ornamental and associated with existing property uses. Permanent critical area impacts associated with the Project are limited to areas where a vegetated critical area will be converted to a transmission line pole. No new poles are proposed in stream buffers. Vegetation removal from stream buffers totals 2,579 square feet of vegetation community conversion mainly occurring in the May Creek buffer; and 31 square feet of temporary disturbance to the buffer area of Stream MN01, which will be restored in place after construction work is complete.

7. *Vegetation removal for the purpose of corridor maintenance is the minimum necessary to maintain the utility's function;*

Response: Vegetation in the existing corridor is already routinely managed in accordance with federal and PSE guidelines. The transmission line corridor, and associated area surrounding the new poles, will also experience routine vegetation management. The majority of vegetation removal proposed for this Project is associated with vegetation conversion impacts which are caused by vegetation management activities resulting in the removal of incompatible transmission line vegetation and a shift from forested to shrubby or herbaceous vegetation communities. As noted above all stream buffer vegetation conversion impacts are located in the buffer of May Creek due to vegetation management in legal ROW, managed ROW, and wire zone.

All vegetation in the transmission line corridor, when mature, will be fifteen feet or less. During typical inspections and maintenance of the poles vegetation is routinely disturbed; as such, no trees of any size will grow within close proximity (about 6 feet) of the new poles. Where pole construction work areas and pole buffer areas do not require the removal of trees, the resulting impacts will be temporary. The majority of pole construction work area and pole buffer impacts are expected to be temporary due to the existing use and management of the corridor (*i.e.*, lack of trees) and consideration that existing groundcover will be restored or regenerate on its own within one growing season. After construction, the temporarily disturbed areas will be re-vegetated and left to return their natural state or enhanced.

8. *Any corridor access for maintenance is at specific points into the buffer rather than by a parallel road, to the maximum extent practical;*

Response: Proposed access routes completely avoid stream buffers in the Project area.

9. *If the department determines that a parallel maintenance road is necessary, the following conditions shall be complied with:*

   c. *The width of the roadway shall be as small as possible and not greater than 15 feet; and*

   d. *The location of the roadway shall be contiguous to the utility corridor on the side farthest from the stream;*

Response: No parallel maintenance roads are proposed.

9.3 NMC 18.24.305 Fish and wildlife habitat conservation areas – Development standards

Compliance with applicable performance standards for fish and wildlife habitat conservation areas is described below:

B. General Requirements.

1. *A fish and wildlife habitat conservation area and associated buffer may be altered only if the proposed alteration of the habitat and associated buffer does not degrade the function of the habitat and associated buffer.*

Response: According to WDFW's online databases (PHS on the Web and SalmonScape) salmonid species known to occur in May Creek are cutthroat trout, sockeye salmon, Chinook salmon, steelhead, and coho salmon, thereby establishing May Creek as a Fish and Wildlife Habitat Conservation Area (FWHCA). Streams MB01 and MN01, as Waters of the State, are also FWHCAs. Vegetation conversion impacts are proposed to the buffer of May Creek and MB01, including removal of 18 native, deciduous trees and one small landscape tree, respectively. Removal of these trees is expected to impact the functions of the May Creek buffer (which overlaps mapped landslide hazard areas, steep slopes and/or associated slope buffers). The critical area regulations for streams are expected to adequately protect the May Creek FHWCA for the duration of the Project. Mitigation is proposed that complies with the City's stream buffer alteration provisions and will ensure the Project results in no net loss of critical area function, including habitat. See Section 7.2 for a discussion of proposed functional lift post Project implementation.

2. *Whenever activities are proposed in or adjacent to a habitat conservation area or associated buffer, such area shall be protected through the application of measures in accordance with a critical area report prepared by a qualified professional and approved by the city of Newcastle, and guidance provided by the appropriate state or federal agencies.*

Response: This report documents the impacts and mitigation proposed and is a complement to the Final Mitigation Plan which depicts proposed mitigation areas, design, maintenance and monitoring provisions.

4. *Mitigation of alterations to habitat conservation areas shall achieve equivalent or greater biological functions. Mitigation shall address each function affected by the alteration to achieve functional equivalency or improvement on a per function basis. Mitigation shall be detailed in a fish and wildlife habitat conservation area mitigation plan, which may include the following as necessary:*

    a. A native vegetation plan;

    b. Plans for retention, enhancement or restoration of specific habitat features;

    c. Plans for control of nonnative invasive plant or wildlife species; and

    d. Stipulations for use of innovative, sustainable building practices.

Response: Sections 8 and 7.2 of this report describe the mitigation approach and how the proposal will be designed to improve overall critical area function and ensure that no net loss of critical area functions is achieved. Mitigation is proposed in the May Creek buffer. The May Creek buffer site provides enough opportunity and area to mitigate for all wetland/stream buffer impacts that occur in the Newcastle Project area. As demonstrated in Section 7.2, the May Creek buffer is a suitable location for achieving an overall functional lift with respect to water quality, hydrologic, and habitat critical area functions. It also provides the opportunity to improve landslide hazard area, steep slope hazard area and/or associated buffers, and FWHCAs while mitigating for wetland and stream buffer impacts.

9.4 NMC 18.24.210 Erosion Hazard Areas- Development Standards

Compliance with applicable performance standards for geologic hazard areas has been described by the Project's geotechnical experts. The complete geologic hazard evaluation is included in Appendix C.

Development proposals and other alterations on sites containing erosion hazard areas shall be allowed, pursuant to applicable permits or approvals, only if they or any other alteration complies with all applicable requirements set forth in this chapter including, but not limited to, mitigation requirements and the following standards:

A. *Clearing in an erosion hazard area shall be allowed only from May 1 to September 30, except that timber harvest may be allowed pursuant to an approved forest practice permit issued by the Washington Department of Natural Resources.*

Response: Site activities including vegetation management (which includes tree removal and tree trimming) as well as vegetation clearing (which includes mowing and cutting of limbs or brush such as blackberries) will be completed between May 1 and September 30.

B. *All subdivisions, short subdivisions, binding site plans, site plan review and planned unit developments on sites with erosion hazard areas shall retain existing vegetation in all*

erosion hazard areas until a building permit is approved for development on the lots, except that:

1. *Vegetation may be removed as necessary for construction of related infrastructure;*
2. *Noxious weeds may be removed; and*
3. *Timber may be harvested as allowed in subsection (A) of this section.*

Response: No subdivision or unit developments on sites are proposed relative to the proposed vegetation management activities (the primary activity in the May Creek Drainage) or the vegetation management, pole installation, or construction access located in the remainder of the corridor (erosion hazard area) within mapped geologic hazard areas and buffers. Trees removed are not proposed for timber harvest and typically will be left on site as described above unless agreed otherwise with individual property owners. Per WAC Title 222 and RCW Ch. 76.09, a Forest Practice Application to Washington Department of Natural Resources for limited tree removal and trimming will not be required.

9.5 NMC 18.24.215 Erosion Hazard Areas- Specific Mitigation Requirements

In addition to general mitigation requirements contained in NMC 18.24.170, the following shall apply to mitigation of adverse impacts associated with erosion hazard areas:

A. *For any development proposal on a site containing an erosion hazard area, an erosion and sediment control plan shall be required and included as part of the mitigation plan. The erosion and sediment control plan shall be prepared in compliance with requirements set forth in the erosion and sediment control standards and the Surface Water Design Manual.*

Response: The proposed development includes vegetation management, pole installation, and construction access that will include mitigation measures to reduce potential impacts to geologic hazards that include erosion hazard areas, landslide hazard areas and steep slope hazard areas, and their associated buffers. Mitigation measures include a variety of BMPs to reduce potential impacts to geologic hazards in the vicinity of neighboring properties. BMPs include, but are not limited to: plant replacement, scattering trimmed or removing tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. The requirements of a Sediment and Erosion Control Plan will be addressed in the project-specific Temporary Erosion and Sediment Control (TESC) Plan and Construction Stormwater Pollution Prevention Plan (CSWPPP).

B. *Damage to or removal of vegetation on lots in a subdivision, short subdivision or binding site plan during construction of related infrastructure shall be mitigated by stabilizing the lots in compliance with the provisions of the erosion and sediment control standards.*

Response: No subdivisions, short subdivisions, or binding site plan properties are located within the May Creek drainage (primarily open space associated with the surrounding riparian area), which is the only location in the existing utility corridor where tree removal and trimming activities associated with right-of-way vegetation management will result in disturbances to steep slope buffer and landslide hazard buffer areas. No poles will be replaced, nor will any access routes be re-established, in the designated steep slope and landslide hazard areas of the May Creek drainage.

Erosion hazard areas are mapped north of the May Creek drainage area in the existing utility corridor, crossing through multiple subdivisions. Right-of-way vegetation management, pole replacement, and construction access activities throughout the mapped erosion hazard area will require disturbance of portions of the residential lots located in these subdivisions. During and after construction, the disturbed areas will be stabilized using the BMPs that reduce potential impacts to erosion and other geologic hazards. BMPs include, but are not limited to: plant replacement, scattering trimmed or removing tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. The requirements of a Sediment and Erosion Control Plan will be addressed in the project-specific TESC Plan and CSWPPP.

C. *If a city determines that erosion from a development proposal site poses a significant risk of damage to downstream receiving waters based on the size of the project, the proximity to the receiving waters or the sensitivity of the receiving waters, the applicant shall monitor the surface water discharge from the site and submit monitoring reports as set forth in an approved mitigation plan. If the project does not meet appropriate water quality standards established by law or administrative rules, the city may suspend further development work on the site until such standards are met.*

Response: The proposed vegetation management, pole installation, and construction access activities will use mitigation measures to include BMPs to reduce potential of damage to downstream receiving waters. Mitigation measures include, but are not limited to: plant replacement, scattering trimmed or removed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate.

9.6 NMC 18.24.270 Landslide hazard areas – Development standards and permitted alterations

A. *Development proposals and other alterations on sites containing landslide hazard areas or buffers shall comply with all applicable requirements set forth in this chapter, including, but not limited to, mitigation requirements and the following standards:*

1. *A buffer shall be established from all edges of the landslide hazard area. The size of the buffer shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from landslides caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet.*
2. *Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a landslide hazard area or buffer shall be prohibited.*
3. *All alterations shall be undertaken in a manner to minimize disturbance to the landslide hazard area, slope and vegetation unless necessary for slope stabilization.*

Response: PSE's existing public utility corridor, which is routinely maintained, crosses the wooded May Creek drainage. This drainage is mapped as a landslide hazard. The proposed removal and retention of trees in the May Creek drainage for vegetation management is consistent with the management activities of the existing power line right-of-way and is not anticipated to impact the mapped landslide hazard areas within this drainage area, provided that removal of vegetation and trees is completed by hand and/or using limited access machinery to reduce potential impacts to landslide hazard areas. Three trees (Douglas firs, ranging in diameter-breast-height from 4.2 to 5.3 inches) will be removed and two pole replacement activities will occur in the landslide hazard buffer zone. Possible mitigation measures include a variety of BMPs to reduce potential impacts to landslide hazard areas, including plant replacement (where located near existing residential properties), scattering trimmed or removed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate.

B. *Alterations to landslide hazard areas and buffers may be allowed, pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, only as follows:*

1. *Surface water conveyances if the department finds that:*
    a. *Discharging the surface water at the base of the landslide hazard area has less adverse impact upon the critical area than if the surface water were dispersed at the top of the landslide hazard area; and*

b. Adverse impacts to fish are minimized, to the maximum extent possible, by maintaining the prealteration groundwater volume to support fish habitat in receiving water bodies.

2. Public and private utilities and utility corridors if the applicant shows that:

a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

b. Vegetation removal is limited to the minimum necessary to locate the utility or construct the corridor.

3. Normal and routine maintenance of existing public and private utility facilities and utility corridors if the applicant shows that:

a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

b. Vegetation removal for the purpose of utility and corridor maintenance is the minimum necessary to maintain the utility's function.

4. Vegetation removal activities, as follows:

a. The removal of noxious weeds

b. The removal of vegetation, only as necessary for surveying purposes

c. The removal of hazard trees, as determined by the department

5. Stabilization of sites where erosion or landsliding threatens public or private structures, utilities, roadways, driveways or publicly maintained trails or where erosion or landsliding threatens any lake, stream, wetland or shoreline. Stabilization work shall be performed in a manner which causes the least possible disturbance to the slope and its vegetative cover.

6. Exploratory drilling and testing, involving only necessary and limited clearing and grading, for the purpose of preparing critical area reports.

7. The application of herbicides or other hazardous substances, if necessary, as approved by the department.

8. Any alterations in a landslide hazard area located in an area that does not meet the criteria as a steep slope as defined under NMC 18.06.628 only if:

a. The development proposal will not decrease slope stability on contiguous properties; and

b. Mitigation based on the best available engineering and geological practices is implemented which either eliminates or minimizes the risk of property damage, death or injury resulting from landsliding.

Response: The proposed development includes limited vegetation management, tree removal and tree trimming for the purpose of maintain the existing utility right-of-way within mapped landslide hazard areas. Tree removal and trimming in the mapped landslide hazard area will be associated with vegetation management in the wire zone and limited to selective tree removal and trimming

necessary to provide system reliability and meet the federal requirements. Tree removal and trimming will be followed by mitigation measures to reduce potential impacts to landslide hazard areas. Mitigation measures include a variety of BMPs to reduce potential impacts to landslide hazard areas and slope stability on contiguous properties. BMPs include minimum removal necessary to maintain utility's function, tree/vegetation replacement, scattering trimmed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. In our opinion, the proposed vegetation management will not decrease slope stability on contiguous properties; and mitigation based on the best available engineering and geological practices will be implemented to either eliminate or minimize the risk of property damage, death or injury resulting from landsliding.

9.7 NMC 18.24.300 Steep slope hazard areas – Development standards and permitted alterations

A. *Development proposals and other alterations on sites containing steep slope hazard areas or buffers shall comply with all applicable requirements set forth in this chapter including, but not limited to, mitigation requirements and the following standards:*

1. *A buffer shall be established from all edges of the steep slope hazard area. The size of the buffer or setback shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from slope instability, landsliding or erosion caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. In no instance shall the minimum buffer be less than 10 feet. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet;*
2. *Buffers for steep slope hazard areas shall not be subject to provisions for buffer averaging; and*
3. *Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a steep slope hazard area or buffer shall be prohibited.*

Response: For this review, steep slope hazard areas were assigned a 50-foot-wide buffer. No pole replacement activities will occur in the steep slope hazard areas mapped within the existing utility corridor. A single pole is proposed to be installed within a steep slope hazard area buffer south of May Creek. The proposed project includes limited vegetation management, tree removal and tree trimming, within steep slope hazard area buffers (which is an allowed alteration for public utility corridors with the approval of permits). Even with the proposed vegetation management, the existing utility corridor still provides a substantial tree cover when compared to the mowed pipeline right-of-way that, based on our observations, has not impacted steep slope hazard areas or buffers. Mitigation measures will be used to reduce potential impacts to steep slope hazard area buffers.

B. Alterations to steep slope hazard areas and buffers may be allowed pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, only as follows:

1. Surface water conveyances if the department finds that:

a. The conveyance is installed in a manner to minimize disturbance to the slope and vegetation;

b. Discharging the surface water at the base of the steep slope hazard area has less adverse impact upon the critical area than if the surface water were dispersed at the top of the slope; and

c. Adverse impacts to fish are minimized, to the maximum extent possible, by maintaining the prealteration groundwater volume to support fish habitat in receiving water bodies.

2. Public and private trails as long as no trails are constructed of impervious surfaces which will contribute to surface water runoff, unless such construction is necessary for soil stabilization or soil erosion prevention or unless the trail system is specifically designed and intended to be accessible to handicapped persons. Trail construction shall be in compliance with adopted trail standards.

3. Public and private utilities and utility corridors if the applicant shows that:

a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

b. Vegetation removal is limited to the minimum necessary to locate the utility or construct the corridor.

4. Normal and routine maintenance of existing public and private utility facilities and utility corridors if the applicant shows that:

a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

b. Vegetation removal for the purpose of utility and corridor maintenance is the minimum necessary to maintain the utility's function.

5. Vegetation removal activities, as follows:

a. The removal of noxious weeds;

b. The removal of vegetation, only as necessary for surveying purposes; and

c. The removal of hazard trees, as determined by the city.

6. Stabilization of sites where erosion or landsliding threatens preexisting public or private structures, utilities, roadways, driveways or trails or where erosion or landsliding threatens any lake, stream, wetland or shoreline. Stabilization work shall be performed in a manner which causes the least possible disturbance to the slope and its vegetative cover.

7. Point discharges from surface water facilities onto or upstream from steep slope hazard areas that are also erosion hazard areas shall be prohibited except as follows:

a. *Conveyed via continuous storm pipe downslope to a point where there are no erosion hazard areas downstream from the discharge;*

b. *Discharged at flow durations matching predeveloped conditions, with adequate energy dissipation, into existing channels that previously conveyed stormwater runoff in the predeveloped state; and*

c. *Dispersed discharge upslope of the steep slope onto a low-gradient undisturbed buffer demonstrated to be adequate to infiltrate all surface and stormwater runoff.*

8. *Exploratory drilling and testing, involving only necessary and limited clearing and grading, for the purpose of preparing critical area reports.*

9. *The application of herbicides or other hazardous substances, if necessary, as approved by the department.*

Response: The proposed development includes vegetation management (tree removal and trimming), pole installation, and construction access within an existing utility right-of-way. However, none of these activities will occur within the mapped steep slope hazard areas. As such, no alterations to steep slopes are proposed. One pole is proposed to be placed in a steep slope buffer south of May Creek. In our opinion, the proposed alterations to steep slope hazard buffers will not subject the critical area to an increased risk of landslide or erosion, and vegetation removal is limited to the minimum necessary to maintain the utility corridor. Tree removal and trimming will be followed by mitigation measures to reduce potential impacts to slope stability in steep slope areas and steep slope buffer zones. Mitigation measures include a variety of BMPs to reduce potential impacts steep slope areas and slope stability on contiguous properties. BMPs include, but are not limited to: minimum removal necessary to maintain utility corridor's function, tree/vegetation replacement, scattering trimmed or removed tree debris, chipping wood to reduce potential impacts to work areas as appropriate, reseeding, and mulching disturbed areas.

10 DISCLAIMER

The information contained in this report is based on the application of technical guidelines currently accepted as the best available science. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, state and federal regulatory authorities. No other warranty, expressed or implied, is made.

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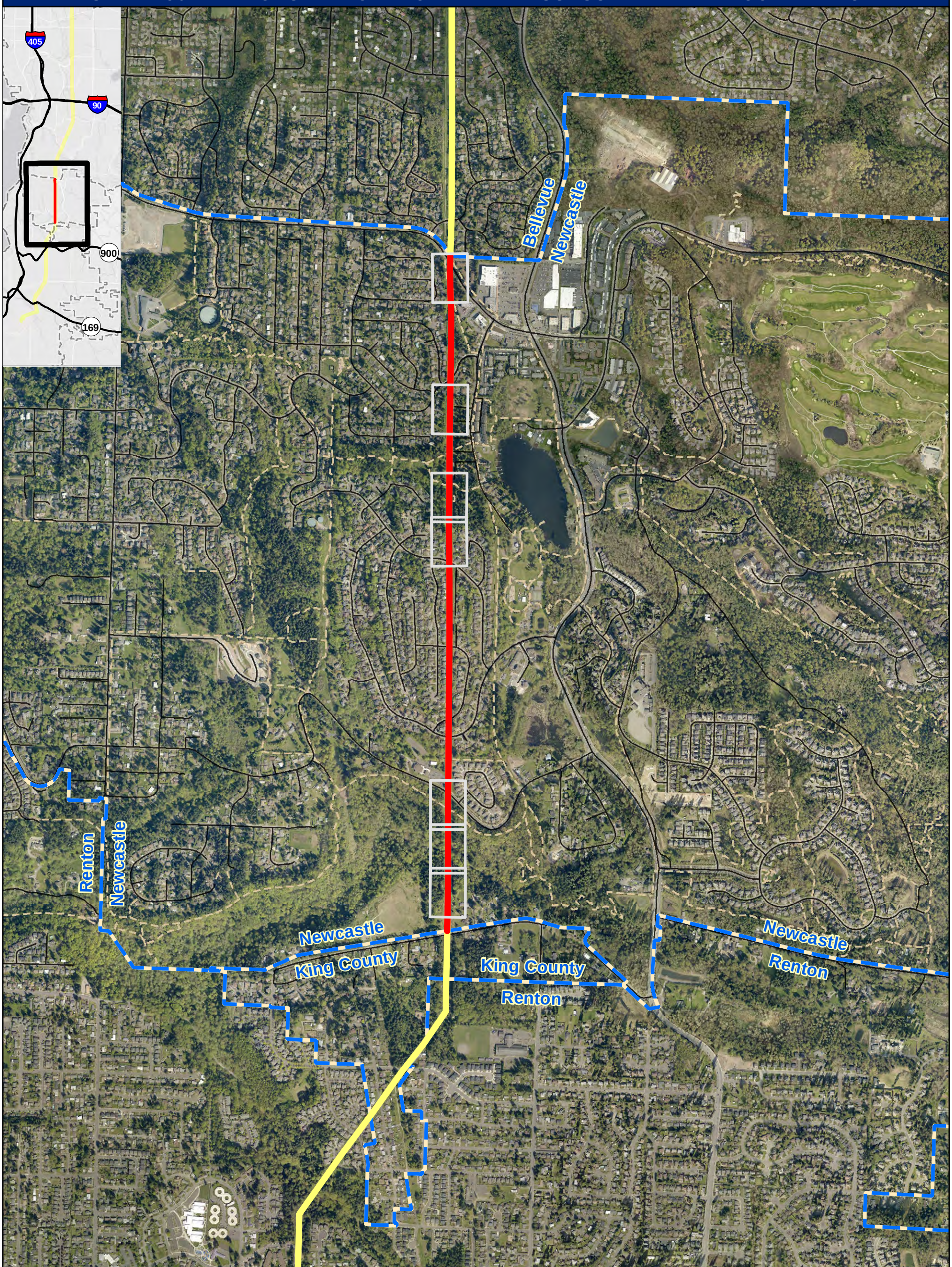
APPENDIX A

Critical Area Assessment Maps

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP - COVER PAGE



Report Map Page Extents[2 TWC]

Newcastle Segment of PSE Route [1 PSE, TWC]

PSE Route outside of Newcastle Segment[PSE]

Trails[CON]

Road Centerlines[COB]

City Limit[KC]

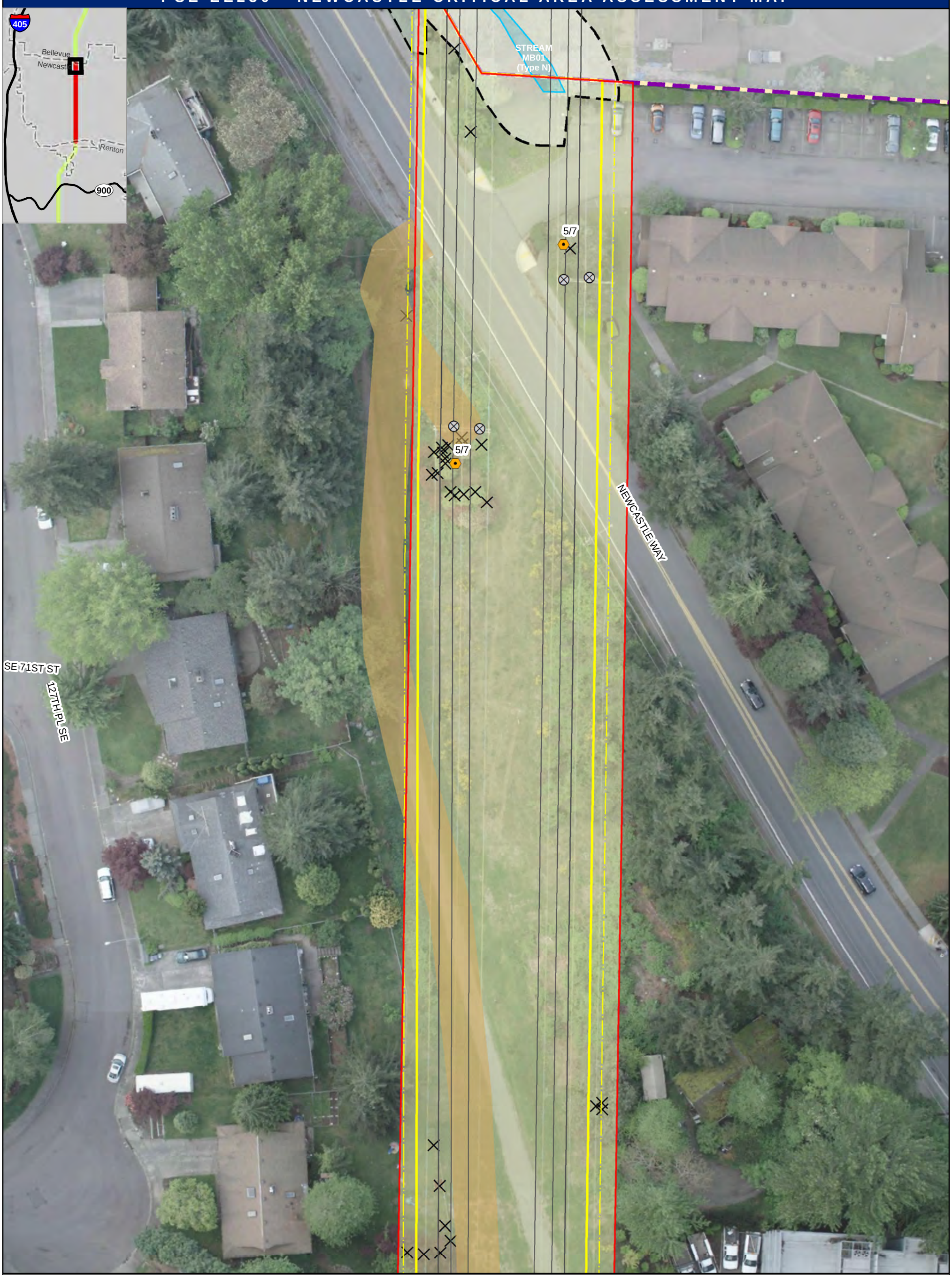
Notes:
1. Critical areas were defined within a 100' corridor along the existing powerline corridor.
2. Map pages highlighted are where critical areas, as designated in Newcastle Municipal Code Chapter 18.24, are mapped within the Newcastle corridor (excluding erosion hazard areas). All other map pages were omitted.

N

0 500 1,000
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP



Critical Area Study Limits[1 TWC]
City Limit[KC]
Wires [PSE]
Wire Zone[PSE]
Managed Right-of-Way [PSE]
Maintained Legal ROW [PSE]
-pale yellow shading

Proposed Stringing Sites[HDR]
Existing Poles to be Removed [PSE]
Proposed Pole Footprints[PSE]
Proposed Access Routes[3 PSE]
Trees to Remove[TWC]

Delineated Stream Boundary [TWC]
Delineated Wetland Boundary[TWC]
Limit of Combined Functioning Wetland/Stream Buffer[2 TWC]

Stream[TWC]
Wetland[TWC]
Combined Functioning Wetland/Stream Buffer Area[2] [TWC] *- white shading*

Steep Slope Hazard Area[4] [TWC]
Limit of Steep Slope Hazard Area Buffer[4 TWC]
Landslide Hazard Area[KC]
Landslide Hazard Area Buffer [TWC]

Notes:
1. Critical areas were defined within a 100' corridor along the existing transmission line corridor.
2. Shapes representing functioning buffers are truncated 25 feet outside of the study limits.
3. Access routes shown at typical width of 20 feet.
4. Evaluated in the field by geotechnical consultant. Please refer to Geotech report and addendum.

1

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0 20 40
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP

Critical Area Study Limits[1] TWC
City Limit[KC]
Wires [PSE]
Wire Zone[PSE]
Managed Right-of-Way [PSE]
Maintained Legal ROW [PSE]
-pale yellow shading

Proposed Stringing Sites[HDR]
Existing Poles to be Removed [PSE]
Proposed Pole Footprints[PSE]
Proposed Access Routes[3] [PSE]
Trees to Remove[TWC]

Delineated Stream Boundary [TWC]
Delineated Wetland Boundary[TWC]
Limit of Combined Functioning Wetland/Stream Buffer[2] [TWC]

Stream[TWC]
Wetland[TWC]
Combined Functioning Wetland/Stream Buffer Area[2] [TWC] *- white shading*

Steep Slope Hazard Area[4] [TWC]
Limit of Steep Slope Hazard Area Buffer[4] [TWC]
Landslide Hazard Area[KC]
Landslide Hazard Area Buffer [TWC]

Notes:
1. Critical areas were defined within a 100' corridor along the existing transmission line corridor.
2. Shapes representing functioning buffers are truncated 25 feet outside of the study limits.
3. Access routes shown at typical width of 20 feet.
4. Evaluated in the field by geotechnical consultant. Please refer to Geotech report and addendum.

2

N

0 20 40
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP

Critical Area Study Limits[1] TWC
City Limit KC
Wires PSE
Wire Zone PSE
Managed Right-of-Way PSE
Maintained Legal ROW PSE
-pale yellow shading

Proposed Stringing Sites HDR
Existing Poles to be Removed PSE
Proposed Pole Footprints PSE
Proposed Access Routes[3] PSE
Trees to Remove TWC

Delineated Stream Boundary TWC
Delineated Wetland Boundary TWC
Limit of Combined Functioning Wetland/Stream Buffer[2] TWC

Stream TWC
Wetland TWC
Combined Functioning Wetland/Stream Buffer Area[2] TWC *- white shading*

Steep Slope Hazard Area[4] TWC
Limit of Steep Slope Hazard Area Buffer[4] TWC
Landslide Hazard Area KC
Landslide Hazard Area Buffer TWC

Notes:
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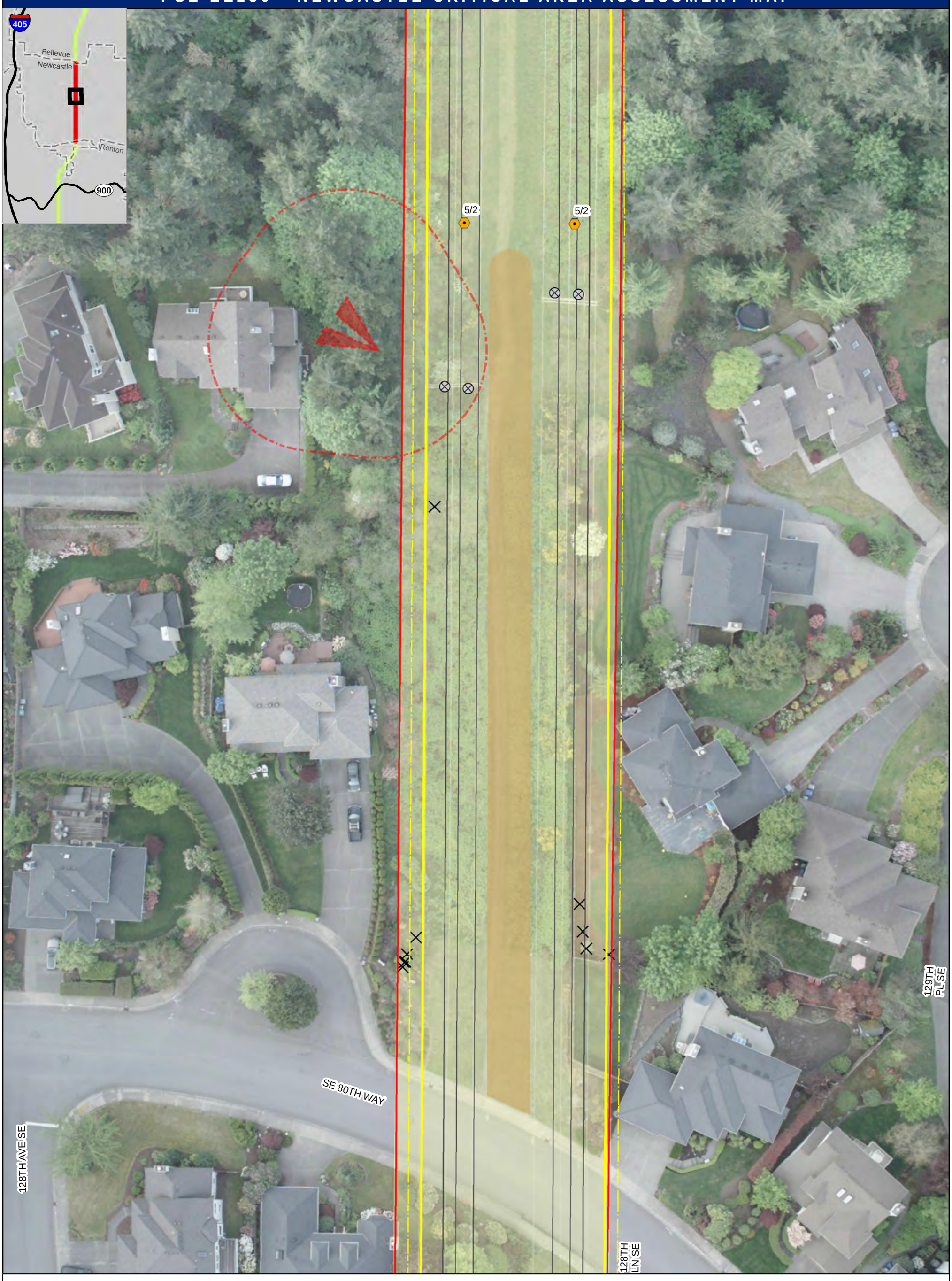
3

N

0 20 40
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP



Critical Area Study Limits[1 TWC]
City Limit[KC]
Wires [PSE]
Wire Zone[PSE]
Managed Right-of-Way [PSE]
Maintained Legal ROW [PSE]
-pale yellow shading

Proposed Stringing Sites[HDR]
Existing Poles to be Removed [PSE]
Proposed Pole Footprints[PSE]
Proposed Access Routes[3 PSE]
Trees to Remove[TWC]

Delineated Stream Boundary [TWC]
Delineated Wetland Boundary[TWC]
Limit of Combined Functioning Wetland/Stream Buffer[2 TWC]

Stream[TWC]
Wetland[TWC]
Combined Functioning Wetland/Stream Buffer Area[2 TWC] *- white shading*

Steep Slope Hazard Area[4 TWC]
Limit of Steep Slope Hazard Area Buffer[4 TWC]
Landslide Hazard Area[KC]
Landslide Hazard Area Buffer [TWC]

Notes:
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2. Shapes representing functioning buffers are truncated 25 feet outside of the study limits.
3. Access routes shown at typical width of 20 feet.
4. Evaluated in the field by geotechnical consultant. Please refer to Geotech report and addendum.

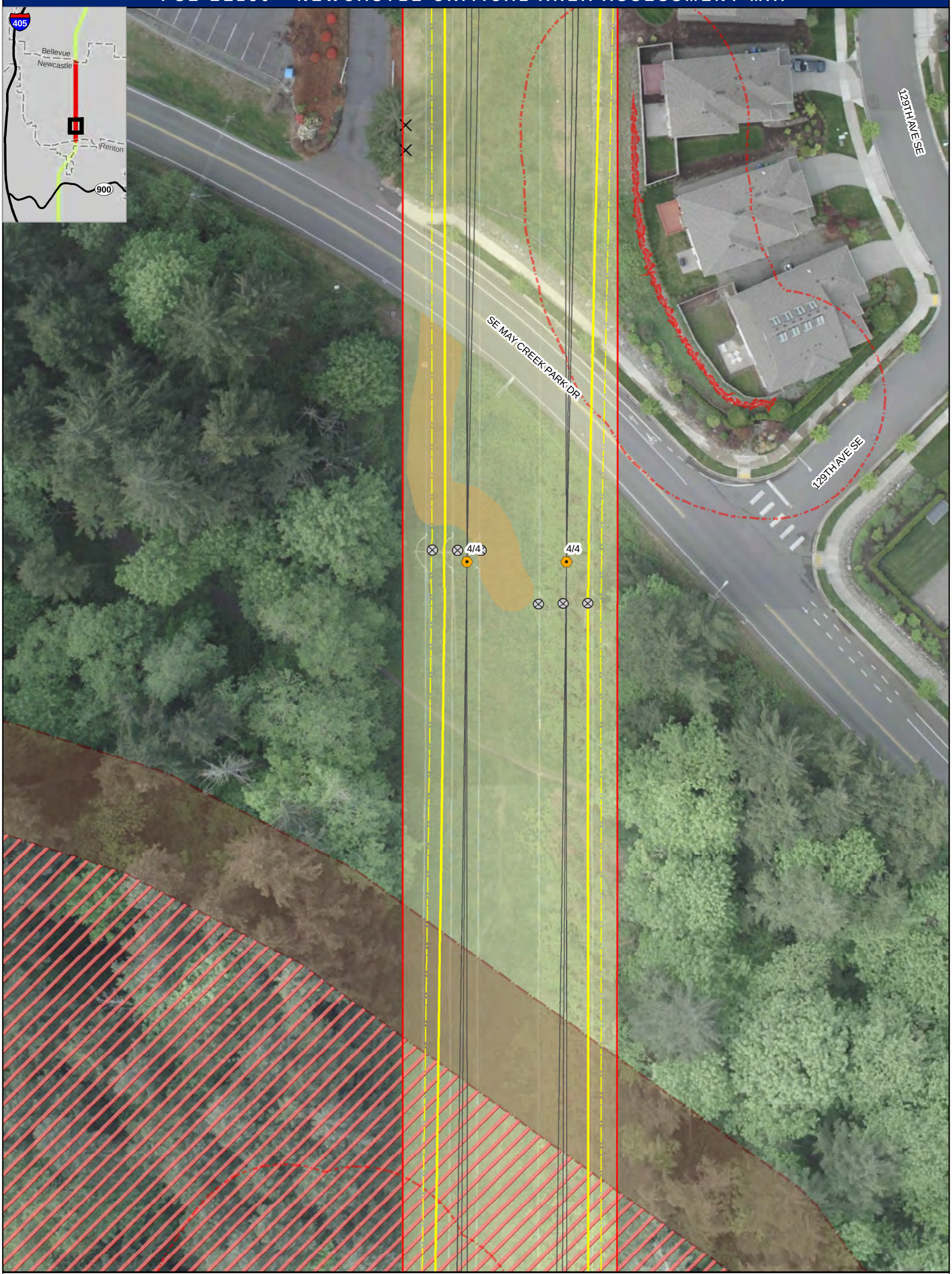
4

N

0 20 40
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP



Critical Area Study Limits[1 TWC]
City Limit[KC]
Wires [PSE]
Wire Zone[PSE]
Managed Right-of-Way [PSE]
Maintained Legal ROW [PSE] -*pale yellow shading*
Proposed Stringing Sites[HDR]
Existing Poles to be Removed [PSE]
Proposed Pole Footprints[PSE]
Proposed Access Routes[3 PSE]
Trees to Remove[TWC]
Delineated Stream Boundary [TWC]
Delineated Wetland Boundary[TWC]
Limit of Combined Functioning Wetland/Stream Buffer[2 TWC]
Stream[TWC]
Wetland[TWC]
Combined Functioning Wetland/Stream Buffer Area[2] [TWC] - *white shading*
Steep Slope Hazard Area[4] [TWC]
Limit of Steep Slope Hazard Area Buffer[4 TWC]
Landslide Hazard Area[KC]
Landslide Hazard Area Buffer [TWC]

Notes:
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3. Access routes shown at typical width of 20 feet.
4. Evaluated in the field by geotechnical consultant. Please refer to Geotech report and addendum.

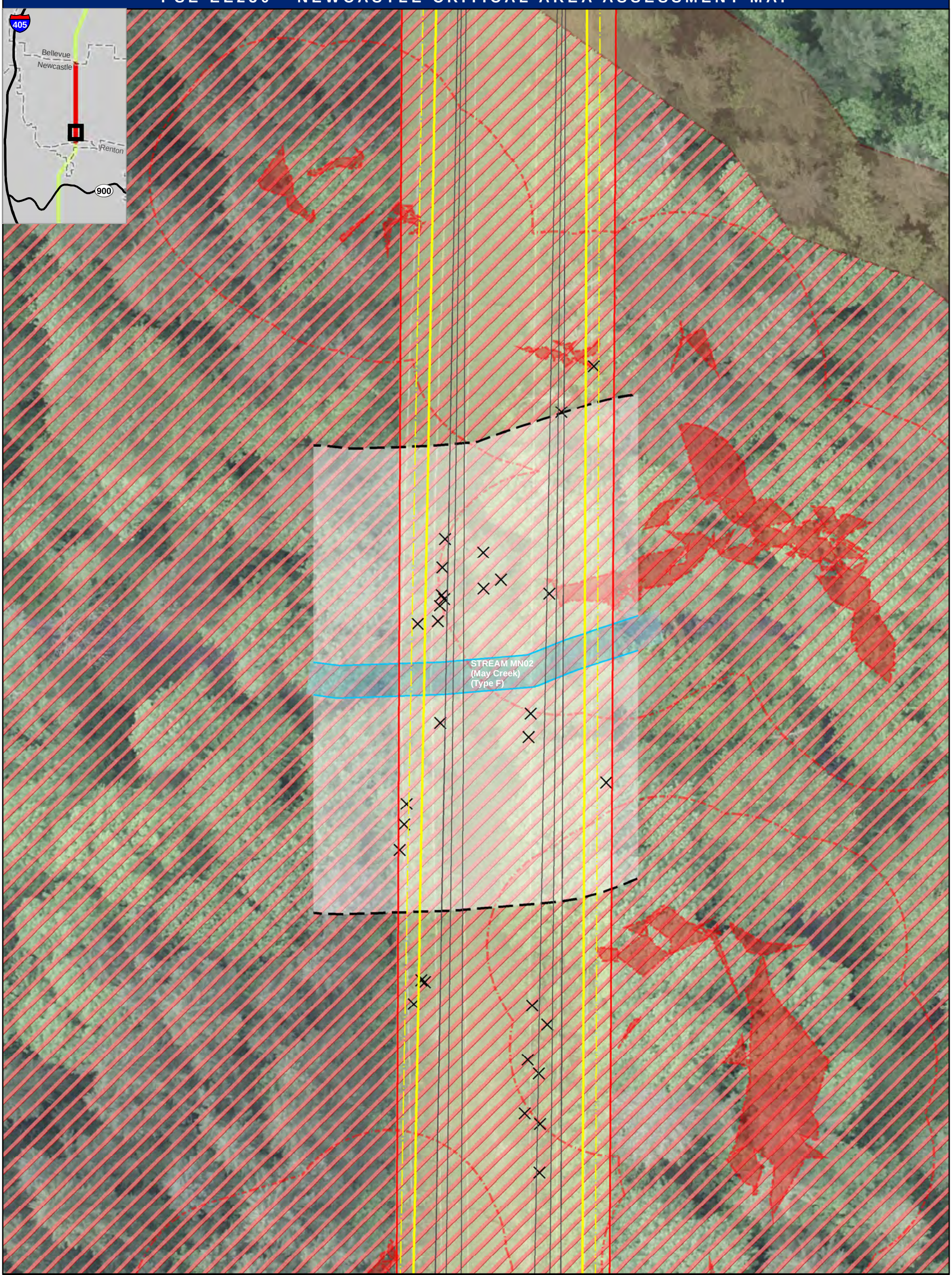
5

N

0 20 40
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP



Critical Area Study Limits[1] TWC
City Limit[KC]
Wires [PSE]
Wire Zone[PSE]
Managed Right-of-Way [PSE]
Maintained Legal ROW [PSE]
-pale yellow shading

Proposed Stringing Sites[HDR]
Existing Poles to be Removed [PSE]
Proposed Pole Footprints[PSE]
Proposed Access Routes[3] PSE
Trees to Remove[TWC]

Delineated Stream Boundary [TWC]
Delineated Wetland Boundary[TWC]
Limit of Combined Functioning Wetland/Stream Buffer[2] TWC

Stream[TWC]
Wetland[TWC]
Combined Functioning Wetland/Stream Buffer Area[2] TWC *- white shading*

Steep Slope Hazard Area[4] TWC
Limit of Steep Slope Hazard Area Buffer[4] TWC
Landslide Hazard Area[KC]
Landslide Hazard Area Buffer TWC

Notes:
1. Critical areas were defined within a 100' corridor along the existing transmission line corridor.
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3. Access routes shown at typical width of 20 feet.
4. Evaluated in the field by geotechnical consultant. Please refer to Geotech report and addendum.

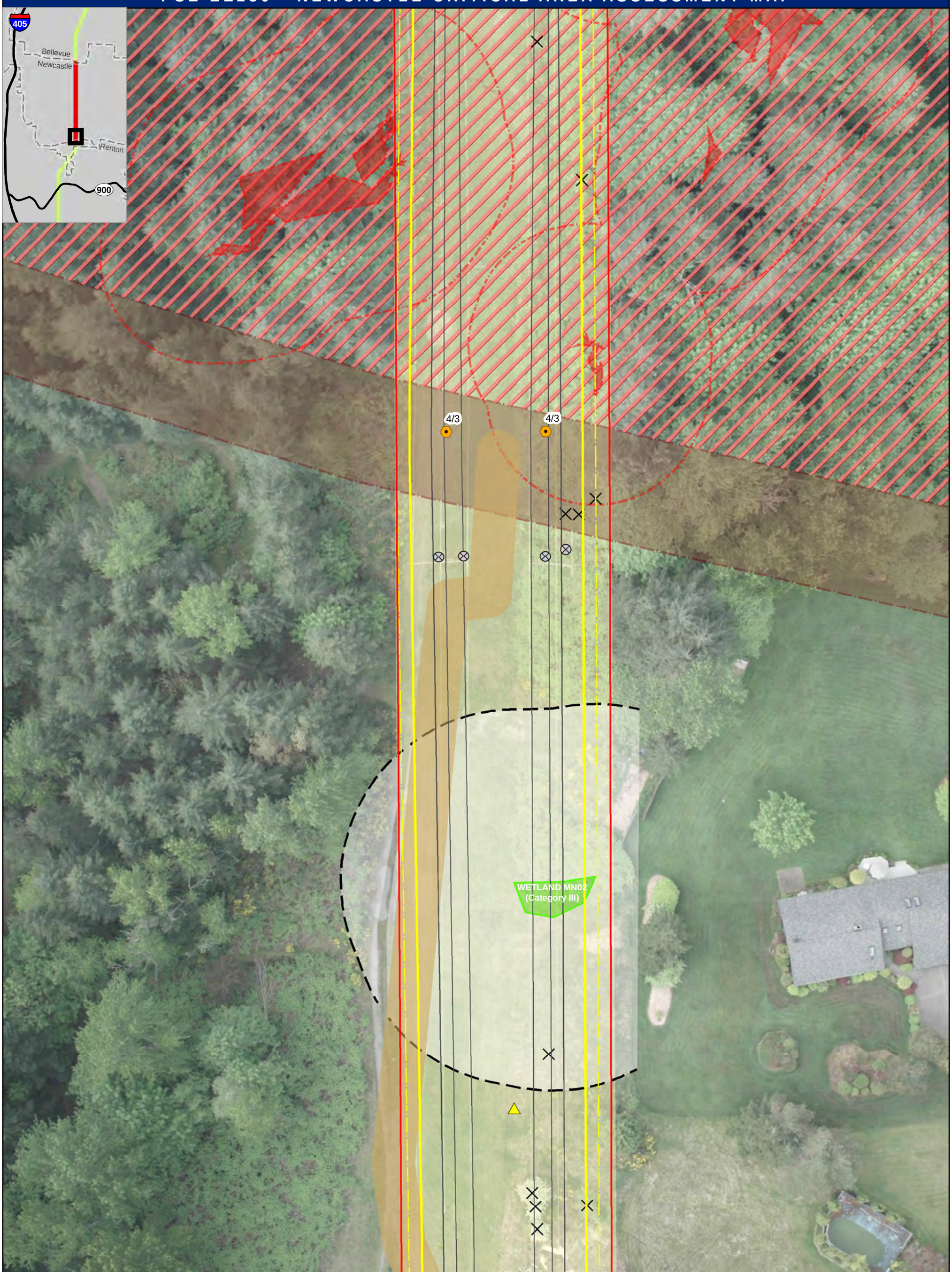
6

N

0 20 40
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

PSE EE230 - NEWCASTLE CRITICAL AREA ASSESSMENT MAP



Critical Area Study Limits[1 TWC]
City Limit[KC]
Wires [PSE]
Wire Zone[PSE]
Managed Right-of-Way [PSE]
Maintained Legal ROW [PSE]
-pale yellow shading

Proposed Stringing Sites[HDR]
Existing Poles to be Removed [PSE]
Proposed Pole Footprints[PSE]
Proposed Access Routes[3 PSE]
Trees to Remove[TWC]

Delineated Stream Boundary [TWC]
Delineated Wetland Boundary[TWC]
Limit of Combined Functioning Wetland/Stream Buffer[2 TWC]

Stream[TWC]
Wetland[TWC]
Combined Functioning Wetland/Stream Buffer Area[2 TWC] *- white shading*

Steep Slope Hazard Area[4 TWC]
Limit of Steep Slope Hazard Area Buffer[4 TWC]
Landslide Hazard Area[KC]
Landslide Hazard Area Buffer [TWC]

Notes:
1. Critical areas were defined within a 100' corridor along the existing transmission line corridor.
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3. Access routes shown at typical width of 20 feet.
4. Evaluated in the field by geotechnical consultant. Please refer to Geotech report and addendum.

7

N

0 20 40
Feet

Data sources: Puget Sound Energy (PSE), The Watershed Company (TWC), City of Newcastle (CON), King County (KC), and HDR. Aerial imagery from PSE, 2011.

APPENDIX B

City of Newcastle Wetland and Stream Re-classification Study

September 15, 2017

Kelly Purnell
Project Manager
PSE Energize Eastside
355 110th Avenue NE
Bellevue, WA 98004
Via email: Kelly.Purnell@pse.com

Re: Newcastle Wetland and Stream Re-classification Study – PSE Energize Eastside Project
The Watershed Company Reference Number: 111103.8

Dear Kelly:

This letter presents the findings of a wetland and stream critical areas classification update based upon City of Newcastle's updated Critical Areas Ordinance (CAO). It should be included as an appendix to the *City of Newcastle Critical Areas Delineation Report: Puget Sound Energy – Energize Eastside Project* (The Watershed Company 2016). The following documents are enclosed:

- 2014 Ecology Wetland Rating Forms and Figures

Methods

Previously delineated and classified wetlands in the city of Newcastle along the proposed Energize Eastside Project route were re-rated using the Department of Ecology's (Ecology) *2014 Update to the Western Washington Wetland Rating System* (Ecology publication #14-06-029) (2014 Rating System). Streams located in Newcastle along the proposed route were also re-classified according to the Newcastle's updated stream typing system.

Wetlands were revisited on April 27, 2017, to assess vegetation structure, vegetation composition, and nearby priority habitats for the purpose of rating. 2014 rating forms and figures were finalized in the office based upon the April site visit, aerial imagery, online resources, and best professional judgement.

Stream classifications were updated based upon physical characteristics observed, and online resources reviewed, during the initial 2015 delineation study.

Findings

Two wetlands and two streams are located in the city of Newcastle along the Energize Eastside Project route.

Wetlands MN01 and MN02 were previously classified according to Ecology's 2004 wetland rating system as Category IV and III, respectively. Under the 2014 Rating System, Wetland MN01 rates as Category III; Wetland MN02 remains Category III. For Wetland MN01, the change from a Category IV to Category III is, in part, due to the fact that in 2015, when MN01 was initially rated, MN01 appeared to have been recently disturbed and was sparsely vegetated. Since then, emergent vegetation has become established providing greater functions than when the wetland was sparsely vegetated. The landscape position of MN01 in relation to Ecology-mapped Category 5 (303d-listed) waters also contributed to the increased rating.

Streams MN01 and MN02, previously classified as Class III and Class II, are now classified as Type Ns and Type F, respectively.

Updated wetland and stream classification information has been incorporated into the overall Project mapping and database.

Regulatory Implications

Critical areas in Newcastle are regulated under Chapter 18.24 (Critical Areas) of the Newcastle Municipal Code (NMC).

For Wetland MN01, the change in wetland category from a Category IV to a Category III, increases the required standard buffer width from 40 to 60 feet. Wetland classifications and buffer widths presented in the *City of Newcastle Critical Areas Delineation Report: Puget Sound Energy – Energize Eastside Project* (The Watershed Company 2016), based upon the 2004 Ecology rating system, are provided in Table 1. Updated wetland classifications and buffer widths, based upon the 2014 Rating System, are provided in Table 2, below.

While the way in which streams are classified changed with the City's CAO update, buffer widths for Streams MN01 and MN02 remain the same as those presented in the delineation report (Table 3).

The buffers widths provided in Tables 1 and 2 are the standard buffer width required by the NMC. Extensions or reductions that are required or allowed by the NMC are not

discussed here, but will be addressed in the Critical Areas Report and associated critical area maps for the Energize Eastside Project.

Table 1. 2004 wetland ratings and associated buffer widths.

Wetland Name	2004 Ecology Wetland Rating				Category	Standard Buffer Width (feet)*
	Water Quality	Hydrology	Habitat	Total		
MN01	4	10	11	25	IV	40
MN02	10	10	10	30	III	60

*Assumes moderate- to high-impact land use.

Table 2. 2014 wetland ratings and associated buffer widths.

Wetland Name	2014 Ecology Wetland Rating				Category	Standard Buffer Width (feet)*
	Water Quality	Hydrology	Habitat	Total		
MN01	6	7	3	16	III	60
MN02	7	6	3	16	III	60

*Assumes moderate- to high-impact land use.

Table 3. Summary of stream classification and associated standard buffer widths.

Stream Name	*Old* Stream Type	*Updated* Stream Type	Standard Buffer Width (feet)
MN01	Class III	Type Ns	25
MN02 (May Creek)	Class II	Type F	100

Disclaimer

The information contained in this letter is based on the application of technical guidelines currently accepted as the best available science and in conjunction with the manuals and criteria outlined in the methods section. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, state and federal regulatory authorities. No other warranty, expressed or implied, is made.

Please call if you have any questions or if we can provide you with any additional information.

Sincerely,

Katy Crandall, WPIT
Ecologist / Arborist

Enclosures: 2014 Wetland Rating Forms and Figures

RATING SUMMARY – Western Washington

Name of wetland (or ID #): MN01 Date of site visit: 4/26/2017

Rated by: K. Crandall Trained by Ecology? ☒Y ☐N Date of training: 9/2014

HGM Class used for rating: Depressional Wetland has multiple HGM classes? ☒Y ☐N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map: Google Earth, King County iMap

OVERALL WETLAND CATEGORY (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

- ☐ **Category I** – Total score = 23 - 27
- ☐ **Category II** – Total score = 20 - 22
- ☒ **Category III** – Total score = 16 - 19
- ☐ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M (L)	H M (L)	H M (L)	
Landscape Potential	H (M) L	(H) M L	H M (L)	
Value	(H) M L	(H) M L	H M (L)	TOTAL
Score Based on Ratings	6	7	3	16

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name: MN01

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	2
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	3
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	6

HGM Classification of Wetlands in Western Washington

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

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

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   ☒NO – go to 2 ☐**YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   ☒NO – go to 3 ☐**YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ☐The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ☐At least 30% of the open water area is deeper than 6.6 ft (2 m).

   ☒NO – go to 4 ☐**YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ☐The wetland is on a slope (*slope can be very gradual*),
   ☐The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ☐The water leaves the wetland **without being impounded**.

   ☒NO – go to 5 ☐**YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ☐The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ☐The overbank flooding occurs at least once every 2 years.

☒NO – go to 6 ☐**YES** – The wetland class is **Riverine**

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

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

☒NO – go to 7 ☐**YES** – The wetland class is **Depressional**

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

☒NO – go to 8 ☐**YES** – The wetland class is **Depressional**

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

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

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

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

Wetland name: MN01

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: ☐ Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 ☒ Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing. points = 1 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* ☐Yes = 4 ☒ No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): ☐ Wetland has persistent, ungrazed, plants > 95% of area points = 5 ☒ Wetland has persistent, ungrazed, plants > 1/2 of area points = 3 ☐ Wetland has persistent, ungrazed plants > 1/10 of area points = 1 ☐ Wetland has persistent, ungrazed plants < 1/10 of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* ☐ Area seasonally ponded is > ½ total area of wetland points = 4 ☐ Area seasonally ponded is > ¼ total area of wetland points = 2 ☒ Area seasonally ponded is < ¼ total area of wetland points = 0	0
Total for D 1 Add the points in the boxes above	5

Rating of Site Potential If score is: ☐**12-16 = H** ☐**6-11 = M** ☒**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	☒Yes = 1 ☐ No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	☒Yes = 1 ☐ No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	☐Yes = 1 ☒ No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source:	☐Yes = 1 ☒ No = 0	0
Total for D 2	Add the points in the boxes above	2

Rating of Landscape Potential If score is: ☐**3 or 4 = H** ☒**1 or 2 = M** ☐**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	☒Yes = 1 ☐ No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	☒Yes = 1 ☐ No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)?	☐Yes = 2 ☒ No = 0	0
Total for D 3	Add the points in the boxes above	2

Rating of Value If score is: ☒**2-4 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

Wetland name: MN01

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: ☐ Wetland is a depression or flat depression with no surface water leaving it (no outlet). points = 4 ☒ Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1 ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing. points = 0	2
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* ☐ Marks of ponding are 3 ft or more above the surface or bottom of outlet. points = 7 ☐ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet. points = 5 ☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet. points = 3 ☐ The wetland is a "headwater" wetland. points = 3 ☐ Wetland is flat but has small depressions on the surface that trap water. points = 1 ☒ Marks of ponding less than 0.5 ft (6 in). points = 0	0
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of the unit. points = 5 ☐ The area of the basin is 10 to 100 times the area of the unit. points = 3 ☒ The area of the basin is more than 100 times the area of the unit. points = 0 ☐ Entire wetland is in the Flats class. points = 5	0
Total for D 4 Add the points in the boxes above	2

Rating of Site Potential If score is: ☐**12-16 = H** ☐**6-11 = M** ☒**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? ☒Yes = 1 ☐ No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? ☒Yes = 1 ☐ No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? ☒Yes = 1 ☐ No = 0	1
Total for D 5 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ☒**3 = H** ☐**1 or 2 = M** ☐**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • ☒ Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • ☐ Surface flooding problems are in a sub-basin farther down-gradient. points = 1 ☐ Flooding from groundwater is an issue in the sub-basin. points = 1 ☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why:* .... points = 0 ☐There are no problems with flooding downstream of the wetland. points = 0	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? ☐Yes = 2 ☒ No = 0	0
Total for D 6 Add the points in the boxes above	2

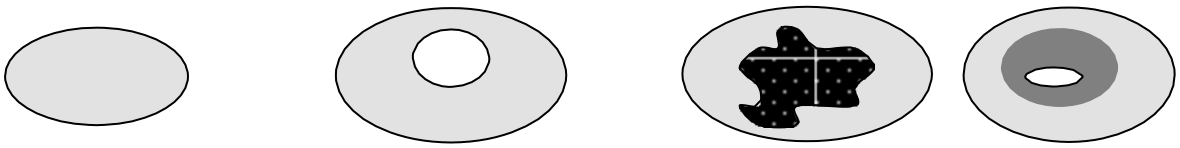
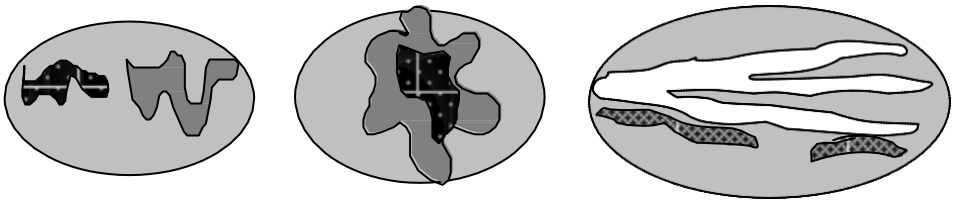
Rating of Value If score is: ☒**2-4 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

Wetland name: MN01

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

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

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☐ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ☐ Standing snags (dbh > 4 in) within the wetland. ☐ Undercut banks are present for at least 6.6 ft (2 m) **AND/OR** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m). ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) **OR** signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed).* ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians).* ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*).	0
Total for H 1 — Add the points in the boxes above	3

Rating of Site Potential If score is: ☐**15-18 = H** ☐**7-14 = M** ☒**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat + [(%moderate and low intensity land uses)/2] = **0% + (6.9%/2) = 3.5%** If total accessible habitat is: ☐ > 1/3 (33.3%) of 1 km Polygon — points = 3 ☐ 20-33% of 1 km Polygon — points = 2 ☐ 10-19% of 1 km Polygon — points = 1 ☒ < 10% of 1 km Polygon — points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat + [(%moderate and low intensity land uses)/2 **= 9.2% + (6.9%/2) = 12.7%** ☐ Undisturbed habitat > 50% of Polygon — points = 3 ☐ Undisturbed habitat 10-50% and in 1-3 patches — points = 2 ☒ Undisturbed habitat 10-50% and > 3 patches — points = 1 ☐ Undisturbed habitat < 10% of 1 km Polygon — points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If ☒ > 50% of 1 km Polygon is high intensity land use — points = (- 2) ☐ ≤ 50% of 1 km Polygon is high intensity — points = 0	-2
Total for H 2 — Add the points in the boxes above	-1

Rating of Landscape Potential If score is: ☐**4-6 = H** ☐**1-3 = M** ☒**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: — points = 2 ☐ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ☐ Site has 1 or 2 priority habitats (listed on next page) within 100 m — points = 1 ☒ Site does not meet any of the criteria above — points = 0	0

Rating of Value If score is: ☐**2 = H** ☐**1 = M** ☒**0 = L** *Record the rating on the first page*

WDFW Priority Habitats

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

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

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

☐ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

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

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RATING SUMMARY – Western Washington

Name of wetland (or ID #): MN02 Date of site visit: 4/26/2017

Rated by: K. Crandall Trained by Ecology? ☒Y ☐N Date of training: 9/2014

HGM Class used for rating: Slope Wetland has multiple HGM classes? ☐Y ☒N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map: Google Earth

OVERALL WETLAND CATEGORY (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

☐ **Category I** – Total score = 23 - 27

☐ **Category II** – Total score = 20 - 22

☒ **Category III** – Total score = 16 - 19

☐ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H M (L)	H M (L)	
Landscape Potential	H (M) L	H (M) L	H M (L)	
Value	(H) M L	(H) M L	H M (L)	**TOTAL**
Score Based on Ratings	7	6	3	16

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland Name: MN02

Maps and figures required to answer questions correctly for Western Washington

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	7
Hydroperiods	H 1.2	8
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	9
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	9
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	7
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	10
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	11
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	12

Wetland name: MN02

HGM Classification of Wetlands in Western Washington

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

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

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   ☒NO – go to 2 ☐**YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   ☒NO – go to 3 ☐**YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ☐The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ☐At least 30% of the open water area is deeper than 6.6 ft (2 m).

   ☒NO – go to 4 ☐**YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ☒The wetland is on a slope (*slope can be very gradual*),
   ☒The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ☒The water leaves the wetland **without being impounded**.

   ☐NO – go to 5 ☒**YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ☐The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ☐The overbank flooding occurs at least once every 2 years.

Wetland name: MN02

☐NO – go to 6 ☐**YES** – The wetland class is **Riverine**

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

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

☐NO – go to 7 ☐**YES** – The wetland class is **Depressional**

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

☐NO – go to 8 ☐**YES** – The wetland class is **Depressional**

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

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

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

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

Wetland name: MN02

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)* ☐ Slope is 1% or less — points = 3 ☒ Slope is > 1%-2% — points = 2 ☐ Slope is > 2%-5% — points = 1 ☐ Slope is greater than 5% — points = 0	2
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* ☒ Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 ☐ Dense, uncut, herbaceous plants > ½ of area — points = 3 ☐ Dense, woody, plants > ½ of area — points = 2 ☐ Dense, uncut, herbaceous plants > ¼ of area — points = 1 ☐ Does not meet any of the criteria above for plants — points = 0	6
Total for S 1 — Add the points in the boxes above	8

Rating of Site Potential If score is: ☐**12 = H** ☒**6-11 = M** ☐**0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? ☒Yes = 1 ☐ No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources: ☐Yes = 1 ☒ No = 0	0
Total for S 2 — Add the points in the boxes above	1

Rating of Landscape Potential If score is: ☒**1-2 = M** ☐**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? ☒Yes = 1 ☐ No = 0	1
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. ☒Yes = 1 ☐ No = 0	1
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the basin in which unit is found.* ☐Yes = 2 ☒ No = 0	0
Total for S 3 — Add the points in the boxes above	2

Rating of Value If score is: ☒**2-4 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

Wetland name: MN02

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually >1/8 in), or dense enough, to remain erect during surface flows.* ☐ Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 ☒ All other conditions points = 0	0

Rating of Site Potential If score is: ☐**1 = M** ☒**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? ☒Yes = 1 ☐ No = 0	1

Rating of Landscape Potential If score is: ☒**1 = M** ☐**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: ☒ The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 ☐ Surface flooding problems are in a sub-basin farther down-gradient points = 1 ☐ No flooding problems anywhere downstream points = 0	2
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? ☐Yes = 2 ☒ No = 0	0
Total for S 6 Add the points in the boxes above	2

Rating of Value If score is: ☒**2-4 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

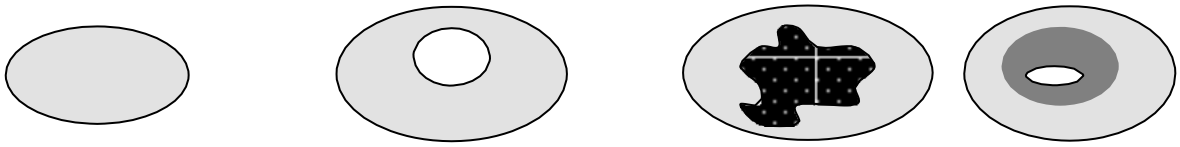
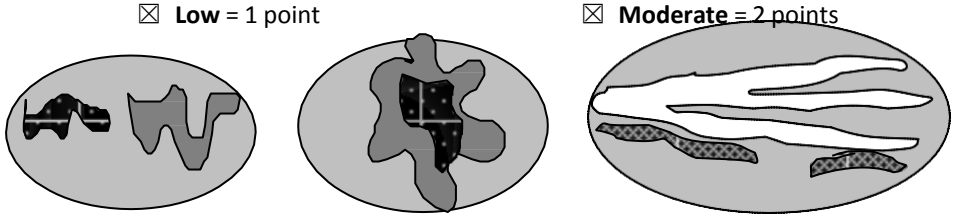
NOTES and FIELD OBSERVATIONS:

Wetland name: MN02

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

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

Wetland name: MN02

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☐ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ☐ Standing snags (dbh > 4 in) within the wetland. ☐ Undercut banks are present for at least 6.6 ft (2 m) **AND/OR** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m). ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) **OR** signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed).* ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians).* ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*).	0
Total for H 1 — Add the points in the boxes above	4

Rating of Site Potential If score is: ☐**15-18 = H** ☐**7-14 = M** ☒**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat + [(%moderate and low intensity land uses)/2] = **12.1 + (8.7/2) = 16.4%** If total accessible habitat is: ☐ > 1/3 (33.3%) of 1 km Polygon — points = 3 ☐ 20-33% of 1 km Polygon — points = 2 ☒ 10-19% of 1 km Polygon — points = 1 ☐ < 10% of 1 km Polygon — points = 0	1
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat + [(%moderate and low intensity land uses)/2 **= 14.5 + (15.8/2) = 22.4%** ☐ Undisturbed habitat > 50% of Polygon — points = 3 ☐ Undisturbed habitat 10-50% and in 1-3 patches — points = 2 ☒ Undisturbed habitat 10-50% and > 3 patches — points = 1 ☐ Undisturbed habitat < 10% of 1 km Polygon — points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If ☐ > 50% of 1 km Polygon is high intensity land use — points = (- 2) ☐ ≤ 50% of 1 km Polygon is high intensity — points = 0	-2
Total for H 2 — Add the points in the boxes above	0

Rating of Landscape Potential If score is: ☐**4-6 = H** ☐**1-3 = M** ☒**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: — points = 2 ☐ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ☐ Site has 1 or 2 priority habitats (listed on next page) within 100 m — points = 1 ☒ Site does not meet any of the criteria above — points = 0	0

Rating of Value If score is: ☐**2 = H** ☐**1 = M** ☒**0 = L** *Record the rating on the first page*

Wetland name: MN02

WDFW Priority Habitats

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

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

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

☐ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

Wetland name: MN02

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

Wetland name: MN02

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

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2014 Ecology Wetland Rating Form Figures

PSE Energize Eastside Project – Newcastle

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WETLAND MN01 (DEPRESSIONAL)

Figure 1. Cowardin plant classes and area within 150 feet of unit - H1.1, H1.4, D2.2, D5.2

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

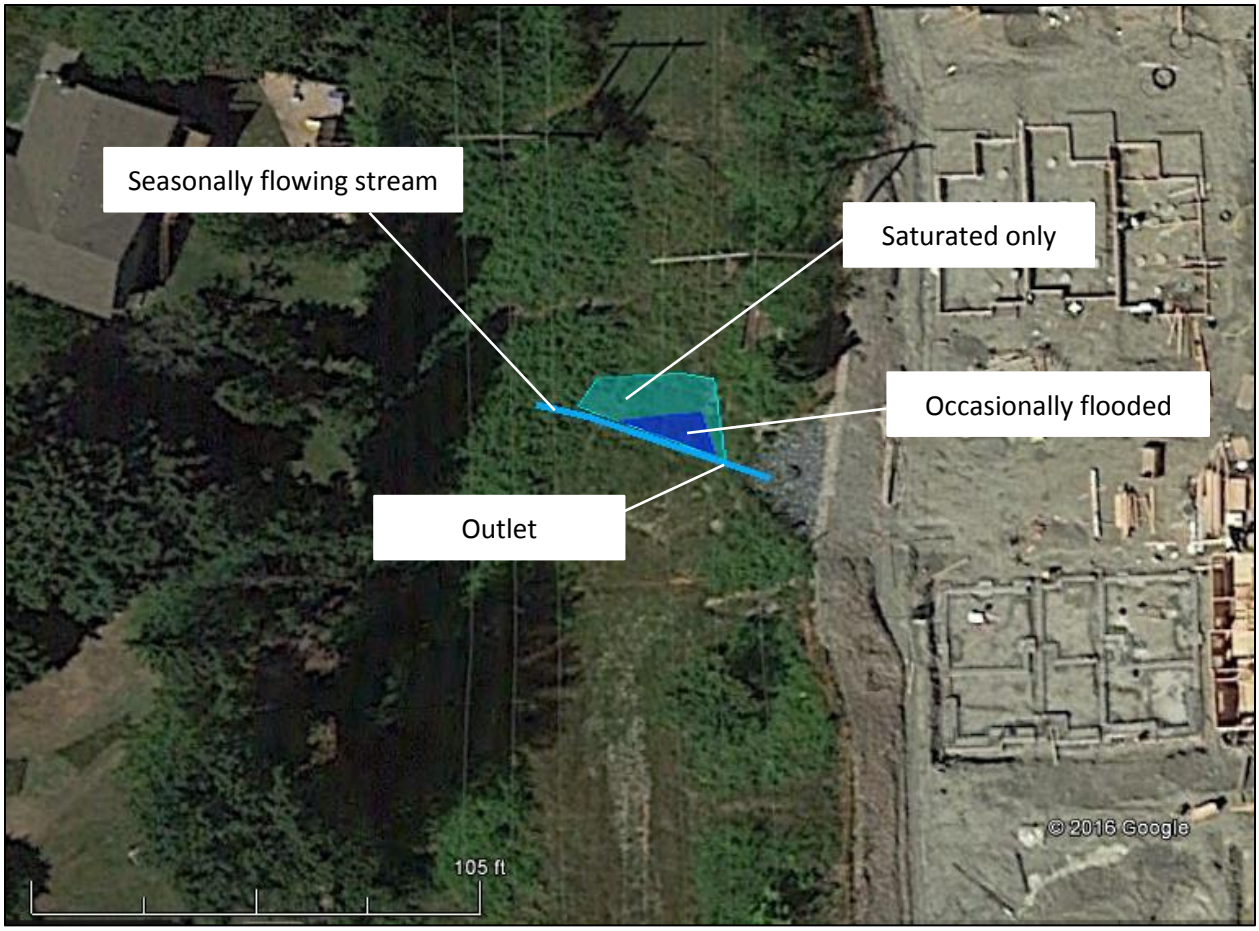


Figure 2. Hydroperiods and outlet – D1.1, D1.4, H1.2

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

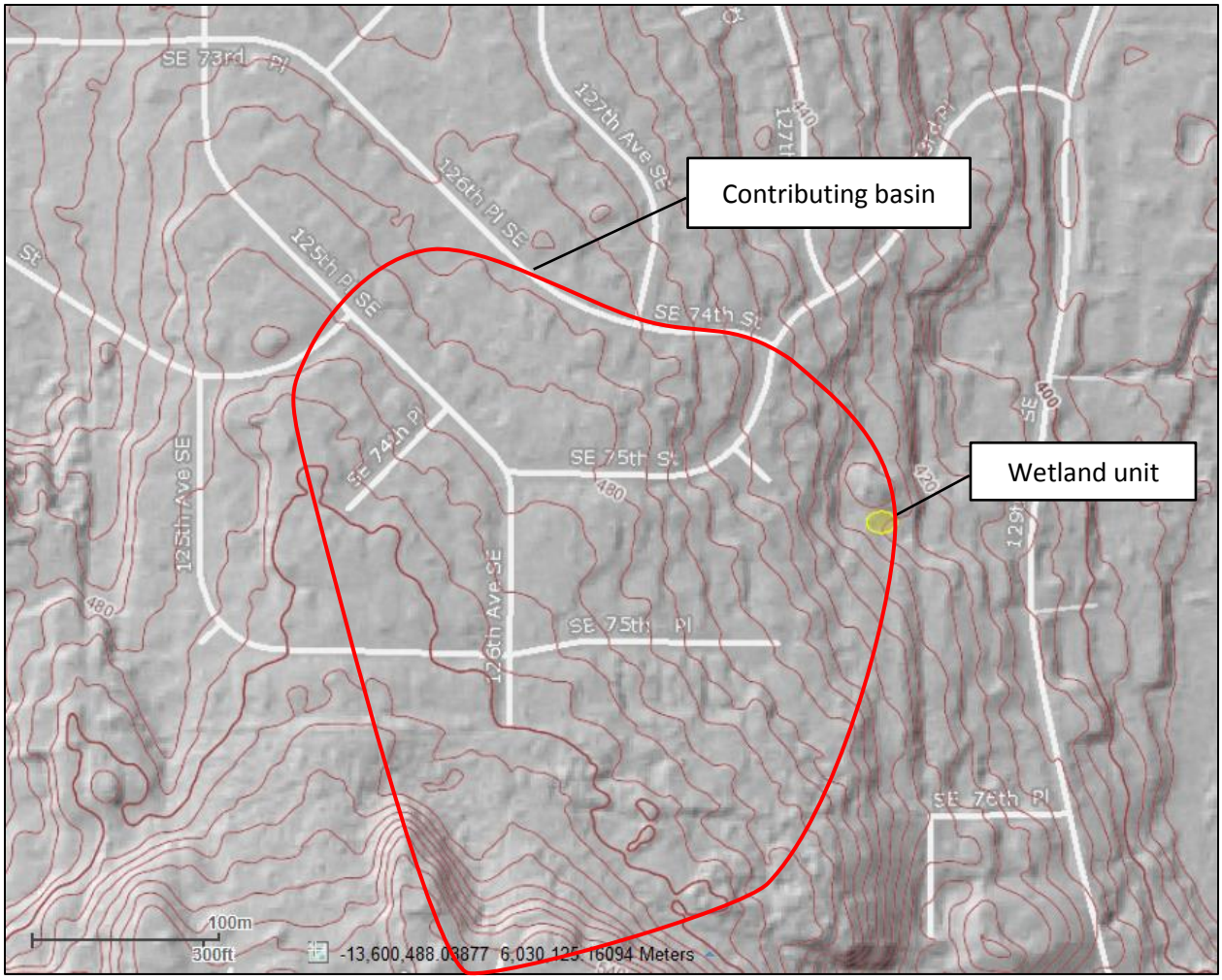


Figure 3. Map of the contributing basin – D4.3, D5.3

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

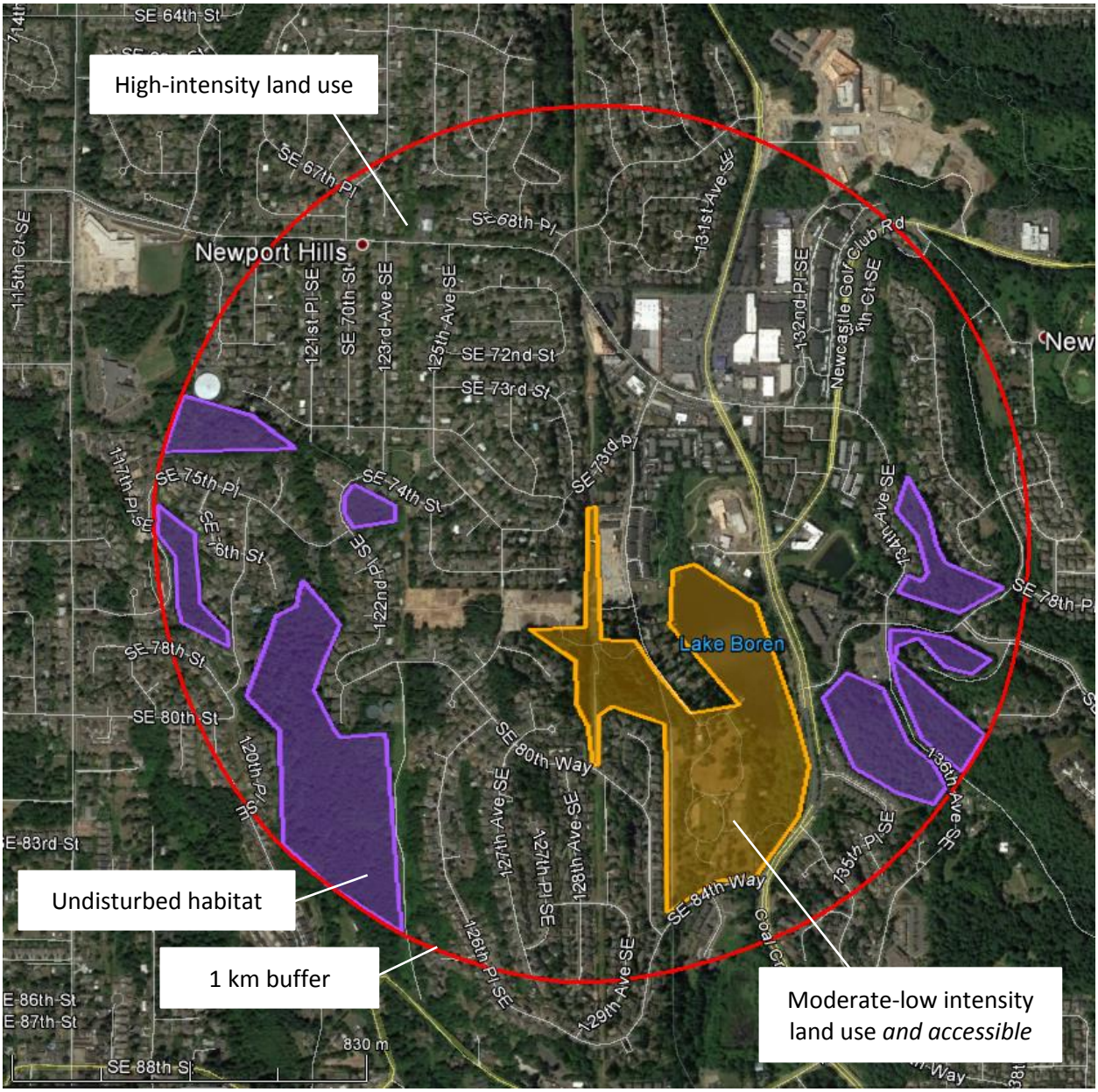


Figure 4. Undisturbed habitat and moderate-low intensity land uses within 1 km from wetland edge including polygon for accessible habitat – H2.1, H2.2, H2.3

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

Figure 5. Screen-capture of 303(d) listed waters in basin – D3.1, D3.2

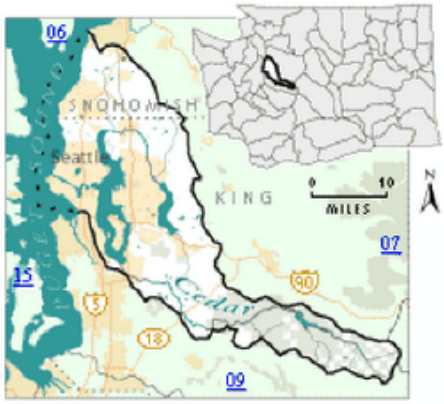
Features depicted are not to scale. Sketches are based on available data and best professional judgment.

Water Quality Improvement Projects (TMDLs)

Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 8: Cedar-Sammamish

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.



Counties

- King
- Snohomish

Wetland located in May Creek sub-basin.

Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream, Great Dane Creek, Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svricek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svricek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svricek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svricek 425-649-7036

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

Figure 6. Screen-capture of TMDL list for WRIA in which unit is found – D3.3

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

WETLAND MN02 (SLOPE)

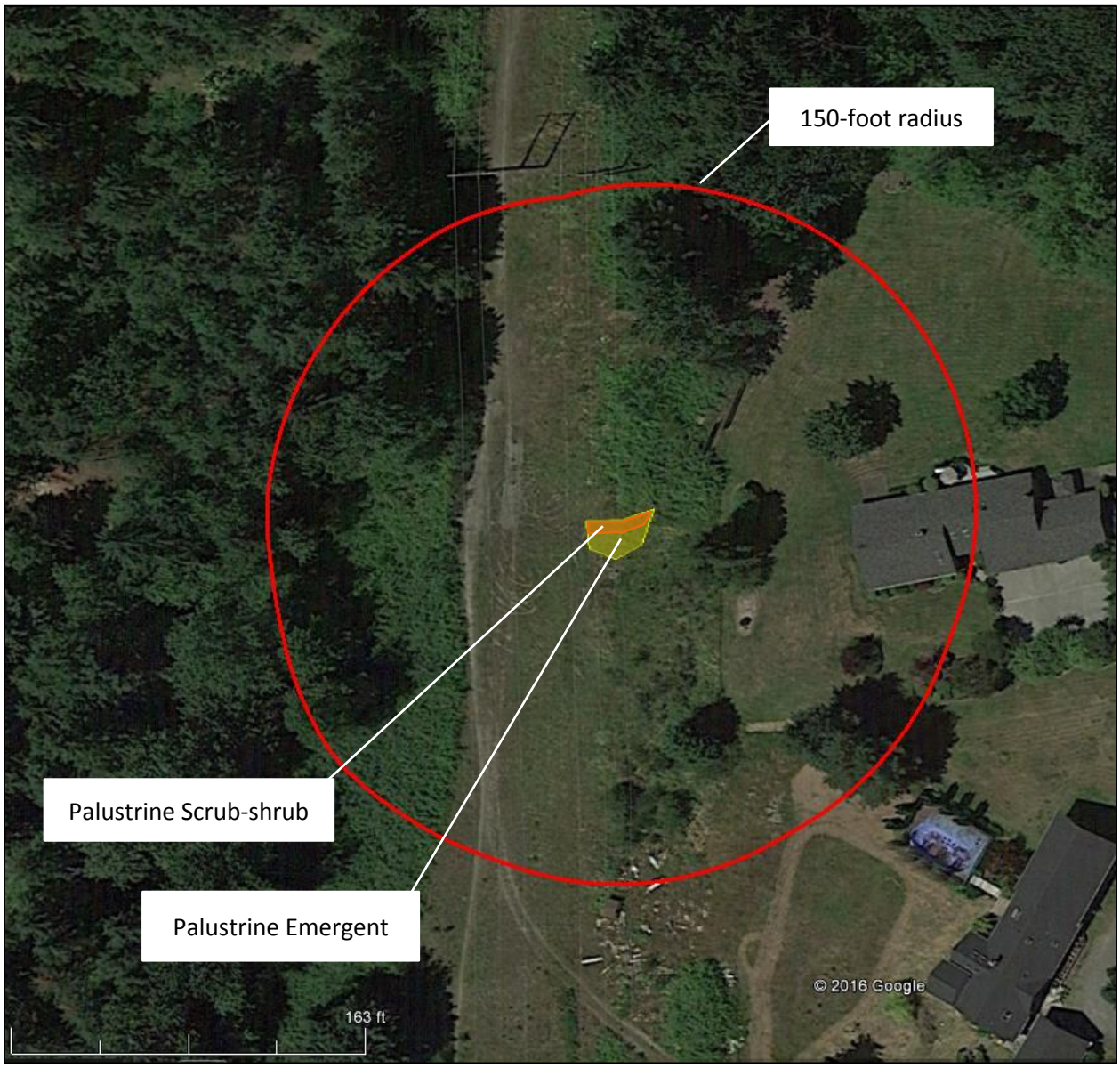


Figure 7. Cowardin plant classes and area within 150 feet of unit – H1.1, H1.4, S2.1, S5.1

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

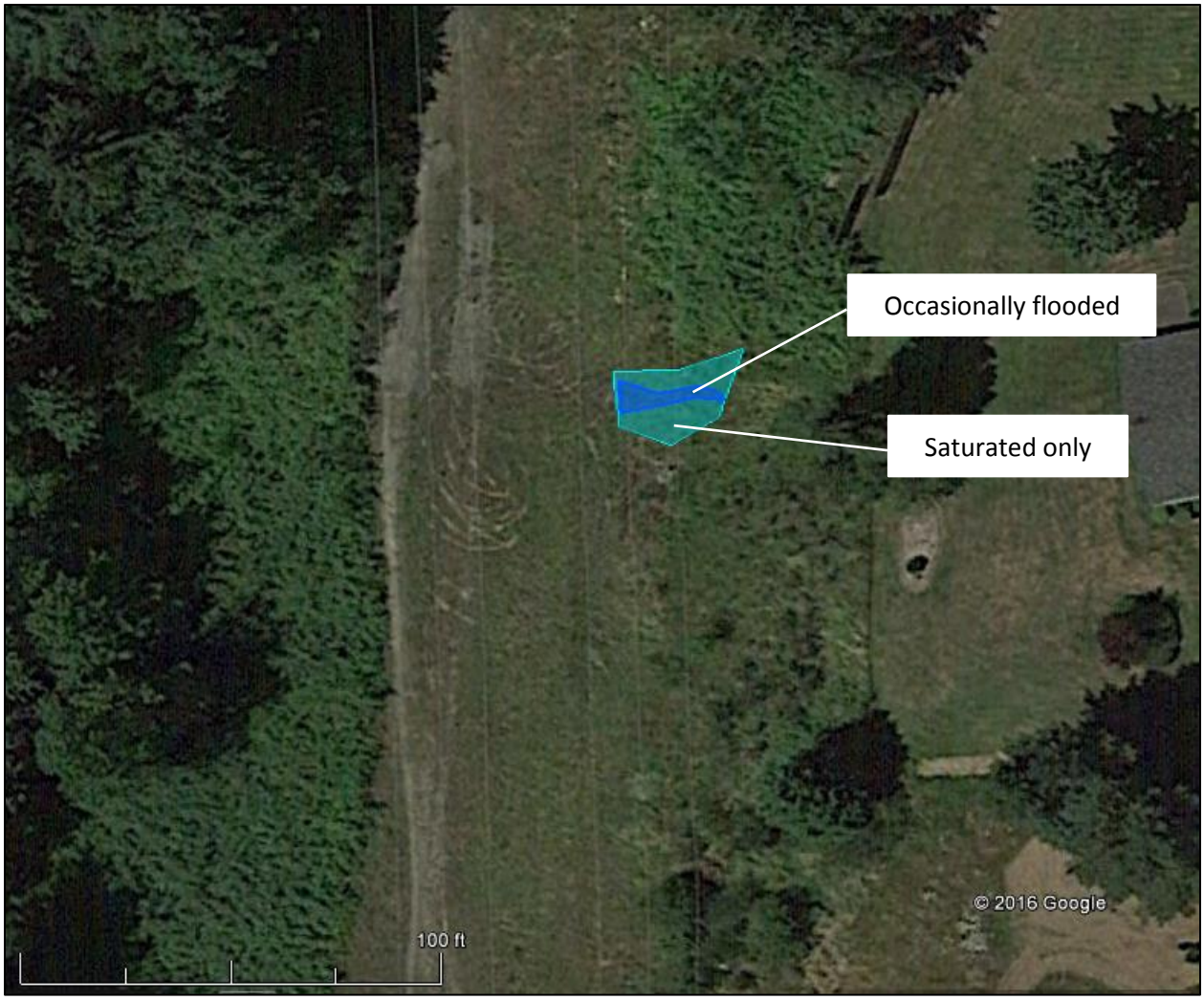


Figure 8. Hydroperiods and 150-foot buffer – H1.2

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

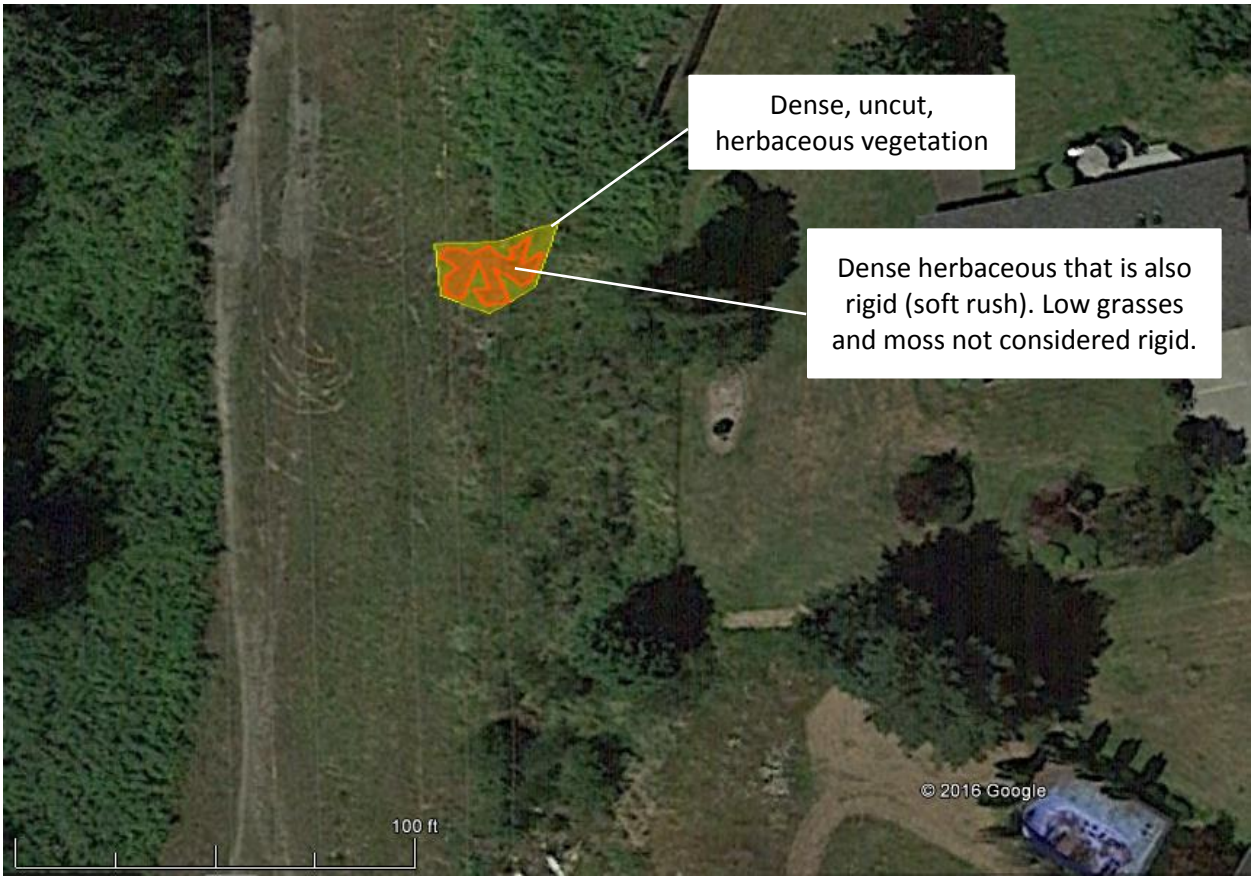


Figure 9. Plant cover of dense and rigid trees, shrubs, and herbaceous plants – S1.3, S4.1

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

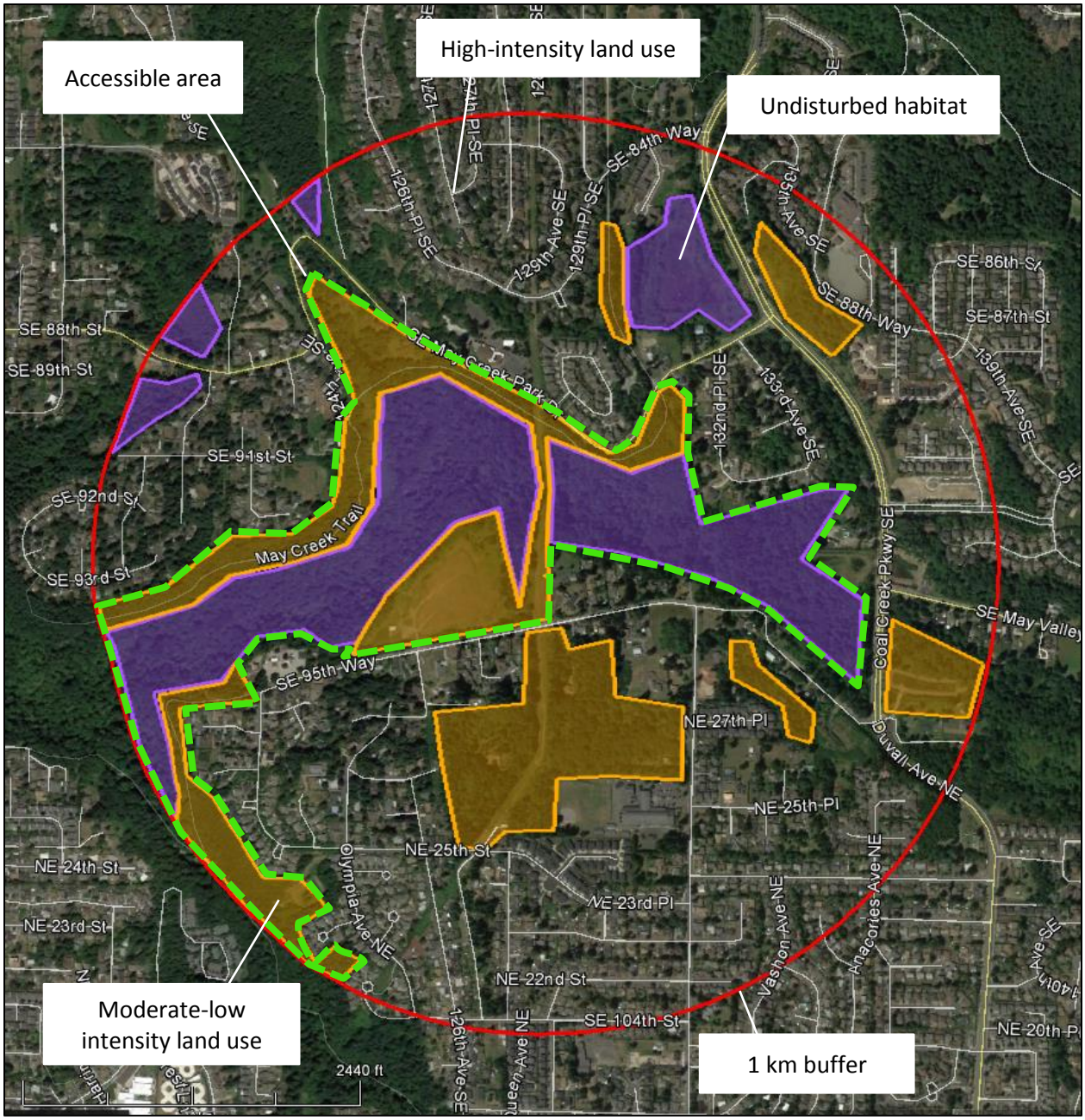


Figure 10. Undisturbed habitat and moderate-low intensity land uses within 1 km from wetland edge including polygon for accessible habitat – H2.1, H2.2, H2.3

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

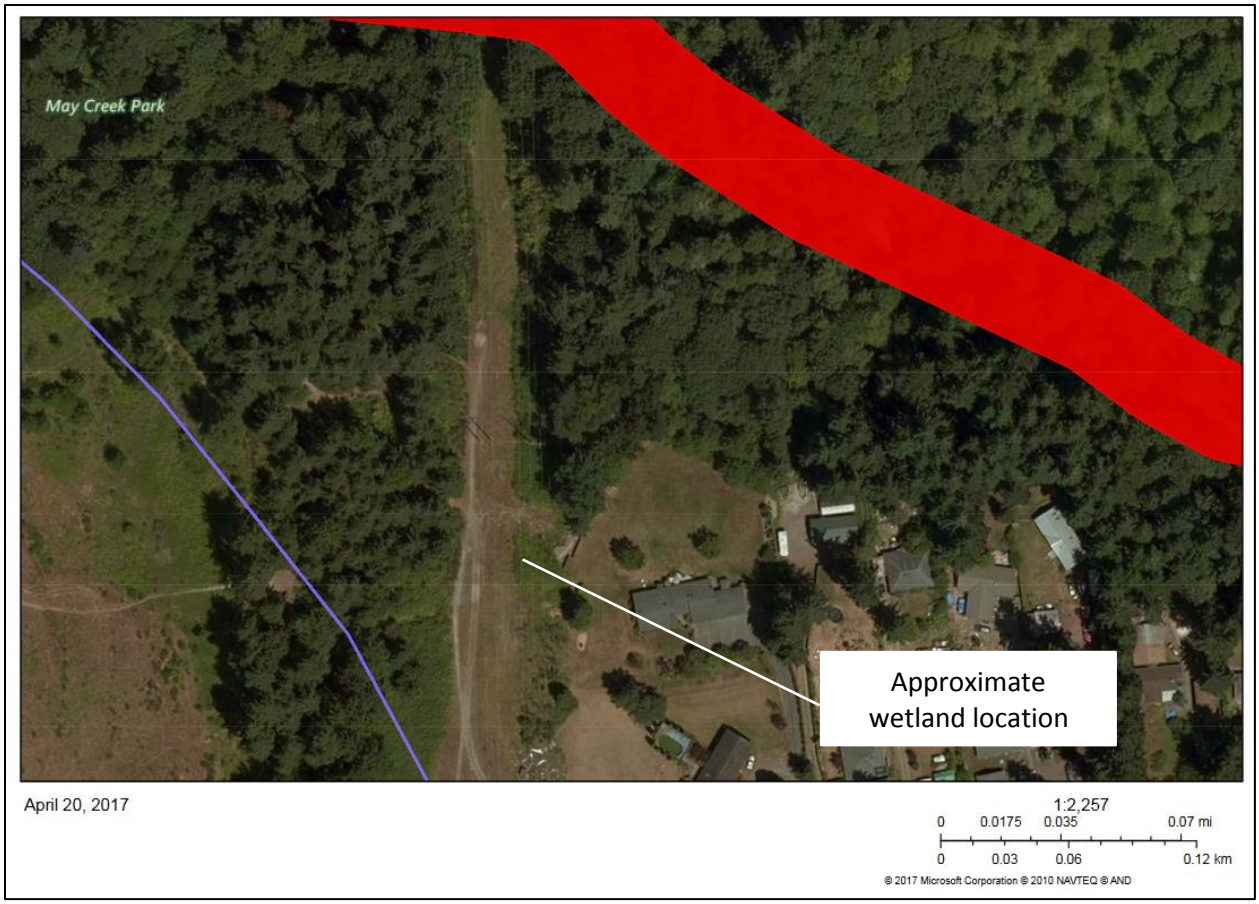


Figure 11. Screen-capture of 303(d) listed waters in basin – S3.1, S3.2

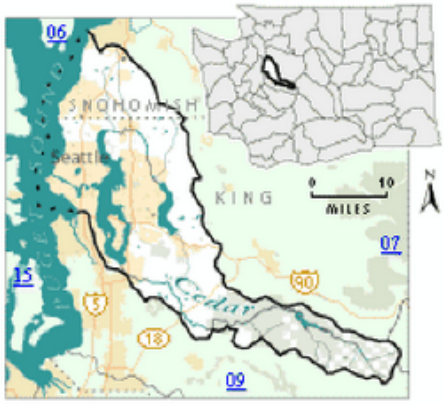
Features depicted are not to scale. Sketches are based on available data and best professional judgment.

Water Quality Improvement Projects (TMDLs)

Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 8: Cedar-Sammamish

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.



Counties

- King
- Snohomish

Wetland located in May Creek sub-basin.

Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream, Great Dane Creek, Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svricek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svricek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svricek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svricek 425-649-7036

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

Figure 12. Screen-capture of TMDL list for WRIA in which unit is found – S3.3

Features depicted are not to scale. Sketches are based on available data and best professional judgment.

APPENDIX C

Geological Hazards Report

Revised Targeted Critical Areas Geologic Hazard Evaluation

Energize Eastside Project
Newcastle, Washington

for

Puget Sound Energy

September 27, 2017

GeoEngineers
Earth Science + Technology

Revised Targeted Critical Areas Geologic Hazard Evaluation

Energize Eastside Project
Newcastle, Washington

for
Puget Sound Energy

September 27, 2017

GeoEngineers

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Revised Targeted Critical Areas Geologic Hazard Evaluation

Energize Eastside Project
Newcastle, Washington

File No. 0186-871-06

September 27, 2017

Prepared for:

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INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) is pleased to present this revised report with the results for targeted critical areas evaluation of specific geologic hazards requested by Puget Sound Energy (PSE) for the Energize Eastside Project. Our services have been provided in general accordance with the proposal between GeoEngineers and PSE dated June 21, 2017. These services were authorized by PSE on June 15, 2017, and formal authorization was received on June 26, 2017. This report addresses comments received from PSE on September 21, 2017 and supersedes previous report versions.

The project area is located along existing PSE rights-of-way and includes areas within the City of Newcastle, Washington. We previously provided a geologic hazard evaluation for various routes under consideration, including the route evaluated within this document, in a separate report submitted to PSE on December 19, 2014. Since no grade changes or buildings are proposed as part of this project, the geologic hazards evaluation included in this report focuses on a desktop review and a site-specific evaluation for steep slope, erosion and landslide hazard areas, as requested by PSE, relative to proposed tree-removal activities required for construction access and pole replacement (herein referenced as pole replacement activities), as well as vegetation management in the wire zone. Additionally, this report contains information summarized from the previous reports regarding pole stability in geologic hazard areas. PSE has provided specific locations for evaluation and also provided a proposed tree removal map developed by others.

LOCAL REGULATIONS

GeoEngineers assessed local regulations in the Newcastle Municipal Code, Technical Terms and Land Use Definitions, Chapter 18.06 and Critical Areas, Chapter 18.24 for geologic hazard areas.

General Geologic Definitions for Hazard, Hazards Areas and Buffers

The City of Newcastle criteria for defining geologic hazards and geologic hazard buffers are described below:

- Erosion*: The process by which soil particles are mobilized and transported by natural agents such as wind, rain splash, frost action, or surface water flow* (Newcastle Municipal Code 18.06.213).
- Erosion Hazard Area*: Those areas in the city of Newcastle underlain by soils which are subject to severe erosion when disturbed. Such soils include but are not limited to those classified as having a severe to very severe erosion hazard according to the USDA National Resources Conservation Service, the 1973 King County Soils Survey or any subsequent revisions or addition by or to these sources* (Newcastle Municipal Code 18.06.215). *These soils include, but are not limited to:*

    A. Any occurrence of river wash ("Rh") and any of the following when they occur on slopes 15 percent or steeper:

        1. The Alderwood gravelly sandy loam (AgD);

        2. The Alderwood and Kitsap soils (AkF);

        3. The Beausite gravelly sandy loam (BeD and BeF);

4. The Kitsap silt loam (KpD);

5. The Ovall gravelly loam (OvD and OvF);

6. The Ragnar fine sandy loam (RaD); and

7. The Ragnar-Indianola Association (RdE); and

B. Those which represent significant risk to sensitive receiving waters due to the proximity to those receiving waters and the size of the disturbed area. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-311 § 1; Ord. 2000-224 § 8; Ord. 45 § 1, 1994; Ord. 18 § 1, 1994).

According to the Newcastle Municipal Code, Critical Areas, Chapter 18.24.210, there is no stated erosion buffer requirement; however, the code states that clearing vegetation in an erosion hazard area shall be allowed only from May 1 to September 30.

- Landslide*: Episodic downslope movement of a mass including, but not limited to, soil, rock or snow.* (Newcastle Municipal Code, 18.06.350), *(Ord. 2005-311 § 1; Ord. 45 § 1, 1994; Ord. 18 § 1, 1994).*
- Landslide Hazard Areas (Newcastle Municipal Code 18.06-353).: *Those areas in the city subject to severe risks of landslides, including the following:*

A. Any area with a combination of:

1. Slopes steeper than 15 percent;

2. Impermeable soils, such as silt and clay, frequently interbedded with granular soils, such as sand and gravel; and

3. Springs or groundwater seepage;

B. Any area which has shown movement during the Holocene epoch, from 9,700 BC, or which is underlain by mass wastage debris from that epoch;

C. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action;

D. Any area which shows evidence of or is at risk from snow avalanches;

E. Any area located on an alluvial fan, or in or below a ravine or canyon presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported sediments; or

F. Areas of historic failures, such as areas designated as earthflows, mudflows, or landslides on maps published by the U.S. Geological Survey, Washington State Department of Natural Resources, and/or other research meeting the best available science criteria in WAC 365-195-915. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-311 § 1; Ord. 45 § 1, 1994; Ord. 18 § 1, 1994).

According to the Newcastle Municipal Code, Critical Areas, Chapter 18.24.270, *a buffer shall be established from all edges of the landslide hazard area. The size of the buffer shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from landslides caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet.*

- Steep Slope Hazards Areas: *Those areas on slopes 40 percent or steeper within a vertical elevation change of at least 10 feet (*Newcastle Municipal Code, 18.06.628*).* We note that there is no specific definition in the Newcastle code for Steep Slope, only Steep Slope Hazard. *For the purpose of this definition:*

  A. The toe of a slope is a distinct topographic break in slope which separates slopes inclined at less than 40 percent from slopes 40 percent or steeper. Where no distinct break exists, the toe of a steep slope is the lowermost limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet; and

  B. The top of a slope is a distinct, topographic break in slope which separates slopes inclined at less than 40 percent from slopes 40 percent or steeper. Where no distinct break exists, the top of a steep slope is the uppermost limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet (Newcastle Municipal Code 18.06.628)*. (Ord. 2005-311 § 1; Ord. 45 § 1, 1994; Ord. 18 § 1, 1994).*

- According to the Newcastle Municipal Code, Critical Areas, Chapter 18.24.300 regarding Steep Slope Hazard areas buffers:

  1. The buffer shall be established from all edges of the steep slope hazard area. The size of the buffer or setback shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from slope instability, landsliding or erosion caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. In no instance shall the minimum buffer be less than 10 feet. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet; and

  2. Buffers for steep slope hazard areas shall not be subject to provisions for buffer averaging; and

  3. Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a steep slope hazard area or buffer shall be prohibited.

EXISTING CONDITIONS

GeoEngineers used King County iMap and a previous report, titled Geologic Hazards Evaluation and Preliminary Geotechnical Engineering Services report, submitted to PSE in December 2014 (GeoEngineers 2014), to assess existing conditions in the project area within the City of Newcastle. Existing geology in this area mainly consists of glacial drift, recessional outwash, glacially consolidated till and advance outwash deposits, with the exception of alluvium and volcanic deposits or rocks. Based on a review of the previous report and existing documentation, soil types in the project area predominantly include silty gravel and silty sand, except for fine sand and silt.

There is only one landslide hazard area buffer and steep slope hazard area buffer within the project limits that will experience disturbance as a result of the proposed project activities. The area of steep slopes is within the May Creek drainage south of SE 89th Place and north of SE 95th Way, where slopes greater than 40 percent and with a 10-foot vertical elevation rise are present locally. The May Creek drainage area also includes a mapped landslide hazard area and erosion hazard area. No tree removal or pole installation is planned on any mapped steep slope hazard or landslide hazard area. Limited tree removal

and trimming is planned as is the installation of pole 4/3 within steep slope hazard buffers and mapped landslide hazard areas buffer, as well as the mapped overlaying erosion hazard area. Locally, access routes are planned south of May Creek that extend into mapped landslide area buffers (less than 40 feet laterally), erosion hazard areas and steep slope hazard buffers (less than 25 feet laterally), but do not extend within mapped steep slope hazard areas or landslide hazard areas.

Erosion hazard areas in the project area are mapped within the right-of-way from SE 76th Place, south to SE 95th Way. The majority of these erosion hazard areas are within residential developed areas; best management practices (BMPs) and restoration recommendations are provided in this report. This report will address erosion hazard areas within the May Creek area using the same BMPs recommended for the steep slope hazard buffers and landslide hazard area buffers.

A field investigation was performed on June 28, 2017 to evaluate the landslide hazard areas (including buffers), steep slope hazard areas (including buffers) and erosion hazard areas along the slopes of May Creek within the project area. We observed no active slope movement or instability within the proposed project area on the southern, (north-facing) slope of the May Creek drainage area. The slope includes a regularly mowed pipeline right-of-way with no tree cover. The terrain on the northern, (south-facing) bank of May Creek was uneven with hydrophilic plants; however, no active slope movement or instability was observed. It appears that the pipeline company had installed rockeries and silt fences on the slope for mitigation of slope stability and drainage within the pipeline right-of-way; these features are still performing as intended. We observed no active slope movement or erosion in the vicinity of the May Creek area within the project limits.

Conclusions

We observed no active slope movement or erosion within the mapped landslide, erosion and steep slope areas within the project limits in Newcastle. Additionally, the co-located pipeline company's vegetation management approach includes more clearing by comparison to what PSE is proposing for vegetation management; as such PSEs proposed construction activities (including BMPs) will not likely impact the stability of the mapped geological hazard areas with the project corridor. The proposed access south of May Creek is limited to flatter slopes that are not likely to impact mapped hazard areas downslope.

IMPACT ASSESSMENT

Vegetation Management

Vegetation management for the purposes of the project can include tree trimming and tree removal. There are two primary ways in which the tree removal activities (associated with pole replacement activities and vegetation management) may impact erosion or slope stability on steep slopes or landslide hazard areas. After tree removal, root decay causes both the numbers of roots and the tensile strength of the remaining individual roots to decrease with time (Burroughs and Thomas 1977). Studies show that the period of minimum root strength is typically from 3 to 5 years after harvest (Ziemer 1981a; 1981b), but can extend up to 10 to 20 years depending on the tree species. For example, minimum root strength in evergreens is typically 10 years after harvest, alders have a minimum root strength of 5 to 10 years after harvest, and maples typically maintain full root strength after harvest (because they regrow from the existing stump). The reductions in root strength result in a net decrease in the cohesive strength of the near-surface soil mass.

Tree removal and trimming also may modify surface and subsurface hydrology. Tree removal and trimming may increase soil moisture by reducing canopy interception and evapotranspiration. Ground-based yarding equipment can compact soil, which may alter hydrologic processes in certain loose granular soil types that are within the project area.

Elevated groundwater levels decrease the stability of slopes by reducing the shear strength of the soil and by adding additional weight. The probability of erosion and landsliding from increased groundwater levels depends on the magnitude of the increase and the existing stability of the slope. The magnitude of potential changes in groundwater levels from tree removal is highly variable and depends on several factors, including the tree size, silviculture, subsurface conditions and topography.

In general, tree removal will increase the impact of erosion and slope stability for steep slopes or landslide hazard areas. However, fewer impacts are expected in areas where: a)tree removal is isolated to one or two trees or only tree trimming; and b) the erosion hazard areas, steep slope hazard areas or landslide hazard area is otherwise stable and well vegetated. Additionally, fewer impacts are expected at hazard buffer areas, the toe of the slope, compared to tree removal within the body or at the top of the slope.

Construction Access

There are no proposed access routes in the steep slope hazard areas or landslide hazard areas. Temporary access routes will generally follow previously established access trails and routes and, in some cases, will cross existing developed landscape. Therefore, little cutting or filling will be required. Small amounts of quarry spalls might be necessary to stabilize portions of existing routes. Many of the existing routes are overgrown with vegetation and, thus, will need to be cleared of vegetation (mowing and cutting of limbs or brush). Standard erosion control BMPs should be following during clearing and use of the temporary access routes. Following completion of construction activities, restoration BMPs, such as mulching and/or placing jute matting, should be implemented if soils are exposed.

Pole Installation

Where new poles are located in erosion hazard areas, steep slope hazard area buffers, or landslide hazard area buffers; a temporary working bench might be necessary to install the pole. These benches may vary from about 10 by 10 feet to 30 by 30 feet in dimension. The same considerations discussed above for temporary construction access routes also apply to benches needed for pole installation. We recommend that clearing activities (mowing and cutting of limbs or brush) be restricted to that necessary to auger the hole for the pole.

Recommendations for the design and construction of poles are presented in our Geotechnical Engineering Services report dated June 8, 2016. In general, most of the site soils along the proposed route consist of recessional deposits or glacially consolidated deposits and, in some limited locations, bedrock. These soils should provide adequate support for the new poles, and it is our opinion that once the pole is installed, the pole will not adversely impact slope stability; the pole should actually provide additional resisting force against slope failure, provided the pole is embedded to a sufficient depth.

CONCEPTUAL IMPACT MITIGATION STRATEGY

Conclusions

The only mapped steep slope buffers in Newcastle area that will experience disturbance associated with the proposed project activities are in the May Creek drainage. Proposed tree removal and trimming activities generally avoid slopes greater than 40 percent within the May Creek corridor but are proposed within the buffer areas. The project area is within an existing right-of-way that is maintained for vegetation by PSE and includes a narrower right-of-way managed by a private petroleum pipeline company. The right-of-way for the buried petroleum pipeline includes areas with no trees and grass that is mowed regularly for pipeline-specific vegetation management. We observed no indication of slope movement in the pipeline right-of-way which is included within the PSE right-of-way. The proposed removal of about 60 selected trees in this area is less intrusive when compared with the vegetation management activities of the existing pipeline right-of-way and is not anticipated to impact the mapped geologic hazard areas within the May Creek drainage, provided that no tracked or rubber-tired equipment is used to remove the trees.

Conceptual Impact Mitigation Strategy

Vegetation Management

As mentioned in the impact assessment, vegetation management for the purposes of the project can include tree trimming and tree removal. For vegetation management including selective tree removal (associated with the pole replacement activities) in the City of Newcastle within the mapped geohazard areas outlined in the proposed PSE project segment, GeoEngineers suggests the following options for mitigating impacts after tree removal and trimming.

In general, to limit impacts on erosion and slope stability from vegetation management within erosion, steep slope hazard area buffers and landslide hazard area buffers, the sites should be accessed by foot to reduce equipment impacts. Hand cutting with chainsaws should be implemented to trim branches and remove trees. Stumps should remain in place, but can be cut to ground level. Branches, limbs, trunks and other tree debris should be chipped and scattered around the removal site within the right-of-way. Where chipping is not feasible, unchipped tree debris can be scattered.

In erosion hazard areas within the project corridor where residential areas are located within 25 to 50 feet of vegetation management, all tree debris should be removed from the owner's property and communication with the property owner is suggested to identify possible reseeding, replacement tree or shrub, or landscaping options. If agreeable to the property owner, it is possible that the tree trunk can be cut and left below ground surface to maintain root strength (up to 5 to 10 years, depending on tree type), and a replacement tree or shrub may be planted near the trimmed trunk.

Within the May Creek drainage area, where tree removal and trimming activities are occurring in erosion hazard areas, landslide hazard area buffers and steep slope hazard areas buffers it is recommended that vegetation management be done by hand cutting with chainsaws, stumps left in place and tree debris scattered. We recommend that trees are felled across the fall line and are left perpendicular to slope. All tree debris should be scattered upslope of the riparian buffer zone to reduce erosion along May Creek. Erosion controls, such as placement of stream wattles or jute mat, should be used to reduce erosion of material from the slope into May Creek.

Construction Access Routes

Where vegetation clearing (mowing and cutting of limbs or brush) is required to reestablish the access on existing trails and access routes, BMPs should be implemented in the project corridor. The BMPs can include, but are not limited to: outsloping road surfaces, crowning road surfaces (where appropriate, such as at ridge tops and where roads climb gently inclined surfaces) and installing water bars or rolling dips at regularly spaced intervals to avoid concentrating surface water flow along the road surface. The spacing depends on the grade of the route, the soil type present, proximity to streams and the intended use of the road (i.e., temporary or permanent).

Most access routes will be temporary and will be abandoned following construction of the transmission line. No temporary access roads will cross any drainages situated in geologic hazard areas.

It is the contractor's responsibility to complete construction work safely and in accordance with applicable local, state and federal laws. After access use is complete, where it is deemed necessary, limited regrading of the access route is recommended to avoid concentrating surface runoff along tracks, ruts or other potential flowpaths. Following completion of construction activities, the construction access routes may be graded to a stable free-draining configuration; and will be treated with appropriate erosion control measures, such as mulching and/or placing jute matting and installation of water bars as needed to control runoff, and seeded. If jute mat is determined a necessary BMP, the jute mat should be anchored at the upslope and downslope ends and secured with staples per the manufacturer's recommendations.

Pole Installation

Where a bench is required to install a pole on an erosion hazard area, steep slope hazard area buffers or landslide hazard area buffers, the recommendations presented above for temporary access roads also apply for pole installation. Appropriate erosion control BMPs should be implemented during construction, and the disturbed area should be restored after pole installation by seeding or revegetating and covering the disturbed area with appropriate BMPs. Soil removed from the new pole excavations should be scattered into vegetation away from any landscaped areas. Any areas of exposed soil must be seeded and mulched (or covered with hog fuel) to prevent transport of sediment down the steep slopes or into seepage areas during rain events. If the work area is wet or has standing water, driving mats should be used under all equipment and all soils excavated for pole installation should be removed from the site for off-site disposal to avoid rutting and reduce the risk for mobilization of saturated soils.

For poles located in erosion hazard areas, steep slope hazard buffers or landslide hazard buffers where feasible, old poles should be cut off approximately 1 to 2 feet below the ground surface and the remaining portion of each pole left in place.

CODE COMPLIANCE

18.24.210 Erosion Hazard Areas – Development Standards

Development proposals and other alterations on sites containing erosion hazard areas shall be allowed, pursuant to applicable permits or approvals, only if they or any other alteration complies with all applicable requirements set forth in this chapter including, but not limited to, mitigation requirements and the following standards:

A. Clearing in an erosion hazard area shall be allowed only from May 1 to September 30, except that timber harvest may be allowed pursuant to an approved forest practice permit issued by the Washington Department of Natural Resources.

Response to Code Requirement: Site activities including vegetation management (which includes tree removal and tree trimming) as well as vegetation clearing (which includes mowing and cutting of limbs or brush such as blackberries) will be completed between May 1 and September 30.

B. All subdivisions, short subdivisions, binding site plans, site plan review and planned unit developments on sites with erosion hazard areas shall retain existing vegetation in all erosion hazard areas until a building permit is approved for development on the lots, except that:

- Vegetation may be removed as necessary for construction of related infrastructure;
- Noxious weeds may be removed; and
- Timber may be harvested as allowed in subsection (A) of this section. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-325 § 5; Ord. 2005-311 § 1; Ord. 2001-247 § 6; Ord. 2000-224 § 1).

Response to Code Requirement: No subdivision or unit developments on sites are proposed relative to the proposed vegetation management activities (the primary activity in the May Creek Drainage) or the vegetation management, pole installation, or construction access located in the remainder of the corridor (erosion hazard area) within mapped geologic hazard areas and buffers. Trees removed are not proposed for timber harvest and typically will be left on site as described above unless agreed otherwise with individual property owners. Per WAC 222 and RCW 76.09, a Forest Practice Application to Washington Department of Natural Resources for limited tree removal and trimming will not be required.

18.24.215 Erosion Hazard Areas – Specific Mitigation Requirements

In addition to general mitigation requirements contained in NMC 18.24.170, the following shall apply to mitigation of adverse impacts associated with erosion hazard areas:

A. For any development proposal on a site containing an erosion hazard area, an erosion and sediment control plan shall be required and included as part of the mitigation plan. The erosion and sediment control plan shall be prepared in compliance with requirements set forth in the erosion and sediment control standards and the Surface Water Design Manual.

Response to Code Requirement: The proposed development includes vegetation management, pole installation, and construction access that will include mitigation measures to reduce potential impacts to geologic hazards that include erosion hazard areas, landslide hazard areas and steep slope hazard areas, and their associated buffers. Mitigation measures include a variety of BMPs to reduce potential impacts to geologic hazards in the vicinity of neighboring properties. BMPs include, but are not limited to: plant replacement, scattering trimmed or removing tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. The requirements of a Sediment and Erosion Control Plan will be addressed in the project-specific Temporary Erosion and Sediment Control (TESC) Plan and Construction Stormwater Pollution Prevention Plan (CSWPPP).

B. Damage to or removal of vegetation on lots in a subdivision, short subdivision or binding site plan during construction of related infrastructure shall be mitigated by stabilizing the lots in compliance with the provisions of the erosion and sediment control standards.

Response to Code Requirement: No subdivisions, short subdivisions, or binding site plan properties are located within the May Creek drainage (primarily open space associated with the surrounding riparian area), which is the only location in the existing utility corridor where tree removal and trimming activities associated with right-of-way vegetation management will result in disturbances to steep slope buffer and landslide hazard buffer areas. No poles will be replaced, nor will any access routes be re-established, in the designated steep slope and landslide hazard areas of the May Creek drainage.

Erosion hazard areas are mapped north of the May Creek drainage area in the existing utility corridor, crossing through multiple subdivisions. Right-of-way vegetation management, pole replacement, and construction access activities throughout the mapped erosion hazard area will require disturbance of portions of the residential lots located in these subdivisions. During and after construction, the disturbed area will be stabilized using the BMPs that reduce potential impacts to erosion and other geologic hazards. BMPs include, but are not limited to: plant replacement, scattering trimmed or removing tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. The requirements of a Sediment and Erosion Control Plan will be addressed in the project-specific TESC Plan and CSWPPP.

C. If a city determines that erosion from a development proposal site poses a significant risk of damage to downstream receiving waters based on the size of the project, the proximity to the receiving waters or the sensitivity of the receiving waters, the applicant shall monitor the surface water discharge from the site and submit monitoring reports as set forth in an approved mitigation plan. If the project does not meet appropriate water quality standards established by law or administrative rules, the city may suspend further development work on the site until such standards are met. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-325 § 5, Formerly 18.24.374).

Response to Code Requirement: The proposed vegetation management, pole installation, and construction access activities will use mitigation measures to include BMPs to reduce potential of damage to downstream receiving waters. Mitigation measures include, but are not limited to: plant replacement, scattering trimmed or removed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate.

18.24.270 Landslide Hazard Areas – Development Standards and Permitted Alterations

A. Development proposals and other alterations on sites containing landslide hazard areas or buffers shall comply with all applicable requirements set forth in this chapter, including, but not limited to, mitigation requirements and the following standards:

1. A buffer shall be established from all edges of the landslide hazard area. The size of the buffer shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from landslides caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet.

2. Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a landslide hazard area or buffer shall be prohibited.

3. All alterations shall be undertaken in a manner to minimize disturbance to the landslide hazard area, slope and vegetation unless necessary for slope stabilization.

Response to Code Requirement: PSE's existing public utility corridor, which is routinely maintained, crosses the wooded May Creek drainage. This drainage is mapped as a landslide hazard. The proposed removal of about 40 to 50 selected trees (and retention of at least 30 trees) in the May Creek drainage for vegetation management is consistent with the management activities of the existing power line right-of-way and is not anticipated to impact the mapped landslide hazard areas within this drainage area, provided that removal of vegetation and trees is completed by hand and/or using limited access machinery to reduce potential impacts to landslide hazard areas. Three trees (Douglas firs, ranging in diameter-breast-height from 4.2 to 5.3 inches) will be removed and two pole replacement activities will occur in the landslide hazard buffer zone. Possible mitigation measures include a variety of BMPs to reduce potential impacts to landslide hazard areas, including plant replacement (where located near existing residential properties), scattering trimmed or removed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate.

B. Alterations to landslide hazard areas and buffers may be allowed, pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, only as follows:

1. Surface water conveyances if the department finds that:

    a. Discharging the surface water at the base of the landslide hazard area has less adverse impact upon the critical area than if the surface water were dispersed at the top of the landslide hazard area; and

    b. Adverse impacts to fish are minimized, to the maximum extent possible, by maintaining the prealteration groundwater volume to support fish habitat in receiving water bodies.

2. Public and private utilities and utility corridors if the applicant shows that:

    a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

    b. Vegetation removal is limited to the minimum necessary to locate the utility or construct the corridor.

3. Normal and routine maintenance of existing public and private utility facilities and utility corridors if the applicant shows that:

    a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

    b. Vegetation removal for the purpose of utility and corridor maintenance is the minimum necessary to maintain the utility's function.

4. Vegetation removal activities, as follows:

    a. The removal of noxious weeds,

    b. The removal of vegetation, only as necessary for surveying purposes,

    c. The removal of hazard trees, as determined by the department.

5. Stabilization of sites where erosion or landsliding threatens public or private structures, utilities, roadways, driveways or publicly maintained trails or where erosion or landsliding threatens any lake, stream, wetland or shoreline. Stabilization work shall be performed in a manner which causes the least possible disturbance to the slope and its vegetative cover.

6. Exploratory drilling and testing, involving only necessary and limited clearing and grading, for the purpose of preparing critical area reports.
7. The application of herbicides or other hazardous substances, if necessary, as approved by the department.
8. Any alterations in a landslide hazard area located in an area that does not meet the criteria as a steep slope as defined under NMC 18.06.628 only if:
    a. The development proposal will not decrease slope stability on contiguous properties; and
    b. Mitigation based on the best available engineering and geological practices is implemented which either eliminates or minimizes the risk of property damage, death or injury resulting from landsliding. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-325 § 5; Ord. 2005-311 § 1; Ord. 2000-224 § 1).

Response to Code Requirement: The proposed development includes limited vegetation management, tree removal and tree trimming for the purpose of maintain the existing utility right-of-way within mapped landslide hazard areas. Tree removal and trimming in the mapped landslide hazard area will be associated with vegetation management in the wire zone and limited to selective tree removal and trimming necessary to provide system reliability and meet the federal requirements. Tree removal and trimming will be followed by mitigation measures to reduce potential impacts to landslide hazard areas. Mitigation measures include a variety of BMPs to reduce potential impacts to landslide hazard areas and slope stability on contiguous properties. BMPs include minimum removal necessary to maintain utility's function, tree/vegetation replacement, scattering trimmed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. In our opinion, the proposed vegetation management will not decrease slope stability on contiguous properties; and mitigation based on the best available engineering and geological practices will be implemented to either eliminate or minimize the risk of property damage, death or injury resulting from landsliding.

18.24.300 Steep slope hazard areas – Development standards and permitted alterations.

A. Development proposals and other alterations on sites containing steep slope hazard areas or buffers shall comply with all applicable requirements set forth in this chapter including, but not limited to, mitigation requirements and the following standards:
    1. A buffer shall be established from all edges of the steep slope hazard area. The size of the buffer or setback shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from slope instability, landsliding or erosion caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. In no instance shall the minimum buffer be less than 10 feet. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet;
    2. Buffers for steep slope hazard areas shall not be subject to provisions for buffer averaging; and
    3. Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a steep slope hazard area or buffer shall be prohibited.

Response to Code Requirement: For this review, steep slopes were assigned a 50-foot-wide buffer. No pole replacement activities will occur in the steep slopes mapped within the existing utility corridor; however, a single pole is proposed to be installed within a steep slope buffer south of May Creek. The proposed project includes limited vegetation management, tree removal and tree trimming, within steep slope buffer areas (which is an allowed alteration for public utility corridors with the approval of permits). Even with the proposed vegetation management, the existing utility corridor still provides a substantial tree cover when compared to the mowed pipeline right-of-way that, based on our observations, has not impacted steep slope hazards or buffers. Mitigation measures will be used to reduce potential impacts to steep slope hazard area buffers.

B. Alterations to steep slope hazard areas and buffers may be allowed pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, only as follows:

1. Surface water conveyances if the department finds that:

    a. The conveyance is installed in a manner to minimize disturbance to the slope and vegetation;

    b. Discharging the surface water at the base of the steep slope hazard area has less adverse impact upon the critical area than if the surface water were dispersed at the top of the slope; and

    c. Adverse impacts to fish are minimized, to the maximum extent possible, by maintaining the prealteration groundwater volume to support fish habitat in receiving water bodies.

2. Public and private trails as long as no trails are constructed of impervious surfaces which will contribute to surface water runoff, unless such construction is necessary for soil stabilization or soil erosion prevention or unless the trail system is specifically designed and intended to be accessible to handicapped persons. Trail construction shall be in compliance with adopted trail standards.

3. Public and private utilities and utility corridors if the applicant shows that:

    a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

    b. Vegetation removal is limited to the minimum necessary to locate the utility or construct the corridor.

4. Normal and routine maintenance of existing public and private utility facilities and utility corridors if the applicant shows that:

    a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and

    b. Vegetation removal for the purpose of utility and corridor maintenance is the minimum necessary to maintain the utility's function.

5. Vegetation removal activities, as follows:

    a. The removal of noxious weeds;

    b. The removal of vegetation, only as necessary for surveying purposes; and

    c. The removal of hazard trees, as determined by the city.

6. Stabilization of sites where erosion or landsliding threatens preexisting public or private structures, utilities, roadways, driveways or trails or where erosion or landsliding threatens any lake, stream, wetland or shoreline. Stabilization work shall be performed in a manner which causes the least possible disturbance to the slope and its vegetative cover.
7. Point discharges from surface water facilities onto or upstream from steep slope hazard areas that are also erosion hazard areas shall be prohibited except as follows:
    a. Conveyed via continuous storm pipe downslope to a point where there are no erosion hazard areas downstream from the discharge;
    b. Discharged at flow durations matching predeveloped conditions, with adequate energy dissipation, into existing channels that previously conveyed stormwater runoff in the predeveloped state; and
    c. Dispersed discharge upslope of the steep slope onto a low-gradient undisturbed buffer demonstrated to be adequate to infiltrate all surface and stormwater runoff.
8. Exploratory drilling and testing, involving only necessary and limited clearing and grading, for the purpose of preparing critical area reports.
9. The application of herbicides or other hazardous substances, if necessary, as approved by the department.

Response to Code Requirement: The proposed development includes vegetation management (tree removal and trimming), pole installation, and construction access within an existing utility right-of-way. However, none of these activities will occur within the mapped steep slope hazard areas; as such no alterations to steep slopes are proposed. However, one pole is proposed to be placed in a steep slope buffer south of May Creek. In our opinion, the proposed alterations to steep slope hazard buffers will not subject the critical area to an increased risk of landslide or erosion, and vegetation removal is limited to the minimum necessary to maintain the utility corridor. Tree removal and trimming will be followed by mitigation measures to reduce potential impacts to slope stability in steep slope areas and steep slope buffer zones. Mitigation measures include a variety of BMPs to reduce potential impacts steep slope areas and slope stability on contiguous properties. BMPs include, but are not limited to: minimum removal necessary to maintain utility corridor's function, tree/vegetation replacement, scattering trimmed or removed tree debris, chipping wood to reduce potential impacts to work areas as appropriate, reseeding, and mulching disturbed areas.

LIMITATIONS

We have prepared this report for the exclusive use of PSE and their authorized agents for the Energize Eastside project located in Newcastle, Washington.

The purpose of our services was to review slope stability and landslide hazard impacts in relation to vegetation management, tree removal, and tree trimming and temporary access routes (associated with the proposed pole replacement activities) in steep slope and landslide critical hazard areas along the transmission line corridor within the City of Newcastle. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

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Memorandum

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To: Kelly Purnell, Puget Sound Energy

From: Elson "Chip" Barnett, LG, LEG,
Galan W. McInelly, LG, LEG, LHG

Date: November 7, 2017

File: 0186-871-06

Subject: Evaluation of Mapped Steep Slope Areas, Energize Eastside, Newcastle, Washington

State of Washington
Engineering Geologist
620
Licensed Geologist
Galan W. McInelly

GeoEngineers, Inc. (GeoEngineers) is pleased to present this addendum memorandum to our Critical Areas Report (September 21, 2017) with the results for targeted critical areas evaluation of specific geologic hazards requested by Puget Sound Energy (PSE) for the Energize Eastside Project. Specifically, PSE requested that GeoEngineers provide an opinion regarding three mapped steep slopes outside of the Critical Area Study Limit that are greater than 40 percent as identified by maps provided by The Watershed Company (TWC) on November 1, 2017. In our September report we prioritized those Critical Areas within the study area. This memorandum includes an opinion regarding the mapped slopes greater than 40 percent shown in red shaded areas on WTC Figures 3 through 5.

Figure 3

The mapped narrow (less than 5 feet wide) 30-foot-long area west of the Critical Area Study Limit was reviewed using King County iMap for aerial photographs from 1936, 1998, 2000, 2002, 2005, 2013, 2015 and LiDAR data. The area is interpreted as a narrow ditch or drainage feature that is not within the project area. The tree proposed for removal near this feature is outside the buffer of the mapped steep slope area. In our opinion the proposed project activities will not adversely impact the mapped steep slope area.

Figure 4

The mapped (approximate 20- by 30-foot) area west of the Critical Area Study Limit was reviewed using King County iMap review of aerial photographs from 1936, 1998, 2000, 2002, 2005, 2013, 2015 and LiDAR data and by completing a site reconnaissance on November 2, 2017. The mapped area includes slopes that range from greater than 40 percent to approximately 60 percent adjacent to a residence to the west and upslope of the managed right of way as shown in Figure 4. The steep slope is vegetated with several 20- to 30-inch-diameter Douglas fir trees in vertical growth position. We observed no indication of slope movement and in our opinion the proposed site activity and limited tree removal will not impact the mapped steep slope area.

Figure 5

The mapped narrow 190-foot-long area east of the Critical Area Study Limit was reviewed using King County iMap for aerial photographs from 1936, 1998, 2000, 2002, 2005, 2013, 2015 and LiDAR data. The area is interpreted as a constructed rockery that was part of the residential development at the corner of SE May Creek Park Drive and 129th Avenue SE. The rockery was constructed after 2009 based on aerial photograph review. The rockery is not considered a native steep slope area susceptible to typical hillslope

processes. Nevertheless, no tree removal or site activity is planned within the buffer associated with the rockery and in our opinion the proposed project activities will not adversely impact the mapped steep slope area.

Summary

We re-evaluated the three mapped slopes and recommend removal of these steep slope areas from further impact discussion relative to the Energize Eastside project. There are no proposed activities within the mapped steep slope areas. In our opinion the proposed project activities will have no adverse impact on these steep slopes or their buffers.

APPENDIX D

Detailed CAIA Methodology

This detailed Critical Area Impact Analysis (CAIA) is intended to further describe the methods used to generate critical area features and existing land cover classes used in conjunction with PSE site plans in order to quantify impacts resulting from implementation of the Energize Eastside Project. This Appendix is meant to complement and expand upon the methods described in the body of the report.

Methodology Outline:

- Critical Area Delineation and Mapping Methods
  - Wetlands
  - Streams
  - Functioning Wetland and Stream Buffers
  - Geologic Hazard Area Buffers
- Existing Land Cover Mapping
  - Vegetation Assessment Methods
- Impact Characterization
- Critical Areas Impact Assessment
- Quality Assurance Review of Analysis Steps and Results
- Limitations
- Data Sources Table

Critical Area Delineation and Mapping Methods

Wetland and stream critical areas were delineated and classified by The Watershed Company between March and October 2015 coincident with the field work for vegetation inventory analysis. These delineated features were GPS-located.

Critical area features not delineated in the field were mapped using publicly-available GIS data. A table provided at the end of this document lists data sources for each mapped critical area.

Wetland Delineation

The study area was evaluated for wetlands using methodology from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Regional Supplement) (US Army Corps of Engineers [Corps] May 2010). Wetland boundaries were determined on the basis of an examination of vegetation, soils, and hydrology. Areas meeting the criteria set forth in the Regional Supplement were determined to be wetland. Soil, vegetation, and hydrologic parameters were sampled at several locations along the wetland boundary to make the determination.

Identified wetlands have been classified using the *2014 Update to the Western Washington Wetland Rating System* (Ecology publication #14-06-029) per Newcastle regulations.

Stream Delineation

The study area was also evaluated for streams based on the presence or absence of an ordinary high water mark (OHWM) as defined by the Revised Code of Washington (RCW) 90.58.030 and the Washington Administrative Code (WAC) 220-660-030. The OHWM edge was located by examining the bed and bank physical characteristics and vegetation.

The centerlines of streams in the study area were recorded in the field, with stream widths approximated in the field and based on aerial photometry and elevation contours. Streams were classified according to the City of Newcastle Municipal Code.

Functioning Wetland and Stream Buffers Mapping

Standard buffers were applied to delineated wetland and stream edges in GIS according to regulatory buffer widths in Newcastle Municipal Code. In some cases, developed areas intruded into these mapped standard buffers. To remove these non-functioning buffer areas from the assessment of Project impacts, developed areas (see land cover mapping section) were manually removed from the standard buffer polygons in GIS (based on observed field conditions and

recent aerial photography). The resulting functioning buffers were used to determine buffer impacts and mitigation needs.

Geologic Hazard Areas and Buffers Mapping

Three regulated geologic hazard area types occur within the Project corridor in the city of Newcastle including erosion hazards areas, landslide hazards areas, and steep slopes hazard areas. According to Newcastle Municipal Code, and the GeoEngineers Report (Appendix C), landslide hazard areas and steep slopes require 50-foot buffers from all edges, while no buffer is applied to erosion hazard areas.

Geospatial inventories of erosion and landslide hazards areas that are published by King County GIS and encompass the city of Newcastle, were used for this effort. To generate required landslide hazard buffers, The Watershed Company applied a 50-foot buffer to features in the King County geospatial inventory that occur along the Project corridor. The dataset was then clipped to the 500-foot study corridor.

Lacking a publicly-available inventory of steep slope features within the city of Newcastle, The Watershed Company generated steep slope hazard area data using high-resolution LIDAR data provided by PSE that represents the bare earth topographic surface for the greater study area. Topographic surface data was analyzed to identify and isolate areas where the slope of the ground surface is 40 percent or steeper. Features were then reanalyzed to identify and isolate slopes with an elevation change of at least 10 feet of vertical relief. A 50-foot buffer was then applied to these steep slope hazard area features. The dataset was then clipped to the 500-foot study corridor.

Existing Land Cover Mapping

In order to quantify land cover changes from Project-related activities, a layer showing existing land use was created to describe the current land cover conditions. The land cover base map was developed from the following existing data sources:

- 2009 Impervious and Impacted Surface raster data set, King County GIS
- Energize Eastside Corridor digital survey, APS Surveying
- Energize Eastside Corridor Tree Inventory data, The Watershed Company
- Energize Eastside Corridor Vegetation Polygon data, The Watershed Company
- Energize Eastside Corridor Wetland and Stream Inventory, The Watershed Company
- High-resolution aerial photography, PSE, captured in 2011
- 2015-2016 aerial photography, King County GIS

Using the King County impervious surface raster, GIS analysts supplemented the mapped features using digital survey data. These data were further refined by manually reviewing mapped features against high-resolution aerial photography and field-verified conditions. After developed and non-developed areas were mapped, vegetation and tree canopy coverage information were integrated (described in following subsection), as well as mapped open water areas (streams). This effort yielded a base map with six general land cover types:

- Forested with understory vegetation
- Forested without understory vegetation
- Understory vegetation, unforested
- Other (generally lawn)
- Developed
- Water

Vegetation Assessment Methods

A full description of the vegetation analysis methods, the results of which have been incorporated into the CAIA, is presented in the *City of Newcastle Tree Inventory Report: Puget Sound Energy – Energize Eastside Project* (The Watershed Company 2016b). The ways in which the results were used to generate the mapped features presented in the CAIA are summarized below.

The Watershed Company certified arborists conducted a field-based vegetation inventory from March 23, 2015, to November 9, 2015 associated with potential routes for the Energize Eastside Project. The methodology utilized during the inventory was developed to comprehensively identify, describe, and mark all vegetation greater than 15 feet tall, or that had the potential to reach a mature height of 15 feet or taller.

Inventoried vegetation was mapped as points and/or polygons. Any tree with a diameter of six inches at four-and-a-half feet above the ground surface (DBH) was mapped as a point and tagged with a unique number and its attributes were recorded. Landscaped vegetation with the potential to reach 15 feet or greater was also inventoried in this manner regardless of size. Finally, weedy vegetation (*i.e.*, from seed [not planted] and not maintained) with a DBH of three to six inches was also inventoried in this way. This type of inventoried vegetation was typically survey-located.

In some instances, The Watershed Company certified arborists could not access or did not inventory vegetation that was previously or subsequently picked up by survey crews. This limitation was caused by a number of reasons that include a change in property access permissions; survey crew assessment limits as compared to the tree inventory study area; and/or the species, size, or condition of the tree or large shrub in question. Vegetation that was survey-located but not

inventoried by arborists has been incorporated into the CAIA analysis with a presumed maximum potential height of 25 feet and radius of 9 feet, as a rule. However, the attribute data associated with the survey-located only vegetation has not been collected.

Hedges and small weedy vegetation (less than three inches DBH) were mapped as polygons, not points. Polygons were sketched in the field based on observations then digitized in GIS using high-resolution imagery. Vegetation attributes within polygons were averaged. No significant (regulated) trees were inventoried using this method.

Resulting mapped features included in land cover mapping of the CAIA are vegetation points with the recorded canopy (or radius) applied creating circular "tree footprints" and polygons representing varying densities of smaller weedy vegetation with the potential to reach a height of 15 feet or more.

Using inventoried tree point data and incorporation of 3D design data depicting proposed pole heights and vertical wire alignment, tree impacts related to the construction of the Energize Eastside Project were quantified. Canopy cover for the anticipated trees to remain and trees to be removed or maintained was then mapped and overlayed, resulting in a polygon layer depicting the extent of anticipated canopy preservation and canopy loss. This data was incorporated into the land cover data, further refining existing land cover into eight general land cover types:

- Forested to be removed (canopy loss) with understory
- Forested to be removed, no understory
- Forested to remain (canopy preservation) with understory
- Forested to remain, no understory
- Understory vegetation, unforested
- Other (generally lawn)
- Developed
- Water

Impact Characterization

Proposed development areas associated with the Energize Eastside Project were mapped using geometry from design files and data provided by PSE. As described by PSE, work proposed in Newcastle could be classified into eight types and maintained in the long term as described in the following table.

Proposed Work	Long term Condition
Pole footprint	Developed

Pole buffer, describes an approximate 6-foot buffer around the proposed poles that will be disturbed during construction and tree growth will be managed long-term	Mixed Vegetation (Height maintained at 15 feet or where 20 feet of vertical clearance is provided beneath the vertical curvature of the lowest wire)
Access route, describes approximate path used during construction activities	Mixed Vegetation (Height may be maintained depending upon location relative to wire alignment)
Stringing sites*	Mixed Vegetation (Height may be maintained depending upon location relative to wire alignment)
Wire zone (WZ)	Mixed Vegetation (Height maintained at 15 feet or where 20 feet of vertical clearance is provided beneath the vertical curvature of the lowest wire)
Managed right-of-way (MROW)	Mixed Vegetation (Height maintained at 15 feet or where 20 feet of vertical clearance is provided beneath the vertical curvature of the lowest wire)
Pole work area, approximate temporary disturbance related to pole construction	Mixed Vegetation (Height may be maintained depending upon location relative to wire alignment)
Maintained legal right-of-way (LROW), encompasses the areas of LROW where PSE intends to exercise long-term vegetation management	Mixed Vegetation (Height maintained at 70 feet)
* Note: Impacts from stringing sites are captured within the footprints of other proposed work activities. During construction work associated with stringing sites, adjustments may be made in the field to avoid, minimize, or mitigate impacts should they occur.	

These proposed work areas were then intersected with the land cover data set described above. The result was a set of polygons defining pre-Project conditions (land cover data set values) and post-Project conditions (proposed work and long-term condition values). Differences between post-Project conditions and pre-Project conditions, or impacts, were then characterized as one of four types – permanent, conversion, temporary, or no change – based on the nature of the change on the ground. These characterization types are defined in the matrix below.

			Existing Land Cover Types							
	Impact Description	**Long-term Condition[1]**	Forested to be removed with understory	Forested to be removed, no understory	Forested to remain with understory	Forested to remain, no understory	Understory	Other (mostly lawn)	Developed	Water
Proposed Activities	Pole footprint	Developed	P	P	P	P	P	P	NC	N/A
	Pole buffer	Mixed vegetation[2]	C	C	T	T	T	T	NC	N/A
	Access route	Mixed vegetation[2]	C	C	T	T	T	T	NC	N/A
	Pole work area	Mixed vegetation[2]	C	C	T	T	T	T	NC	N/A
	Wire zone	Mixed vegetation[2]	C	C	NC	NC	NC	NC	NC	N/A
	Managed ROW	Mixed vegetation[2]	C	C	NC	NC	NC	NC	NC	N/A
	Maintained Legal ROW	Mixed vegetation[2]	C	C	NC	NC	NC	NC	NC	N/A

Type of Impact based on proposed activity, long term condition, and existing land cover type:

P = Permanent to developed C = Vegetation conversion (not developed)

T = Temporary impact, can be restored to existing land cover

NC = No Change N/A = Not applicable/does not occur

[1] Long term condition determined in coordination with PSE.

[2] Subject to varying height restrictions described in Section 3.3.4.

Critical Areas Impact Assessment

Application of the matrix, yielded a map showing a full characterization of permanent, conversion, and temporary impacts associated with the Energize Eastside Project. This impact characterization layer was then intersected with each individual mapped critical area in order to locate, characterize, and quantify impacts to that critical area. The results were summarized by critical area, and for wetlands and streams, by drainage sub-basin.

The ending table summarizes the data sources used for the critical areas analysis.

Quality Assurance Review of Analysis Steps and Results

Internal review of CAIA steps and results has occurred throughout the process described above and will be ongoing as the analysis is refined.

Ecologists, arborists, GIS analysts, and planners worked collaboratively to ensure all appropriate critical areas were incorporated into the maps and where appropriate, classified and buffered according the local jurisdiction regulations.

GIS analysts created the land cover base map, compiled from a variety of sources. Land cover classifications were reviewed for quality assurance first through the GIS department by comparing mapped data to high resolution aerial imagery. Following review by the GIS analysts, the land cover map was reviewed by an ecologist against delineation field notes and recollections from field work activities.

Project elements and site plans have been provided by, and reviewed with, PSE Project staff. The mapped location and long-term condition of Project elements is based upon discussions with PSE regarding BMPs and standard PSE programs and policies.

All components of the CAIA have been generated/authored by reputable sources and have been cross-checked internally for consistency. Quantified and depicted impacts resulting from the CAIA have been reviewed by ecologists for quality assurance to the extent feasible. Impact results will continue to be reviewed for accuracy as the Project plans and impact areas are refined and finalized.

Limitations

This analysis relies on a series of data products produced using different scales and methods; therefore, mapped features may not align with the planned real-world layout of proposed corridor facilities. Ground-truthing of these results may reveal inaccuracies. Furthermore, as some features and design geometries were translated from AutoCAD into ArcGIS, some geometric refinements were necessary to address gaps and other issues, which could affect the accuracy of the analysis results.

Data Inventory Elements and Information Sources:

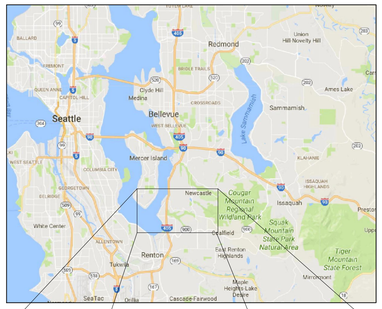
Inventory Element	Information Gathered	Data Source(s)	Assumptions/Limitations
Proposed Development			
Topographic surface data	• Point map of surface elevations	Puget Sound Energy (PSE) tabular data (via email R. Weider); date received 4/19/2017 The Watershed Company (TWC)	• Point elevations generated from LIDAR flight by consultant to PSE; flight date unknown • Data was post-processed to generate a 3D surface map using ArcGIS software
Proposed Energize Eastside Project Improvements	• Pole structures • Wire alignments, including alternate alignment • Pole construction work areas • Proposed temporary construction access routes • Stringing sites	PSE (via email R. Weider, K. Purnell), design drawings in AutoCAD; date received: 7/20/2017-10/10/2017 HDR (via email K. Purnell), geospatial data; date received 8/2/2017 TWC	• Reflects pole and wire design configuration from June 30, 2017, with updates through Oct 10, 2017; includes possible non-variance configuration through Newcastle • Design may be subject to revision or update based on regulatory comments, field conditions, or other factors
Cadastral Datasets & Features			
Land Cover	• Development and impervious areas • Other • Tree canopy • Understory vegetation	King County 2009 impervious dataset and 2015-2016 aerial data PSE high-resolution aerial photography; date received 7/7/2015 APS Surveying, digital survey TWC	• Impervious dataset from King County, last updated 2009 • Vegetation survey by TWC between 2015 and 2017 • “Developed” category includes roads, structures, and heavily disturbed areas, such as compacted unimproved roadways • “Other” category observed to be mostly lawn based on visual observation of aerial photographs, but could include other conditions • Survey data was post-processed to isolate and generate geospatial feature classes using ArcGIS software

Parks	• Park locations	City of Bellevue King County	• Bellevue last updated on 02-06-2017 • King Co last updated 07-19-2016
City limits	• Shapefile polygons	King County (downloaded 4/19/2017) City of Newcastle (downloaded 4/23/2017)	• Does not reflect annexations beyond download date.
Parcels	• Shapefile polygons	King County (downloaded 4/19/2017) City of Newcastle (downloaded 4/23/2017)	• Does not reflect parcel subdivisions beyond download date.
Regulated Critical Areas			
Streams and Riparian Areas (NMC 18.24.306)	• Streams with study corridor • Stream buffers	TWC City of Newcastle (downloaded 4/23/2017)	• Streams delineated by TWC between 2015 and 2017 • Feature buffers assigned according to City of Newcastle 2017 Critical Areas Ordinance (CAO)
	• Floodplains	*See Flood Hazard Areas*	
Wetlands (NMC 18.24.312)	• Delineated wetlands within study corridor • Wetland buffers	TWC City of Newcastle GIS	• Wetlands delineated by TWC between 2015 and 2017 • Wetland feature ratings based on 2014 rating system • Feature buffers assigned according to City of Newcastle 2017 Critical Areas Ordinance (CAO)
Fish and Wildlife Habitat Conservation Areas (NMC 18.24.302)	• Priority habitat and species data (PHS) • Endangered/listed species	WDFW (received 6/27/2017) USFWS	• No FWHCA features occur within project area • Scale may not be sufficient to capture individual occurrences or observations along the corridor. • Accuracy does not supersede observation by PSE staff.
Geologic Hazard Areas:	• Landslide hazard areas • Landslide hazard buffers	King County (downloaded 6/15/2017)	• Data describes landslide hazards defined by King County SAO

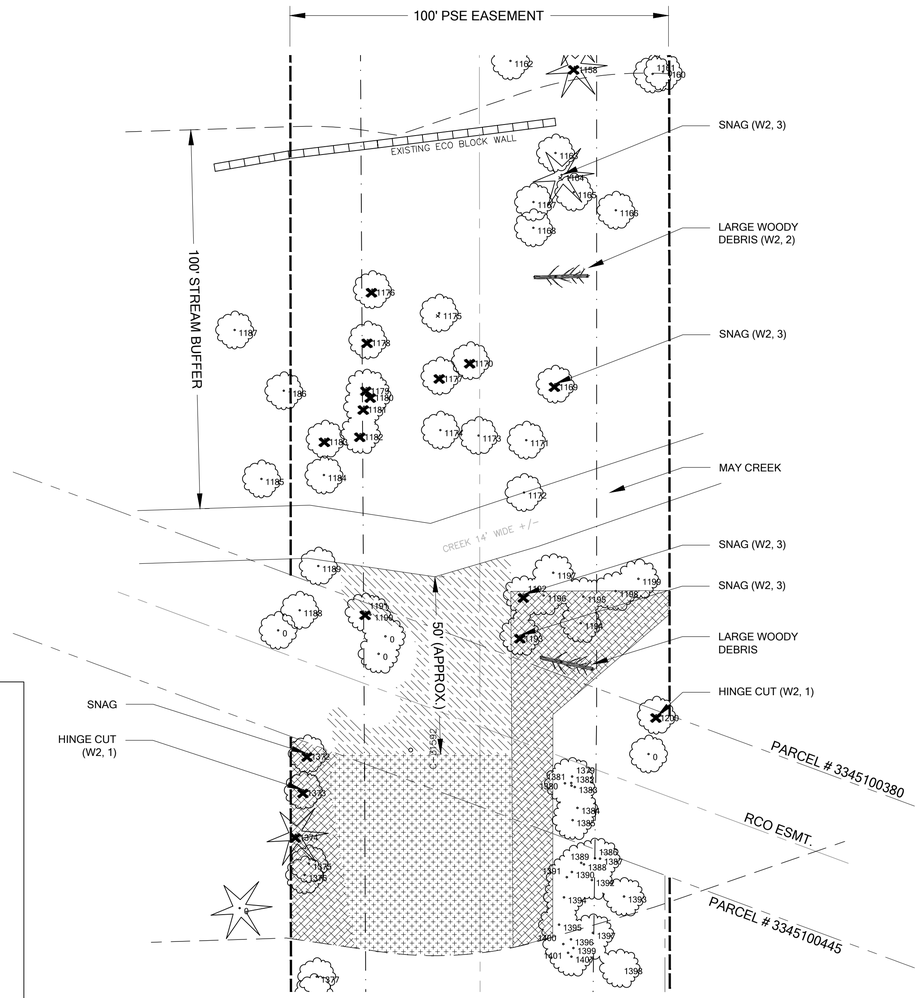
• Landslide hazard areas (NMC 18.24.270) • Erosion hazard areas (NMC 18.24.210) • Steep slope hazard area (NMC 18.24.300) • Coal mine hazard areas (NMC 18.24.200) • Seismic hazard areas (NMC 18.24.280)		TWC	• Data is not suitable for smaller scale site-specific analysis; "Observation of actual on-site conditions is required to determine if a particular parcel is in a landslide hazard area or not." • Feature buffers assigned according to City of Newcastle 2017 Critical Areas Ordinance (CAO)
	• Erosion hazard areas	King County (downloaded 4/19/2017)	• Data describes erosion hazards defined by King County SAO • Data is not suitable for smaller scale site-specific analysis
	• Steep slope hazard area • Steep slope buffers	TWC GeoEngineers	• TWC generated steep slope data through analysis of PSE LIDAR surface data. Areas meeting steep slope definition, specifically, where slope >= 40% and >10 ft of relief. • After steep slope areas were identified, a 50 ft buffer was generated. Feature buffers assigned according to City of Newcastle 2017 Critical Areas Ordinance (CAO).
	• Coal mine hazard areas	King County (downloaded 6/15/2017)	• No features occur within project area
	• Seismic hazard areas	King County (downloaded 6/15/2017)	• No features occur within project area
Flood Hazard Areas (NMC 18.24.260)	• Flood hazard areas	King County (downloaded 6/15/2017) FEMA	• No features occur within project area

APPENDIX E

Mitigation Plans



VICINITY MAP



TREE TAG NUMBER	COMMON NAME	SCIENTIFIC NAME	NO. OF STEMS	DBH (IN)	CONDITION	TREATMENT
1161	Bigleaf maple	*Acer macrophyllum*	2	3.2	2 - Good	Retain
1163	Bigleaf maple	*Acer macrophyllum*	1	8.9	2 - Good	Retain
1164	Douglas-fir	*Pseudotsuga menziesii*	1	25.5	5 - Dead/Dying	SNAG
1165	Bigleaf maple	*Acer macrophyllum*	2	6.2	2 - Good	Retain
1166	Bigleaf maple	*Acer macrophyllum*	2	10.4	2 - Good	Retain
1167	Bigleaf maple	*Acer macrophyllum*	4	7.6	2 - Good	Retain
1168	Bigleaf maple	*Acer macrophyllum*	1	3	3 - Fair	Retain
1169	Red alder	*Alnus rubra*	1	8.2	2 - Good	SNAG
1170	Red alder	*Alnus rubra*	1	6.4	2 - Good	REMOVE
1171	Red alder	*Alnus rubra*	1	4.1	2 - Good	Retain
1172	Red alder	*Alnus rubra*	1	5.3	2 - Good	Retain
1173	Vine maple	*Acer circinatum*	1	3.1	2 - Good	Retain
1174	Vine maple	*Acer circinatum*	7	3.4	2 - Good	Retain
1175	Red alder	*Alnus rubra*	1	3.2	2 - Good	REMOVE
1176	Red alder	*Alnus rubra*	1	6.5	2 - Good	REMOVE
1177	Red alder	*Alnus rubra*	1	7.1	2 - Good	REMOVE
1178	Red alder	*Alnus rubra*	2	4	2 - Good	REMOVE
1179	Red alder	*Alnus rubra*	1	4.9	2 - Good	REMOVE
1180	Red alder	*Alnus rubra*	1	6.4	2 - Good	REMOVE
1181	Red alder	*Alnus rubra*	1	6.4	2 - Good	REMOVE
1182	Red alder	*Alnus rubra*	1	5.5	2 - Good	REMOVE
1183	Red alder	*Alnus rubra*	1	3	2 - Good	REMOVE
1184	Red alder	*Alnus rubra*	1	3.3	2 - Good	Retain
1185	Red alder	*Alnus rubra*	1	4.5	2 - Good	Retain
1186	Red alder	*Alnus rubra*	1	3.2	3 - Fair	Retain
1187	Sitka willow	*Salix sitchensis*	2	2.4	2 - Good	Retain
1188	Sitka willow	*Salix sitchensis*	1	2.6	2 - Good	Retain
1189	Red alder	*Alnus rubra*	1	6.6	2 - Good	Retain
1190	Redosier dogwood	*Cornus sericea*	2	2.5	3 - Fair	Retain
1191	Red alder	*Alnus rubra*	1	3.4	2 - Good	REMOVE
1192	Red alder	*Alnus rubra*	1	6.9	2 - Good	SNAG
1193	Red alder	*Alnus rubra*	1	7.2	2 - Good	SNAG
1194	Red alder	*Alnus rubra*	1	3.2	3 - Fair	Retain
1195	Red alder	*Alnus rubra*	1	8.2	2 - Good	Retain
1196	Red alder	*Alnus rubra*	1	4.6	2 - Good	Retain
1197	Red alder	*Alnus rubra*	1	5.3	2 - Good	Retain
1198	Red alder	*Alnus rubra*	1	5.7	2 - Good	Retain
1199	Red alder	*Alnus rubra*	1	4.3	2 - Good	Retain
1200	Red alder	*Alnus rubra*	1	5	2 - Good	HINGE-CUT
1372	Red alder	*Alnus rubra*	1	6.5	2 - Good	SNAG
1373	Red alder	*Alnus rubra*	1	4.1	2 - Good	HINGE-CUT
1374	Western red cedar	*Thuja plicata*	1	2.3	2 - Good	REMOVE
1375	Bigleaf maple	*Acer macrophyllum*	2	36	3 - Fair	Retain
1376	Bigleaf maple	*Acer macrophyllum*	1	4.7	3 - Fair	Retain
1379	Bigleaf maple	*Acer macrophyllum*	1	3.1	3 - Fair	Retain
1380	Bigleaf maple	*Acer macrophyllum*	1	3.4	3 - Fair	Retain
1381	Bigleaf maple	*Acer macrophyllum*	1	4.9	3 - Fair	Retain
1382	Bigleaf maple	*Acer macrophyllum*	1	7.4	3 - Fair	Retain
1383	Bigleaf maple	*Acer macrophyllum*	1	4.2	3 - Fair	Retain
1384	Bigleaf maple	*Acer macrophyllum*	1	5.2	3 - Fair	Retain
1385	Bigleaf maple	*Acer macrophyllum*	1	4	3 - Fair	Retain
1386	Bigleaf maple	*Acer macrophyllum*	1	3.6	3 - Fair	Retain
1387	Bigleaf maple	*Acer macrophyllum*	1	8.9	3 - Fair	Retain
1388	Bigleaf maple	*Acer macrophyllum*	1	8.4	3 - Fair	Retain
1389	Bigleaf maple	*Acer macrophyllum*	1	6.4	3 - Fair	Retain
1390	Bigleaf maple	*Acer macrophyllum*	1	4.3	3 - Fair	Retain
1391	Bigleaf maple	*Acer macrophyllum*	1	8.6	3 - Fair	Retain
1392	Bigleaf maple	*Acer macrophyllum*	1	14.2	3 - Fair	Retain
1393	Bigleaf maple	*Acer macrophyllum*	1	9.5	3 - Fair	Retain
1394	Bigleaf maple	*Acer macrophyllum*	1	5.2	3 - Fair	Retain
1395	Bigleaf maple	*Acer macrophyllum*	1	6.6	3 - Fair	Retain
1400	Bigleaf maple	*Acer macrophyllum*	1	4	3 - Fair	Retain

LEGEND

- APPROXIMATE PARCEL BOUNDARY
- 100' PSE EASEMENT
- EASEMENT CENTERLINE
- STREAM BUFFER (100-FT)
- MAY CREEK STREAM BOUNDARY (APPROX.)
- OPL EASEMENT BOUNDARY (APPROX.)
- EXISTING TREES
- TREES TO BE REMOVED, SNAGGED OR HINGED

MAY CREEK CANDIDATE PLANT SCHEDULE

SHRUB MIX	2,282 SF	SIZE
CORNUS SERICEA / RED TWIG DOGWOOD		1 GALLON
CORYLUS CORNUTA / BEAKED HAZELNUT		1 GALLON
GAULTHERIA SHALLON / SALAL (GROUNDCOVER)		1 GALLON
MAHONIA AQUIFOLIUM / OREGON GRAPE		1 GALLON
OEMLERIA CERASIFORMUS / OSOBERRY		1 GALLON
POLYSTICHUM MUNITUM / SWORD FERN (GROUNDCOVER)		1 GALLON
SAMBUCUS RACEMOSA / RED ELDERBERRY		1 GALLON
SYMPHORICARPOS ALBUS / COMMON WHITE SNOWBERRY		1 GALLON

MOWABLE HERBACEOUS POLLINATOR MIX A	2,380 SF	
ACHILLEA MILLEFOLIUM / COMMON YARROW		SEED MIX
DANTHONIA CALIFORNICA / CALIFORNIA OATGRASS		SEED MIX
DELPHINIUM MENZIESII / LARKSPUR		SEED MIX
ECHINACEA PURPUREA / PURPLE CONEFLOWER		SEED MIX
ERIOPHYLLUM LANATUM / WOOLLY SUNFLOWER		SEED MIX
ESCHSCHOLZIA CALIFORNICA / CALIFORNIA POPPY		SEED MIX
FESTUCA IDAHOENSIS ROEMERI / ROEMER`S FESCUE		SEED MIX
PRUNELLA VULGARIS / SELF-HEAL		SEED MIX
TRIFOLIUM INCARNATUM / CRIMSON CLOVER		SEED MIX

MOWABLE HERBACEOUS POLLINATOR MIX B	1,756 SF	
AQUILEGIA X / COLUMBINE		SEED MIX
ASTER SUBSPICATUS / DOUGLAS ASTER		SEED MIX
DESCHAMPSIA CESPITOSA / TUFTED HAIR GRASS		SEED MIX
ELYMUS GLAUCUS / BLUE WILDRYE		SEED MIX
GEUM MACROPHYLLUM / LARGE-LEAVED AVENS		SEED MIX
IRIS TENAX / OREGON IRIS		SEED MIX
LUPINUS POLYPHYLLUS / LARGE-LEAVED LUPINE		SEED MIX
MONARDA FISTULOSA / BERGAMOT		SEED MIX
SOLIDAGO CANADENSIS / GOLDENROD		SEED MIX
TELLIMA GRANDIFLORA / FRINGECUP		SEED MIX

SHEET INDEX

NOTES

1. PLEASE BE AWARE THAT CONSTRUCTION ACCESS, POLE TYPES, POLE HEIGHTS, AND POLE LOCATIONS ARE SUBJECT TO CHANGE PENDING FURTHER DESIGN, ENVIRONMENTAL REVIEW, PERMITTING AND IN-FIELD CONSTRUCTION NEEDS.

MAY CREEK

BUFFER MITIGATION PLAN

0 10' 20' 40' 80'

PERMIT SET

NOT FOR CONSTRUCTION

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland WA 98033

p 425.822.5242
www.watershedco.com

Science & Design

MAY CREEK
BUFFER MITIGATION PLAN
PREPARED FOR: PUGET SOUND ENERGY
ENERGIZE EASTSIDE
PARCELS #: 3345100380
NEWCASTLE, WA

SUBMITTALS & REVISIONS

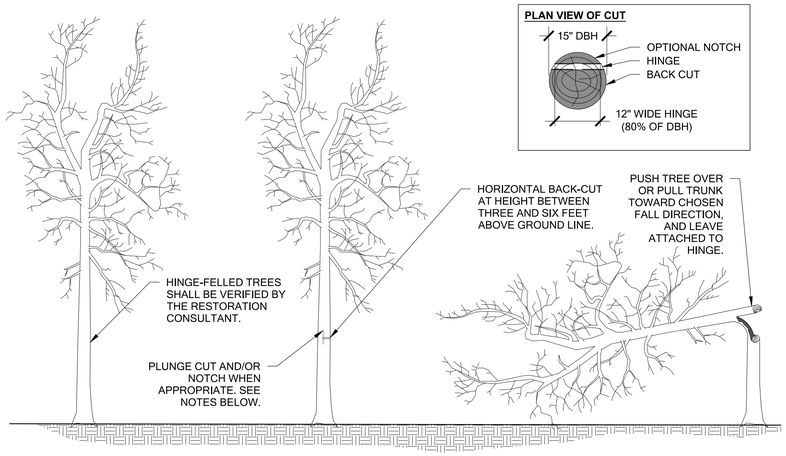
NO.	DATE	DESCRIPTION	BY
1	10-30-2017	BUFFER MITIGATION PLAN	LM/aj

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: JC
DESIGNED: LM / KC
DRAFTED: LM
CHECKED: JC / KC
JOB NUMBER:
111103.11

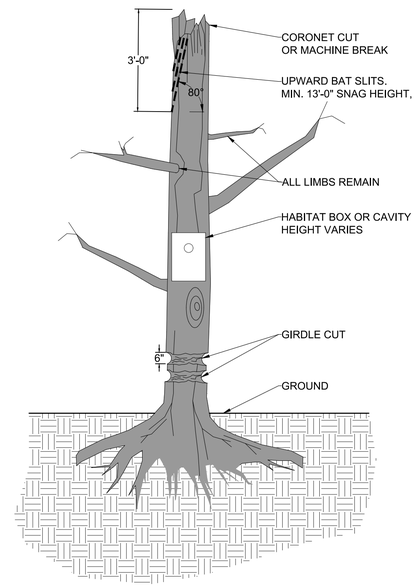
SHEET NUMBER:
W1 OF 4

FILENAME
PRINTED BY
DATE



NOTES:
1. SEE PLAN FOR LOCATION. VERIFY FALL DIRECTION IN FIELD WITH ASSISTANCE FROM THE RESTORATION CONSULTANT.
2. TREE SHALL HAVE PLIABLE WOOD AND A MAXIMUM DBH OF 15 INCHES.
4. USING ONLY A BACK CUT THAT DOES NOT FULLY SEVER THE TREE'S TRUNK FROM THE STUMP, LEAVE THE FALLEN TREE CONNECTED TO THE STUMP BY A "HINGE" OF BARK.
5. THE LENGTH OF THE HINGE SHOULD BE 80% OF THE DBH. VERIFY WITH RESTORATION CONSULTANT BASED ON SPECIES.
6. FOR LARGER DBH TREES, PENETRATE TRUNK WITH A VERTICAL PLUNGE CUT PRIOR TO HORIZONTAL BACK CUT, OR MAKE A SHALLOW NOTCH, 1-2 INCHES DEEP, ON THE SIDE OF THE TREE FACING ITS FALL DIRECTION.

1 / W2 HINGE CUT TREE
SCALE: NTS

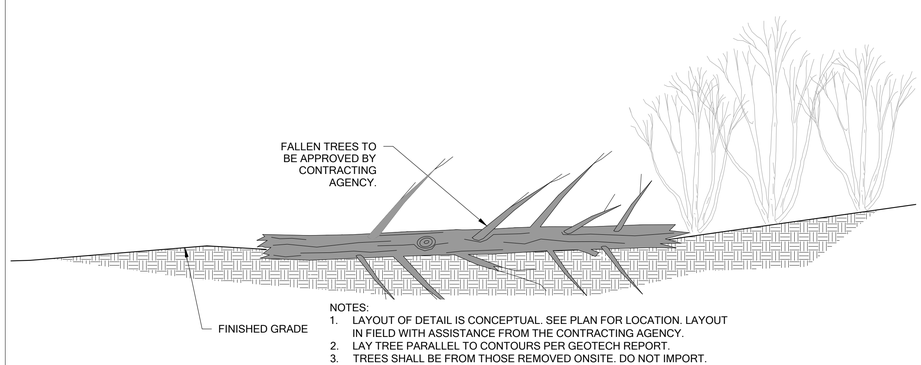


SNAG NOTES:
SEE TREE SNAG TABLE FOR TREES WHICH ARE TO BE RETAINED AS SNAGS. ALL TREES SHOULD BE:

1. SNAGS ON SITE ARE TO BE TOPPED BY CLIMBING ARBORIST OR BROKEN WITH MACHINE TO HEIGHT AS INDIVIDUALLY CONFIRMED ON TREE SNAG TABLE.
2. ONCE TOP HAS BEEN REMOVED ARBORIST IS TO MAKE A CORONET CUT TO GIVE A NATURAL BREAK APPEARANCE IF BROKEN BY MACHINE CORONET CUT IS NOT NECESSARY.
3. HABITAT BOXES ARE TO BE MOUNTED TO A MINIMUM OF 12' FROM THE GROUND.
4. RETAIN ALL BRANCHES FOR PERCHES AND HABITAT STRUCTURES- DO NOT LIMB.
5. LIVE TREES SHOULD BE DEADENED BY CUTTING TWO 6" WIDE, ANGLED BANDS AROUND THE BASE OF THE TREE WITH AN AXE OR BY MAKING TWO CUTS AROUND THE TREE WITH A CHAIN SAW TO A DEPTH OF APPROXIMATELY 1 INCH BELOW THE BARK LAYER.
6. WATERSPOUTS MAY DEVELOP BELOW GIRDLING CUT DEPENDING ON SPECIES. THESE SHOULD BE REMOVED WITH ROUTINE MAINTENANCE AND MONITORING.

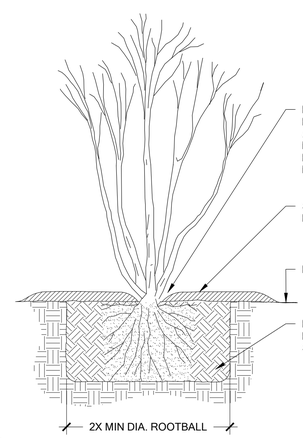
BAT ROOSTING SLIT NOTES
1. TO MAKE BAT ROOSTING CUTS, BEGIN APPROXIMATELY 3'-0" BELOW CORONET CUT AT TOP OF SNAG. AT AN ANGLE OF 80 DEGREES TO THE GROUND, CUT INTO TREE TRUNK WITH AN UPWARD SLANT. MAKE 3 PARALLEL CUTS, APPROXIMATELY 2'-0" DEEP.
2. FACE OF BAT ROOST SLITS ARE TO FACE EAST OR SOUTH DEPENDING ON AVAILABILITY OF SUNLIGHT IN THE MORNING HOURS.
3. TO DETER SPECIES SUCH AS WASPS FROM INHABITING ROOST AREAS IT IS RECOMMENDED THAT CUTS BE MADE TO A THICKNESS OF 3/4".

3 / W2 STANDING SNAG
SCALE: NTS



NOTES:
1. LAYOUT OF DETAIL IS CONCEPTUAL. SEE PLAN FOR LOCATION. LAYOUT IN FIELD WITH ASSISTANCE FROM THE CONTRACTING AGENCY.
2. LAY TREE PARALLEL TO CONTOURS PER GEOTECH REPORT.
3. TREES SHALL BE FROM THOSE REMOVED ONSITE. DO NOT IMPORT.

2 / W2 HABITAT LOG
SCALE: NTS



NOTES:
1. PLANTING PIT SHALL NOT BE LESS THAN (2) TIMES THE WIDTH OF THE ROOT BALL DIA.
2. LOOSEN SIDES AND BOTTOMS OF PLANTING PIT
3. SOAK PLANTING PIT AFTER PLANTING

REMOVE FROM POT OR BURLAP & ROUGH-UP ROOT BALL BEFORE INSTALLING. UNTANGLE AND STRAIGHTEN CIRCLING ROOTS - PRUNE IF NECESSARY. IF PLANT IS EXCEPTIONALLY ROOT-BOUND, DO NOT PLANT AND RETURN TO NURSERY FOR AN ACCEPTABLE ALTERNATIVE

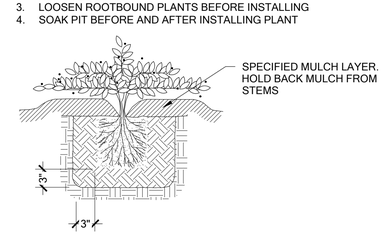
SPECIFIED MULCH LAYER. HOLD BACK MULCH FROM TRUNK/STEMS

FINISH GRADE

REMOVE DEBRIS AND LARGE ROCKS FROM PLANTING PIT AND SCARIFY SIDES AND BASE. BACKFILL WITH SPECIFIED SOIL. FIRM UP SOIL AROUND PLANT.

4 / W2 SHRUB PLANTING
SCALE: NTS

NOTES:
1. PLANT GROUNDCOVER AT SPECIFIED DISTANCE ON-CENTER (O.C.) USING TRIANGULAR SPACING, TYP.
2. LOOSEN SIDES AND BOTTOM OF PLANTING PIT AND REMOVE DEBRIS
3. LOOSEN ROOTBOUND PLANTS BEFORE INSTALLING
4. SOAK PIT BEFORE AND AFTER INSTALLING PLANT



5 / W2 GROUNDCOVER PLANTING
SCALE: NTS

PERMIT SET

NOT FOR CONSTRUCTION

MAY CREEK
LANDSCAPE CONSTRUCTION DETAILS

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
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MAY CREEK
BUFFER MITIGATION PLAN
PREPARED FOR: PUGET SOUND ENERGY
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PARCELS #: 3345100380
NEWCASTLE, WA

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	10-30-2017	BUFFER MITIGATION PLAN	LM/aj

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: JC
DESIGNED: LM / KC
DRAFTED: LM
CHECKED: JC / KC
JOB NUMBER:
111103.11
SHEET NUMBER:
W2 OF 4

FILENAME
PRINTED BY
DATE

PLANT INSTALLATION SPECIFICATIONS

GENERAL NOTES

QUALITY ASSURANCE
1. PLANTS SHALL MEET OR EXCEED THE SPECIFICATIONS OF FEDERAL, STATE, AND LOCAL LAWS REQUIRING INSPECTION FOR PLANT DISEASE AND INSECT CONTROL.
2. PLANTS SHALL BE HEALTHY, VIGOROUS, AND WELL-FORMED, WITH WELL DEVELOPED, FIBROUS ROOT SYSTEMS, FREE FROM DEAD BRANCHES OR ROOTS. PLANTS SHALL BE FREE FROM DAMAGE CAUSED BY TEMPERATURE EXTREMES, LACK OR EXCESS OF MOISTURE, INSECTS, DISEASE, AND MECHANICAL INJURY. PLANTS IN LEAF SHALL BE WELL FOLIATED AND OF GOOD COLOR. PLANTS SHALL BE HABITUATED TO THE OUTDOOR ENVIRONMENTAL CONDITIONS INTO WHICH THEY WILL BE PLANTED (HARDENED-OFF).
3. TREES WITH DAMAGED, CROOKED, MULTIPLE OR BROKEN LEADERS WILL BE REJECTED. WOODY PLANTS WITH ABRASIONS OF THE BARK OR SUN SCALD WILL BE REJECTED.
4. NOMENCLATURE: PLANT NAMES SHALL CONFORM TO FLORA OF THE PACIFIC NORTHWEST BY HITCHCOCK AND CRONQUIST, UNIVERSITY OF WASHINGTON PRESS, 1973 AND/OR TO A FIELD GUIDE TO THE COMMON WETLAND PLANTS OF WESTERN WASHINGTON & NORTHWESTERN OREGON, ED. SARAH SPEAR COOKE, SEATTLE AUDUBON SOCIETY, 1997.

DEFINITIONS
1. PLANTS/PLANT MATERIALS. PLANTS AND PLANT MATERIALS SHALL INCLUDE ANY LIVE PLANT MATERIAL USED ON THE PROJECT. THIS INCLUDES BUT IS NOT LIMITED TO CONTAINER GROWN, B&B OR BAREROOT PLANTS; LIVE STAKES AND FASCINES (WATTLES); TUBERS, CORMS, BULBS, ETC..; SPRIGS, PLUGS, AND LINERS.
2. CONTAINER GROWN. CONTAINER GROWN PLANTS ARE THOSE WHOSE ROOTBALLS ARE ENCLOSED IN A POT OR BAG IN WHICH THAT PLANT GREW.

SUBSTITUTIONS
1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN SPECIFIED MATERIALS IN ADVANCE IF SPECIAL GROWING, MARKETING OR OTHER ARRANGEMENTS MUST BE MADE IN ORDER TO SUPPLY SPECIFIED MATERIALS.
2. SUBSTITUTION OF PLANT MATERIALS NOT ON THE PROJECT LIST WILL NOT BE PERMITTED UNLESS AUTHORIZED IN WRITING BY THE RESTORATION CONSULTANT.
3. IF PROOF IS SUBMITTED THAT ANY PLANT MATERIAL SPECIFIED IS NOT OBTAINABLE, A PROPOSAL WILL BE CONSIDERED FOR USE OF THE NEAREST EQUIVALENT SIZE OR ALTERNATIVE SPECIES, WITH CORRESPONDING ADJUSTMENT OF CONTRACT PRICE.
4. SUCH PROOF WILL BE SUBSTANTIATED AND SUBMITTED IN WRITING TO THE CONSULTANT AT LEAST 30 DAYS PRIOR TO START OF WORK UNDER THIS SECTION.

INSPECTION
1. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE RESTORATION CONSULTANT FOR CONFORMANCE TO SPECIFICATIONS, EITHER AT TIME OF DELIVERY ON-SITE OR AT THE GROWER'S NURSERY. APPROVAL OF PLANT MATERIALS AT ANY TIME SHALL NOT IMPAIR THE SUBSEQUENT RIGHT OF INSPECTION AND REJECTION DURING PROGRESS OF THE WORK.
2. PLANTS INSPECTED ON SITE AND REJECTED FOR NOT MEETING SPECIFICATIONS MUST BE REMOVED IMMEDIATELY FROM SITE OR RED-TAGGED AND REMOVED AS SOON AS POSSIBLE.
3. THE RESTORATION CONSULTANT MAY ELECT TO INSPECT PLANT MATERIALS AT THE PLACE OF GROWTH. AFTER INSPECTION AND ACCEPTANCE, THE RESTORATION CONSULTANT MAY REQUIRE THE INSPECTED PLANTS BE LABELED AND RESERVED FOR PROJECT. SUBSTITUTION OF THESE PLANTS WITH OTHER INDIVIDUALS, EVEN OF THE SAME SPECIES AND SIZE, IS UNACCEPTABLE.

MEASUREMENT OF PLANTS
1. PLANTS SHALL CONFORM TO SIZES SPECIFIED UNLESS SUBSTITUTIONS ARE MADE AS OUTLINED IN THIS CONTRACT.
2. HEIGHT AND SPREAD DIMENSIONS SPECIFIED REFER TO MAIN BODY OF PLANT AND NOT BRANCH OR ROOT TIP TO TIP. PLANT DIMENSIONS SHALL BE MEASURED WHEN THEIR BRANCHES OR ROOTS ARE IN THEIR NORMAL POSITION.
3. WHERE A RANGE OF SIZE IS GIVEN, NO PLANT SHALL BE LESS THAN THE MINIMUM SIZE AND AT LEAST 50% OF THE PLANTS SHALL BE AS LARGE AS THE MEDIAN OF THE SIZE RANGE. (EXAMPLE: IF THE SIZE RANGE IS 12" TO 18", AT LEAST 50% OF PLANTS MUST BE 15" TALL.).

SUBMITTALS

PROPOSED PLANT SOURCES
1. WITHIN 45 DAYS AFTER AWARD OF THE CONTRACT, SUBMIT A COMPLETE LIST OF PLANT MATERIALS PROPOSED TO BE PROVIDED DEMONSTRATING CONFORMANCE WITH THE REQUIREMENTS SPECIFIED. INCLUDE THE NAMES AND ADDRESSES OF ALL GROWERS AND NURSERIES.

PRODUCT CERTIFICATES
1. PLANT MATERIALS LIST - SUBMIT DOCUMENTATION TO CONSULTANT AT LEAST 30 DAYS PRIOR TO START OF WORK UNDER THIS SECTION THAT PLANT MATERIALS HAVE BEEN ORDERED. ARRANGE PROCEDURE FOR INSPECTION OF PLANT MATERIAL WITH CONSULTANT AT TIME OF SUBMISSION.
2. HAVE COPIES OF VENDOR'S OR GROWERS' INVOICES OR PACKING SLIPS FOR ALL PLANTS ON SITE DURING INSTALLATION. INVOICE OR PACKING SLIP SHOULD LIST SPECIES BY SCIENTIFIC NAME, QUANTITY, AND DATE DELIVERED (AND GENETIC ORIGIN IF THAT INFORMATION WAS PREVIOUSLY REQUESTED).

DELIVERY, HANDLING, & STORAGE

NOTIFICATION
CONTRACTOR MUST NOTIFY CONSULTANT 48 HOURS OR MORE IN ADVANCE OF DELIVERIES SO THAT CONSULTANT MAY ARRANGE FOR INSPECTION.

PLANT MATERIALS
1. TRANSPORTATION - DURING SHIPPING, PLANTS SHALL BE PACKED TO PROVIDE PROTECTION AGAINST CLIMATE EXTREMES, BREAKAGE AND DRYING. PROPER VENTILATION AND PREVENTION OF DAMAGE TO BARK, BRANCHES, AND ROOT SYSTEMS MUST BE ENSURED.
2. SCHEDULING AND STORAGE - PLANTS SHALL BE DELIVERED AS CLOSE TO PLANTING AS POSSIBLE. PLANTS IN STORAGE MUST BE PROTECTED AGAINST ANY CONDITION THAT IS DETRIMENTAL TO THEIR CONTINUED HEALTH AND VIGOR.
3. HANDLING - PLANT MATERIALS SHALL NOT BE HANDLED BY THE TRUNK, LIMBS, OR FOLIAGE BUT ONLY BY THE CONTAINER, BALL, BOX, OR OTHER PROTECTIVE STRUCTURE, EXCEPT BAREROOT PLANTS SHALL BE KEPT IN BUNDLES UNTIL PLANTING AND THEN HANDLED CAREFULLY BY THE TRUNK OR STEM.
4. LABELS - PLANTS SHALL HAVE DURABLE, LEGIBLE LABELS STATING CORRECT SCIENTIFIC NAME AND SIZE. TEN PERCENT OF CONTAINER GROWN PLANTS IN INDIVIDUAL POTS SHALL BE LABELED. PLANTS SUPPLIED IN FLATS, RACKS, BOXES, BAGS, OR BUNDLES SHALL HAVE ONE LABEL PER GROUP.

WARRANTY

PLANT WARRANTY
PLANTS MUST BE GUARANTEED TO BE TRUE TO SCIENTIFIC NAME AND SPECIFIED SIZE, AND TO BE HEALTHY AND CAPABLE OF VIGOROUS GROWTH.

REPLACEMENT
1. PLANTS NOT FOUND MEETING ALL OF THE REQUIRED CONDITIONS AT THE CONSULTANT'S DISCRETION MUST BE REMOVED FROM SITE AND REPLACED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
2. PLANTS NOT SURVIVING AFTER ONE YEAR TO BE REPLACED AT THE CONTRACTOR'S EXPENSE.

PLANT MATERIAL

GENERAL
1. PLANTS SHALL BE NURSERY GROWN IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICES UNDER CLIMATIC CONDITIONS SIMILAR TO OR MORE SEVERE THAN THOSE OF THE PROJECT SITE.
2. PLANTS SHALL BE TRUE TO SPECIES AND VARIETY OR SUBSPECIES. NO CULTIVARS OR NAMED VARIETIES SHALL BE USED UNLESS SPECIFIED AS SUCH.

QUANTITIES
SEE PLANT LIST ON ACCOMPANYING PLANS AND PLANT SCHEDULES.

ROOT TREATMENT
1. CONTAINER GROWN PLANTS (INCLUDES PLUGS): PLANT ROOT BALLS MUST HOLD TOGETHER WHEN THE PLANT IS REMOVED FROM THE POT, EXCEPT THAT A SMALL AMOUNT OF LOOSE SOIL MAY BE ON THE TOP OF THE ROOTBALL.
2. PLANTS MUST NOT BE ROOT-BOUND; THERE MUST BE NO CIRCLING ROOTS PRESENT IN ANY PLANT INSPECTED.
3. ROOTBALLS THAT HAVE CRACKED OR BROKEN WHEN REMOVED FROM THE CONTAINER SHALL BE REJECTED.

MAY CREEK BUFFER MITIGATION NOTES

EXECUTIVE SUMMARY

PSE'S ENERGIZE EASTSIDE PROJECT (THE PROJECT) PROPOSES TO UPGRADE EXISTING TRANSMISSION LINES IN NEWCASTLE IN ORDER TO INCREASE TRANSMISSION SYSTEM CAPACITY TO 230KV POWER. PROJECT ELEMENTS, EXISTING CONDITIONS, MITIGATION SEQUENCING, AND PROJECT IMPACTS TO CRITICAL AREAS ARE DISCUSSED IN THE *CITY OF NEWCASTLE CRITICAL AREAS REPORT* (NEWCASTLE CAR) PREPARED BY THE WATERSHED COMPANY, OCTOBER 2017. THIS BUFFER MITIGATION PLAN IS INTENDED TO REPRESENT THE FINAL MITIGATION PLAN REFERENCED IN THE NEWCASTLE CAR. IT HAS BEEN DESIGNED TO APPROPRIATELY MITIGATE FOR PROJECT IMPACTS OCCURRING IN WETLAND AND STREAM CRITICAL AREA BUFFERS AS DESCRIBED IN THE NEWCASTLE CAR AND REQUIRED BY THE NEWCASTLE MUNICIPAL CODE (NMC).

PROPOSED PROJECT ACTIVITIES IMPACT WETLAND AND STREAM BUFFERS IN ONE OF THREE WAYS: PERMANENT FILL RESULTING FROM TRANSMISSION POLE INSTALLATION/REPLACEMENT (PERMANENT), PERMANENT VEGETATION CONVERSION FROM A FORESTED VEGETATION TYPE DUE TO VEGETATION MANAGEMENT REQUIREMENTS (CONVERSION), AND TEMPORARY IMPACTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES (TEMPORARY). PERMANENT AND CONVERSION BUFFER IMPACTS REQUIRE MITIGATION.

THE PROJECT HAS AVOIDED INCREASING PERMANENT IMPACTS FROM EXISTING CONDITIONS. TWO NEW TRANSMISSION POLES WILL REPLACE FOUR EXISTING POLES IN THE BUFFER OF WETLAND MN01 RESULTING IN AN OVERALL *DECREASE* IN FILL MATERIAL IN THAT BUFFER AREA. THEREFORE, NO MITIGATION FOR PERMANENT IMPACTS IS REQUIRED.

VEGETATION CONVERSION (TREE REMOVAL) IMPACTS OCCUR IN THE BUFFER AREA OF TWO WETLAND AND TWO STREAM FEATURES AND ARE NECESSARY TO ACCOMMODATE THE NEW 230KV TRANSMISSION LINE DESIGN AND MEET FEDERAL SAFETY STANDARDS (SEE TABLE BELOW). THESE IMPACTS TOTAL 2,859 SQUARE FEET (SF). THE MAJORITY (87%) OF VEGETATION CONVERSION IMPACTS OCCUR IN THE BUFFER OF MAY CREEK.

WETLAND OR STREAM BUFFER	AREA OF IMPACT (SF)	DESCRIPTION OF IMPACT
STREAM MB01	101	REMOVAL OF ONE LARGE SHRUB/TREE
WETLAND MN01	79	REMOVAL OF ONE DOMESTIC APPLE TREE
MAY CREEK	2,478	REMOVAL OF 18 NATIVE TREES
WETLAND MN02	201	REMOVAL OF ONE DOMESTIC APPLE TREE

MITIGATION FOR IMPACTS, PRESENTED IN THE TABLE ABOVE, IS PLANNED IN THE MAY CREEK BUFFER. AS DISCUSSED IN THE NEWCASTLE CAR, THIS LOCATION WAS SELECTED FOR MITIGATION ACTIVITIES BASED UPON THE LOCATION OF PROJECT IMPACTS, OPPORTUNITY PRESENT, PROPERTY OWNERSHIP, AND PROXIMITY TO OTHER REGULATED CRITICAL AREAS.

THE MINIMUM MITIGATION AREA REQUIRED, AS PRESENTED IN THE NEWCASTLE CAR IS 1,431 SF. THIS WAS CALCULATED PRIOR TO CONFIRMATION OF THE MITIGATION STRATEGY AND BASED UPON THE ASSUMPTION THAT THIS FINAL MITIGATION PLAN WOULD PROVIDE EQUIVALENT OR GREATER COMPENSATION FOR THE FUNCTIONS LOST BY REMOVING 2,859 SF OF VEGETATION.

THIS FINAL MITIGATION PLAN PROPOSES TO COMPENSATE FOR PROJECT IMPACTS THROUGH BUFFER ENHANCEMENT. AS SUCH, AND IN ORDER TO ENSURE REPLACEMENT OF IMPACTED BUFFER FUNCTIONS, A TOTAL AREA OF 6,418 SF IN THE MAY CREEK BUFFER WILL BE ENHANCED. THE ENHANCEMENT AREA INCLUDES 2,282 SF OF NATIVE SHRUB AND GROUNDCOVER INSTALLATION INTENDED TO COMPENSATE FOR MOST IMPACT AREA FUNCTIONS (2,859 SF OF CANOPY REMOVAL ASSOCIATED WITH YOUNG TREES). ESTABLISHMENT OF 4,136 SF OF POLLINATOR-FRIENDLY HERBACEOUS VEGETATION ENSURES THAT BUFFER FUNCTIONS ARE MAINTAINED OR IMPROVED BY PROVIDING FORAGE FOR POLLINATORS, STABILIZING SOILS, DECREASING SPREAD OF INVASIVE PLANTS, ENHANCING CORRIDOR AESTHETICS, AND IMPROVING OVERALL ECOSYSTEM HEALTH.

OVERVIEW

THE FINAL MITIGATION PLAN CONSISTS OF 6,418 SF OF MAY CREEK BUFFER ENHANCEMENT. THE MITIGATION PLAN INCLUDES A COMPREHENSIVE FIVE-YEAR MAINTENANCE AND MONITORING PLAN, PER NMC 18.24.130. THE PLAN SPECIFIES APPROPRIATE SPECIES FOR PLANTING AND PLANTING TECHNIQUES, DESCRIBES PROPER MAINTENANCE ACTIVITIES, AND SETS FORTH PERFORMANCE STANDARDS TO BE MET YEARLY DURING MONITORING. THESE SPECIFICATIONS AND STANDARDS WILL ENSURE THAT ENHANCEMENT/RESTORATION PLANTINGS WILL BE MAINTAINED, MONITORED, AND SUCCESSFULLY ESTABLISHED WITHIN THE FIRST FIVE YEARS FOLLOWING IMPLEMENTATION.

BUFFER ENHANCEMENT WILL INCLUDE INSTALLATION OF TWO NATIVE PLANTING TYPES: SHRUB MIX (2,282 SF) AND MOWABLE HERBACEOUS POLLINATOR MIX (4,136 SF). THE SHRUB MIX PLANTING AREA INCLUDES VARIOUS TRANSMISSION LINE-FRIENDLY SHRUB SPECIES INTERSPERSED WITH GROUNDCOVERS AND IS LOCATED IN PSE'S TRANSMISSION LINE EASEMENT, EXCLUDING THE CO-LOCATED OLYMPIC PIPELINE COMPANY'S (OPL) EASEMENT. THE MOWABLE HERBACEOUS POLLINATOR MIX IS LOCATED IN THE PSE/OPL CO-LOCATED EASEMENT AND CONSISTS OF MOWABLE POLLINATOR-FRIENDLY HERBACEOUS VEGETATION THAT IS FURTHER DIVIDED INTO TWO PLANTING TYPES (TYPE A AND TYPE B) SUITABLE FOR DIFFERENT GROWING CONDITIONS THAT VARY BASED ON EXISTING ADJACENT VEGETATION, RELATIVE LOCATION ON SLOPE, AND PROXIMITY TO CREEK.

IN ADDITION TO NATIVE PLANTINGS, BUFFER ENHANCEMENT WILL INCLUDE CREATION OF HABITAT SNAGS, HINGE-FELLED TREES, AND PLACEMENT OF DOWNED WOODY DEBRIS IN THE MAY CREEK BUFFER.

THESE MITIGATION ACTIVITIES ARE INTENDED TO INCREASE NATIVE PLANT COVER, DECREASE INVASIVE SPECIES PREVALENCE, IMPROVE NATIVE SPECIES DIVERSITY, AND PROVIDE FOOD AND OTHER HABITAT RESOURCES FOR WILDLIFE.

GOALS

1. ENHANCE MAY CREEK BUFFER.
   a. ESTABLISH DENSE AND DIVERSE TRANSMISSION LINE-FRIENDLY VEGETATION COMMUNITIES THROUGHOUT THE MITIGATION AREA IN TWO MAIN VEGETATION TYPES (SHRUB MIX AND MOWABLE HERBACEOUS POLLINATOR MIX).
   b. INCREASE SPECIAL HABITAT FEATURES IN BUFFER AREA THROUGH CREATION OF HABITAT SNAGS, HINGE-FELLED TREES, AND DOWNED WOODY DEBRIS.

PERFORMANCE STANDARDS

THE STANDARDS LISTED BELOW WILL BE USED TO JUDGE THE SUCCESS OF THE PLAN OVER TIME. IF THE STANDARDS ARE MET AT THE END OF THE FIVE-YEAR MONITORING PERIOD, THE CITY SHALL RELEASE THE PERFORMANCE BOND.

SHRUB MIX AREAS
1. SURVIVAL:
   a. 100% SURVIVAL OF ALL INSTALLED WOODY VEGETATION AND GROUNDCOVERS AT THE END OF YEAR 1, STARTING FROM THE DATE OF SUBSTANTIALLY COMPLETE INSTALLATION. THIS STANDARD MAY BE MET THROUGH ESTABLISHMENT OF INSTALLED PLANTS OR BY REPLANTING AS NECESSARY TO ACHIEVE THE REQUIRED NUMBERS.
   b. 80% SURVIVAL OF ALL INSTALLED WOODY VEGETATION AND GROUNDCOVERS AT THE END OF YEAR 2. THIS STANDARD MAY BE MET THROUGH ESTABLISHMENT OF INSTALLED PLANTS OR BY REPLANTING AS NECESSARY TO ACHIEVE THE REQUIRED NUMBERS.
      i. SURVIVAL BEYOND YEAR 2 IS DIFFICULT TO TRACK. THEREFORE, A DIVERSITY STANDARD IS PROPOSED IN PLACE OF SURVIVAL (SEE #3, BELOW).
2. NATIVE VEGETATION COVER IN PLANTED AREA:
   a. ACHIEVE AT LEAST 60% COVER OF NATIVE SHRUBS BY THE END OF YEAR 3. TRANSMISSION LINE-FRIENDLY NATIVE VOLUNTEER SPECIES MAY COUNT TOWARD THIS STANDARD.
   b. ACHIEVE AT LEAST 80% COVER OF NATIVE SHRUBS BY THE END OF YEAR 5. TRANSMISSION LINE-FRIENDLY NATIVE VOLUNTEER SPECIES MAY COUNT TOWARD THIS STANDARD.
3. SPECIES DIVERSITY IN PLANTED AREAS:
   a. ESTABLISH AT LEAST FOUR NATIVE SHRUB SPECIES, AND TWO NATIVE GROUNDCOVER SPECIES BY YEAR 5. TRANSMISSION LINE-FRIENDLY NATIVE VOLUNTEER SPECIES MAY COUNT TOWARD THIS STANDARD. "ESTABLISHMENT" IS CONSIDERED AT LEAST FIVE HEALTHY, INDIVIDUAL PLANTS OF A GIVEN SPECIES PRESENT WITHIN THE MITIGATION AREAS.
4. INVASIVE SPECIES STANDARD: NO MORE THAN 20% COVER OF INVASIVE SPECIES IN THE PLANTING AREA IN ANY MONITORING YEAR (PER NMC 18.24.132.C.3). INVASIVE SPECIES ARE DEFINED AS ANY CLASS A, B, OR C NOXIOUS WEEDS AS LISTED BY THE KING COUNTY NOXIOUS WEED CONTROL BOARD.

MOWABLE HERBACEOUS POLLINATOR MIX AREAS
1. NATIVE VEGETATION COVER IN PLANTED AREAS:
   a. ACHIEVE AT LEAST 80% COVER OF DESIRABLE SPECIES BY THE END OF YEAR 5.
2. SPECIES DIVERSITY IN PLANTED AREAS:
   a. ESTABLISH AT LEAST 6 DESIRABLE HERBACEOUS SPECIES IN EACH OF THE TWO PLANTING TYPES BY YEAR 5.
3. INVASIVE SPECIES STANDARD: NO MORE THAN 20% COVER OF INVASIVE SPECIES IN THE PLANTING AREA IN ANY MONITORING YEAR (PER NMC 18.24.132.C.3). INVASIVE SPECIES ARE DEFINED AS ANY CLASS A, B, OR C NOXIOUS WEEDS AS LISTED BY THE KING COUNTY NOXIOUS WEED CONTROL BOARD.

PERMIT SET

NOT FOR CONSTRUCTION

MAY CREEK

PLANT INSTALLATION AND BUFFER MITIGATION NOTES

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
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Science & Design

MAY CREEK
BUFFER MITIGATION PLAN
PREPARED FOR: PUGET SOUND ENERGY
ENERGIZE EASTSIDE
PARCELS #: 3345100380
NEWCASTLE, WA

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	10-30-2017	BUFFER MITIGATION PLAN	LM/aj

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: JC
DESIGNED: LM / KC
DRAFTED: LM
CHECKED: JC / KC
JOB NUMBER:
111103.11
SHEET NUMBER:
W3 OF 4

FILENAME
PRINTED BY
DATE

MAY CREEK BUFFER MITIGATION NOTES

HABITAT FEATURES

1. MAINTAIN/RETAIN CREATED SNAGS, HINGE-FELLED TREES, AND DOWNED WOODY DEBRIS IN MITIGATION AREAS AS SPECIFIED IN THE PLANS FOR THE DURATION OF THE MAINTENANCE AND MONITORING PERIOD, AND THEREAFTER.

MONITORING METHODS

THIS MONITORING PROGRAM IS DESIGNED TO TRACK THE SUCCESS OF THE MITIGATION SITE OVER TIME BY MEASURING THE DEGREE TO WHICH THE PERFORMANCE STANDARDS LISTED ABOVE ARE BEING MET. METHODS ARE CONSISTENT WITH THOSE OUTLINED IN NMC 18.24.132.

MONITORING OF THE MITIGATION SITE AND ASSOCIATED MONITORING REPORTS WILL BE CONDUCTED/PREPARED BY A RESTORATION SPECIALIST AND SUBMITTED TO THE CITY FOR REVIEW ON THE FOLLOWING SCHEDULE (IN ACCORDANCE WITH NMC 18.24.132.C.4):

1. AN AS-BUILT PLAN AND REPORT WILL BE PREPARED WITHIN 30 DAYS OF SUBSTANTIALLY COMPLETE INSTALLATION OF THE MITIGATION AREA. THE AS-BUILT PLAN WILL DOCUMENT CONFORMANCE WITH THESE PLANS AND WILL DISCLOSE ANY SUBSTITUTIONS OR OTHER NON-CRITICAL DEPARTURES. THE AS-BUILT PLAN WILL ESTABLISH BASELINE PLANT INSTALLATION QUANTITIES, PHOTO POINTS, MONITORING TRANSECTS, AND SURVEY PLOTS THAT WILL BE USED THROUGHOUT THE MONITORING PERIOD TO MEASURE THE PERFORMANCE STANDARDS.
2. THE FIRST ANNUAL MONITORING REPORT WILL BE PREPARED AT THE END OF THE GROWING SEASON, AFTER INSTALLED PLANTS HAVE EXPERIENCED ONE FULL GROWING SEASON, AND ANNUALLY THEREAFTER. ANNUAL MONITORING REPORTS WILL INCLUDE THE FOLLOWING INFORMATION:
   a. SUMMARY OF PREVIOUS/SPRING VISITS.
   b. PLANT SURVIVAL AND/OR MORTALITY IN MITIGATION AREAS.
   c. CALCULATION OF NATIVE SPECIES COVER IN SURVEY PLOTS USING THE POINT-FRAME METHOD AND ALONG TRANSECTS USING THE LINE-INTERCEPT METHOD.
   d. ESTIMATES OF NATIVE SPECIES COVER SITE WIDE.
   e. INVASIVE SPECIES COVER AT SURVEY PLOTS AND ALONG TRANSECTS AND ESTIMATED SITE WIDE.
   f. COUNTS OF ESTABLISHED NATIVE SPECIES TO DETERMINE SPECIES RICHNESS.
   g. PHOTOGRAPHIC DOCUMENTATION AT PERMANENT PHOTO POINTS.
   h. INTRUSIONS INTO THE PLANTING AREAS, EROSION, VANDALISM, TRASH, AND OTHER ACTIONS DETRIMENTAL TO THE OVERALL HEALTH OF THE MITIGATION AREAS.
   i. RECOMMENDATIONS FOR MAINTENANCE IN THE MITIGATION AREAS.
   j. RECOMMENDATIONS FOR REPLACEMENT OF ALL DEAD OR DYING PLANT MATERIAL WITH SAME OR LIKE SPECIES AND NUMBER AS ON THE APPROVED PLAN.
3. SPRING MONITORING IS RECOMMENDED EARLY IN EACH GROWING SEASON IN YEARS 2 THROUGH 5 TO NOTIFY THE OWNER AND/OR MAINTENANCE CREWS OF NECESSARY EARLY SEASON MAINTENANCE. RECOMMENDATIONS WILL BE ISSUED IN A SPRING MEMO AND WILL NOT BE SUBMITTED TO THE CITY.

CONSTRUCTION NOTES AND SPECIFICATIONS

GENERAL NOTES

THE RESTORATION SPECIALIST WILL OVERSEE THE FOLLOWING:

1. TREE REMOVAL, SNAGGING, HINGE-FELLING, AND PLACEMENT OF DOWNED WOODY DEBRIS;
2. INVASIVE WEED CLEARING AND SITE PREPARATION FOR SEEDING; AND
3. PLANT MATERIAL INSPECTION.
   a. PLANT DELIVERY INSPECTION.
   b. 50% PLANT INSTALLATION/LAYOUT INSPECTION.
   c. 100% PLANT INSTALLATION INSPECTION.

WORK SEQUENCE

1. TREE REMOVAL AND HABITAT FEATURE CREATION:
   a. REMOVE TREES THAT ARE NOT FEASIBLE TO RETAIN WITH IMPLEMENTATION OF THE FOLLOWING RECOMMENDATIONS PROVIDED IN THE PROJECT GEOTECHNICAL REPORT AS DETAILED BELOW.
      i. TREES SHOULD BE ACCESSED BY FOOT.
      ii. STUMPS SHOULD REMAIN IN PLACE, BUT MAY BE CUT TO GROUND LEVEL.
      iii. TREE DEBRIS SHOULD BE SCATTERED UP-SLOPE OF THE BUFFER AREA NEAR THE REMOVAL SITE.
   b. SNAG DESIGNATED TREES ACCORDING TO PLAN DETAIL, AND CONSISTENT WITH RECOMMENDATIONS IN THE ASSOCIATED GEOTECHNICAL REPORT.
      i. SALVAGE TOPS OF TREE #1164 AND #1169 FOR INSTALLATION AS DOWNED WOODY DEBRIS AS INDICATED IN THE DETAIL (SHEET W2) AND PLANS.
      ii. LARGE DOWNED WOODY DEBRIS SHOULD BE PLACED PERPENDICULAR TO THE SLOPE, OR ROUGHLY PARALLEL TO THE SLOPE CONTOUR, IN A STABLE POSITION.
      iii. REMAINING TREE DEBRIS SHOULD BE SCATTERED UP-SLOPE OF THE BUFFER AREA NEARBY.
   c. HINGE-CUT DESIGNATED TREES ACCORDING TO PLAN DETAIL (SHEET W2).
2. CLEAR THE PLANTING AREA OF ALL INVASIVE WOODY VEGETATION INCLUDING BUT NOT LIMITED TO HIMALAYAN BLACKBERRY. PULL OTHER HERBACEOUS INVASIVE VEGETATION AS ENCOUNTERED (E.G., REED CANARY GRASS, HERB ROBERT).
3. INSTALL EROSION CONTROLS SUCH AS WATTLES OR JUTE MAT AS DETERMINED NECESSARY IN COORDINATION WITH GEOTECHNICAL CONSULTANT.
4. INSTALL SHRUB MIX AREAS:
   a. LAYOUT VEGETATION TO BE INSTALLED PER THE PLANTING PLAN AND PLANT SCHEDULE WITH CONSIDERATION OF PLANT SPECIES GROWING CONDITIONS.
   b. PREPARE A PLANTING PIT FOR EACH PLANT AND INSTALL PER THE PLANTING DETAILS. INSTALL PLANTS DURING DORMANT SEASON (OCTOBER 15TH TO MARCH 1ST).
   c. MULCH EACH PLANT WITH A CIRCULAR WOOD CHIP MULCH RING, 4 INCHES THICK AND EXTENDING 9 INCHES FROM THE BASE OF THE PLANT (18-INCH DIAMETER). MAINTAIN THREE INCH GAP BETWEEN MULCH AND PLANT STEM.
   d. SCHEDULE WATERING TRUCK TO PROVIDE AT LEAST ONE INCH OF WATER PER WEEK, AS NECESSARY, FROM JUNE 1ST TO SEPTEMBER 30TH FOR AT LEAST TWO SUMMERS AFTER INITIAL PLANT INSTALLATION. ALTERNATIVE WATERING METHODS (E.G., GATOR BAGS) MAY UTILIZED WITH APPROVAL FROM THE RESTORATION SPECIALIST.
5. INSTALL MOWABLE HERBACEOUS POLLINATOR MIX AREAS[1]:
   a. PREPARE AREA TO BE SEEDED IN THE EARLY FALL (AUG-SEPT) BY MOWING EXISTING, WEEDY VEGETATION TO GROUND LEVEL.
   b. ONCE VEGETATION HAS BEGUN TO REGROW (APPROXIMATELY 4 TO 6 INCHES TALL) APPLY NON-SELECTIVE, NON-PERSISTENT HERBICIDE. HERBICIDE SHOULD BE APPROPRIATE FOR USE NEAR AQUATIC AREAS AND APPLIED BY A STATE LICENSED APPLICATOR WITH AN AQUATIC ENDORSEMENT. HERBICIDE APPLICATION SHOULD BE CONSISTENT WITH THE INSTRUCTIONS ON THE HERBICIDE LABEL.
   c. AT LEAST 72 HOURS AFTER HERBICIDE APPLICATION, INSTALL BIODEGRADABLE WEED FABRIC TO COVER MOWED AND TREATED AREAS TO BE SEEDED, BIODEGRADABLE WEED FABRIC SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS.
   d. APPLY THREE INCHES OF TOPSOIL OVER WEED FABRIC WITH APPROVAL FROM GEOTECHNICAL CONSULTANT, AND RAKE SMOOTH.
   e. IMMEDIATELY FOLLOWING APPLICATION OF TOPSOIL, SPREAD SEED MIXES IN AREAS DEPICTED ON PLANS AT APPROPRIATE RATES. SEEDING SHOULD TAKE PLACE IN THE FALL FROM SEPTEMBER TO MID OCTOBER. APPLY SEED EVENLY BY BROADCAST SEEDING. SEEDS SHOULD BE MIXED WITH SLIGHTLY DAMP INERT MATERIALS SUCH AS COARSE-TEXTURED SAND, VERMICULITE, RICE HULLS, OR SAWDUST.
   f. ROLL SEEDED AREA TO ENSURE GOOD SEED CONTACT WITH SOIL USING STANDARD LAWN ROLLER.
   g. IF DETERMINED NECESSARY BY GEOTECHNICAL CONSULTANT, PROTECT PLANTING SITE FROM EROSION USING WEED-FREE STRAW.

MAINTENANCE

THIS SITE WILL BE MAINTAINED FOR FIVE YEARS FOLLOWING COMPLETION OF THE INITIAL PLANT AND SEED INSTALLATION.

1. ROUTINE MAINTENANCE OF SHRUB MIX AREAS:
   a. AT LEAST TWICE YEARLY, REMOVE BY HAND ALL COMPETING WEEDS AND WEED ROOTS FROM BENEATH EACH INSTALLED PLANT AND ANY DESIRABLE VOLUNTEER VEGETATION TO A DISTANCE OF 12 INCHES FROM THE MAIN PLANT STEM. WEEDING SHOULD OCCUR AS NEEDED DURING THE SPRING AND SUMMER. FREQUENT WEEDING WILL RESULT IN LOWER MORTALITY AND LOWER PLANT REPLACEMENT COSTS.
   b. DO NOT WEED THE AREA NEAR THE PLANT BASES WITH STRING TRIMMER (WEED WHACKER). NATIVE WOODY PLANTS ARE EASILY DAMAGED OR KILLED, AND WEEDS EASILY RECOVER AFTER TRIMMING.
   c. DURING REGULAR WEED MAINTENANCE EFFORTS (FOCUSED AROUND INSTALLED VEGETATION), ALSO GRUB OUT ANY INVASIVE SPECIES PRESENT IN DESIGNATED MITIGATION AREAS AND REMOVE FROM THE SITE.
   d. APPLY SLOW RELEASE, PHOSPHOROUS-FREE, GRANULAR FERTILIZER TO EACH INSTALLED PLANT ANNUALLY IN THE SPRING (BY JUNE 1) OF YEARS 2 THROUGH 5.
   e. MULCH THE WEEDED AREAS BENEATH EACH PLANT WITH WOOD CHIP MULCH AS NECESSARY TO MAINTAIN A MINIMUM 4-INCH-THICK, 18-INCH-DIAMETER MULCH RING.
   f. ENSURE PLANTS RECEIVE A MINIMUM OF ONE INCH OF WATER PER WEEK, AS NEEDED, FROM JUNE 1ST THROUGH SEPTEMBER 30TH FOR THE FIRST TWO YEARS FOLLOWING INSTALLATION. THE MOST FEASIBLE IRRIGATION OPTION FOR THE SITE IS EXPECTED TO BE USE OF A WATERING TRUCK. IRRIGATION BEYOND THE SECOND YEAR MAY BE NEEDED BASED ON SITE PERFORMANCE OR SIGNIFICANT REPLANTING.
   g. FOLLOW ADDITIONAL RECOMMENDATIONS NOTED IN THE SPRING OR ANNUAL MONITORING SITE VISIT.
   h. AS DIRECTED, INSTALL REPLACEMENT PLANTS DURING THE UPCOMING FALL DORMANT SEASON (OCTOBER 15TH TO MARCH 1ST).
2. ROUTINE MAINTENANCE OF MOWABLE HERBACEOUS POLLINATOR MIX AREAS[1]:
   a. IN THE FIRST GROWING SEASON, REGULARLY MOW SEEDED AREA TO CONTROL ANNUAL WEEDS. MOWING SHOULD OCCUR WHEN VEGETATION REACHES A HEIGHT OF 8 TO 12 INCHES OR WHEN WEEDS BEGIN TO FLOWER.
   b. AVOID PULLING WEEDS IN THE FIRST YEAR TO LIMIT DISTURBANCE TO SURROUNDING DESIRABLE SEEDLINGS. WEEDS MAY BE SPOT SPRAYED WITH HERBICIDE AS NECESSARY WITH APPROVAL FROM THE RESTORATION SPECIALIST.
   c. IN EARLY SPRING OF YEAR 2, MOW PREVIOUS SEASON'S DEBRIS AND REMOVE FROM SITE.
   d. LIMIT MOWING DURING YEAR 2 TO TARGET FLOWERING BIENNIAL WEEDS; PREVENT WEED SEED DEVELOPMENT AND DISPERSAL.
   e. IN YEARS 3-5, MOW IN EARLY SPRING TO PREVENT WOODY SPECIES ESTABLISHMENT AND COOL SEASON WEEDY GRASSES.
   f. REGULAR WATERING IS NOT NECESSARY FOR SEEDED AREAS UNLESS THERE IS INADEQUATE RAINFALL AFTER SEED GERMINATION OR DROUGHT CONDITIONS ARE PRESENT. CONSULT THE RESTORATION SPECIALIST IF UNCERTAIN ABOUT WATERING NEEDS.

CONTINGENCY PLAN

PER NMC 18.24.132.B, A CONTINGENCY PLAN SHALL BE ESTABLISHED FOR CORRECTION IN THE EVENT THAT THE MITIGATION PROJECT IS INADEQUATE OR FAILS. A PERFORMANCE AND MAINTENANCE BOND OR OTHER ACCEPTABLE SECURITY DEVICE IS REQUIRED TO ENSURE THE APPLICANT'S COMPLIANCE WITH THE TERMS OF THE MITIGATION AGREEMENT. THE BOND OR OTHER SECURITY SHALL MEET THE REQUIREMENTS SET FORTH IN NMC 18.24.140 (FINANCIAL GUARANTEE TO ENSURE MITIGATION, MAINTENANCE AND MONITORING).

MATERIAL SPECIFICATIONS AND DEFINITIONS

1. BIODEGRADABLE WEED FABRIC: PRODUCT SHALL BE COMPOSED OF 100% BIODEGRADABLE MATERIAL, SHALL BE INTENDED TO SUPPRESS WEED GROWTH, AND SHALL FULLY DECOMPOSE IN 1-5 YEARS AFTER INSTALLATION. CONTRACTOR SHALL SUBMIT PRODUCT SPECIFICATION TO THE RESTORATION SPECIALIST FOR APPROVAL PRIOR TO PURCHASE.
2. FERTILIZER: SLOW RELEASE, GRANULAR PHOSPHOROUS-FREE FERTILIZER. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR APPLICATION. KEEP FERTILIZER IN A WEATHER-TIGHT CONTAINER WHILE ON SITE. NOTE THAT FERTILIZER IS TO BE APPLIED ONLY IN YEARS 2 THROUGH 5 AND NOT IN THE FIRST YEAR.
3. TOPSOIL: COMMERCIALLY PRODUCED SOIL MIX CONTAINING EQUAL PARTS OF SAND, COMPOST, AND LOAM SOIL. MIX AND QUANTITY TO BE APPROVED BY THE RESTORATION SPECIALIST.
4. RESTORATION SPECIALIST: THE WATERSHED COMPANY [(425) 822-5242] PERSONNEL OR OTHER PERSON QUALIFIED TO EVALUATE ENVIRONMENTAL RESTORATION PROJECTS.
5. WOOD CHIP MULCH: CHIPPED WOODY MATERIAL APPROXIMATELY 1 INCH MINIMUM TO 3 INCHES IN MAXIMUM DIMENSION (NOT SAWDUST OR COARSE HOG FUEL). MULCH SHALL NOT CONTAIN APPRECIABLE QUANTITIES OF GARBAGE, PLASTIC, METAL, SOIL, AND DIMENSIONAL LUMBER OR CONSTRUCTION/ DEMOLITION DEBRIS. PACIFIC TOPSOIL [(800) 844-7645] SELLS SUITABLE WOODCHIP MULCH CALLED “WOOD CHIP MULCH” AT MANY OF THEIR LOCATIONS. NOTE: ARBORIST WOODCHIPS GENERALLY CONTAIN WEED SEEDS AND ARE NOT A RELIABLE ALTERNATIVE.

ONLINE REFERENCES/RESOURCES

ESTABLISHING POLLINATOR MEADOWS FROM SEED BY THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION:

HTTP://WWW.XERCES.ORG/WP-CONTENT/UPLOADS/2013/12/ESTABLISHINGPOLLINATORMEADOWS.PDF

CONSERVATION COVER FOR POLLINATORS: WESTERN OREGON & WASHINGTON SPECIFICATIONS BY THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION:

HTTP://WWW.XERCES.ORG/WPCONTENT/UPLOADS/2013/01/INSTALLGUIDEJOBSHEET
_WORANDWA_CNSRVCVR.PDF

FOOTNOTES:
1. POLLINATOR MIX PLANTING AREA NOTES AND SPECIFICATIONS HAVE BEEN DEVELOPED USING VARIOUS SOURCES AND BEST PROFESSIONAL JUDGEMENT. REFERENCES ARE PROVIDED IN THESE PLANS FOR USE/REVIEW BY INTERESTED PARTIES AND CONTRACTORS. SPECIFIED POLLINATOR SEED MIXES MAY BE SUBSTITUTED BY AN ALTERNATE NATIVE POLLINATOR SEED MIX, AS APPROVED BY THE RESTORATION SPECIALIST.

PERMIT SET

NOT FOR CONSTRUCTION

MAY CREEK

BUFFER MITIGATION NOTES (CONTINUED)

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
www.watershedco.com
Science & Design

MAY CREEK
BUFFER MITIGATION PLAN
PREPARED FOR: PUGET SOUND ENERGY
ENERGIZE EASTSIDE
PARCELS #: 3345100380
NEWCASTLE, WA

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	10-30-2017	BUFFER MITIGATION PLAN	LM/aj

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: JC
DESIGNED: LM / KC
DRAFTED: LM
CHECKED: JC / KC
JOB NUMBER: 111103.11
SHEET NUMBER: W4 OF 4

FILENAME
PRINTED BY
DATE