CRITICAL AREAS REPORT
WETLAND AND FISH AND WILDLIFE HABITAT
VOIGHTS CREEK FISH HATCHERY
ORTING, WASHINGTON

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FOR
MWH AMERICAS, INC.

GEOENGINEERS

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Critical Areas Report
Wetland and Fish and Wildlife Habitat
Voights Creek Fish Hatchery
Orting, Washington
File No. 3730-099-02

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INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) was contracted by MWH Americas, Inc. (MWH) to assess wetland and fish and wildlife habitat associated with property owned by the Washington Department of Fish and Wildlife (WDFW) at the Voights Creek Fish Hatchery. WDFW plans to make hatchery improvements that will include new construction and re-construction of specific site features within property that is currently owned and operated for the purpose of fish production. The purpose of the project is to improve the existing infrastructure at the hatchery to promote continued operation of the facility in a cost-effective manner with minimal environmental impacts. This report addresses wetlands and fish and wildlife habitat associated with proposed hatchery improvements in accordance with Pierce County Code (PCC) Review Procedures for Wetlands and Fish and Wildlife Habitat Conservation Areas (PCC 18E.30 and 18E.40, respectively) and the provision for a combined habitat assessment and wetland review process indicated in PCC 18E.40.030 § C. This report also includes discussion of a conceptual buffer enhancement plan as mitigation for impacts to regulated buffers in accordance with PCC 18E.40.050.

SITE LOCATION AND DESCRIPTION

The Voights Creek Fish Hatchery is located in southern Pierce County along State Route (SR) 162 near the town of Orting, Washington (Figure 1). The hatchery is located on property identified by the Pierce County Assessor as Parcel 0519333006, hereafter referred to as the "site." The site is accessed via Voights Creek Hatchery Road, which terminates as a dead-end near the hatchery. The site is located to the north of SR-162 in the SE ¼ of the SW ¼ of Section 33, Township 19N, Range 05E and the SW ¼ of the SE ¼ of Section 33, Township 19N, Range 05E of the Willamette Meridian. Voights Creek flows adjacent to the site and bisects Parcel 0519333006, which is approximately 6.2 acres in size. Drawings of the baseline conditions at the site are provided in Appendices A and B.

Aerial photographs and field observations reveal that the site is currently developed with numerous buildings and structures including two residences, a hatchery building, several outbuildings, and both paved and earthen ponds used for pollution abatement and fish production. Much of the landscape within the site that is not occupied by a specific structure is currently paved; there is also some lawn and residential landscaping, as well as a forested area in the western-most corner and some shrub-dominated riparian habitat along Voights Creek.

The site occupies part of the broad floodplain of Voights Creek and its topography is generally flat. Prior bank stabilization and armoring has occurred along most of Voights Creek through, and adjacent to, the site. Excavations have occurred historically at the site where the pollution abatement and adult holding ponds are located. A fish weir and fish ladder were constructed in and adjacent to Voights Creek in the 1970s. The site has been maintained and/or improved for hatchery operation over the past 90+ years. Vegetation within the site has been altered significantly, with the exception of a few pockets of native trees and shrubs.

PROJECT PURPOSE

The Voights Creek Fish Hatchery facility was initially designed and built in 1917 and significantly expanded in the 1960s and 1970s. Some of the features that exist today are original. These site features are obsolete by today's standards for hatchery design. Improvements are planned for the site in two phases to be constructed between 2009 to 2011 (Phase 1) and 2011 to 2013 (Phase 2). Improvements that are proposed as part of this project are shown in Appendices A and B.

Phase 1 will include the following elements:

- Replacing the existing earthen adult holding pond with three new parallel concrete ponds;
- Constructing a new fish ladder connecting Voights Creek to the new adult holding ponds;
- Stream bank restoration adjacent to the fish ladder to improve aesthetic and habitat values and mitigate for project impacts;
- Constructing a dedicated spawning shed adjacent to the new adult holding ponds;
- Constructing a new pump station to serve the new adult holding ponds;
- Constructing a new pollution abatement pond;
- Removing the existing 1917 residence;
- Creating two new stormwater bio-infiltration cells at the site of the existing pollution abatement pond and within the footprint of the existing adult holding pond to protect water quality;
- Relocating the main electrical service to the feed storage building; and
- Installing new asphalt paving.

Phase 2 will include the following elements:

- Replacing the two rearing ponds with two new 42-ft by 140-ft rearing ponds in approximately the same location;
- Establishing a pre-settling pond in an existing raceway; and
- Installing additional new asphalt paving; and
- Comprehensive landscaping throughout the site using native species.

Improvements planned for these features will increase the efficiency of fish production at the hatchery and help the facility meet conservation goals for threatened and endangered salmonids.

METHODS

Methods used to determine baseline wetland and fish and wildlife habitat conditions at the site included a paper inventory in which we reviewed relevant data sources and a field effort to document current site conditions and identify and delineate on-site wetland and fish and wildlife habitat features. These features were mapped using a handheld survey grade Trimble GeoXH geographic positioning system (GPS) unit and post-processed according to accepted methods for differential correction to improve data accuracy. The methods we employed generally followed guidance given in PCC 18E.30 "Wetlands" and PCC 18E.40 "Regulated Fish and Wildlife Species and Habitat Conservation Areas."

PAPER INVENTORY

We conducted a review of existing information, including pertinent and applicable data and maps, prior to conducting field work. To gain an understanding of the possible presence of wetlands on the site, we reviewed the United States Geological Survey (USGS) 7.5' topographic map series, the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (USFWS 2008), the Web Soil Survey and National Hydric Soils List from the National Resources Conservation Service (NRCS) (USDA 2008a,b) and the Pierce County Wetland Maps (Pierce County 2003).

We also consulted available sources of literature regarding possible presence of endangered, threatened, or sensitive species listed by federal or state governments, as well as other regulated fish and wildlife habitats. These data sources included the USFWS endangered and threatened species lists for Pierce County, Washington (USFWS 2007); the Washington Department of Natural Resources (WDNR) Washington Natural Heritage Program (WNHP) database (WDNR 2008a); the WDFW Priority Habitats and Species (PHS) mapping data (WDFW 2008a); the SalmonScape interactive database (WDFW 2008b); and the WDNR Forest Practices Application Review System (FPARS) map database (WDNR 2008b). We focused primarily on the PHS and WNHP data to make a determination of whether regulated species occur on site.

FIELD INVESTIGATION

GeoEngineers biologists visited the site and conducted a thorough reconnaissance on September 10 and 11, 2008. We traversed the site on foot and documented the presence of wetland and fish and wildlife habitat features. We also looked for and noted any wildlife present in the vicinity. Photographs taken during this visit are included in Appendix C.

Wetland Delineation

We conducted a formal wetland delineation of each wetland feature found on the site during our reconnaissance. Wetland delineations were conducted according to current accepted methods (Environmental Laboratory 1987, Washington State Department of Ecology [Ecology] 1997, US Army Corps of Engineers [USACE] 2008). Wetland determinations were made upon positive confirmation of three wetland parameters: vegetation, soils and hydrology. We traversed the entire undeveloped portion of the property searching for confirmation of the three parameters. Once potentially wet areas were defined we established five sample plots throughout the site and flagged and numbered each; these sample plots were located in potential wetland areas identified within the site. At each sample plot, we recorded data on vegetation, soil and hydrology to determine the presence or absence of the three wetland indicators. If indicators of all three wetland parameters were present, the sample plot was determined to be located within the wetland. If indicators for any of the three wetland parameters were not found, the sample plot was determined to be outside of the wetland. We then conducted repeated sampling throughout the wetland and adjacent areas to observe potential variation in the three wetland parameters. We based our final determination of wetland boundaries on vegetation shifts, changes in soil characteristics, indicators of hydrology and prominent topographical breaks. Sequentially numbered flags were placed along the wetland boundary to indicate delineation between wetland and upland habitats.

Hydrophytic Vegetation

Hydrophytic plants are species that are specifically adapted to survive in areas where the frequency and duration of inundation or soil saturation during the growing season is sufficient to exert a controlling influence on the plant species present (Ecology 1997). Oxygen available to plant roots and soil microbes is depleted rapidly when soils become saturated. This condition becomes a selective factor as to which

plant species are able to survive and/or out-compete other species at a site if the frequency and duration of saturation are sufficient (Environmental Laboratory 1987). Identifying the plant species present at a site gives us insight as to this condition and is the basis for the hydrophytic vegetation parameter of wetland delineation.

Plant species were identified and percent cover of each species was estimated for each vegetative stratum (tree, shrub or herbaceous layer) at every sample plot. Plant nomenclature follows the NRCS PLANTS database (USDA 2008c). We classified each plant species as OBL, FACW, FAC, FACU or UPL according to the *National List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (Reed 1988) and *Supplement to the National List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (Reed *et al.* 1993). These categories are described in Table 1. Dominance of each species was calculated according to the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). Prevalence of dominant hydrophytic vegetation was determined by calculating the proportion of dominant plant species within a sample plot that were OBL, FACW or FAC. Hydrophytic vegetation must exceed 50 percent of the dominant species for each vegetative stratum to meet the wetland criteria for vegetation.

Table 1. USFWS Plant Indicator Status

Indicator Status	Definition
OBL	Obligate Wetland: occur almost always (estimated probability >99%) under natural conditions in wetlands.
FACW	Facultative Wetland: usually occur in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
FAC	Facultative: equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
FACU	Facultative Upland: usually occur in non-wetlands, but occasionally found in wetlands (1%-33%).
UPL	Obligate Upland: plants that rarely occur (estimated probability <1%) in wetlands, but occur almost always in non-wetlands under natural conditions.
NI	No Indicator Status: insufficient information exists to assign an indicator status.

Hydric Soils

Hydric soils are those that are saturated or ponded long enough during the growing season to develop anaerobic conditions in the upper layer (Environmental Laboratory 1987). Prolonged anaerobic soil conditions lead to a chemically reducing environment. The chemical reduction of some soil components (e.g., iron and manganese oxides) leads to the development of soil colors, stratification and other physical characteristics that can be indicative of hydric soils (Ecology 1997). Soil color can be identified by the use of a soil color chart, such as the one commercially produced by Kollmorgen (1988), which is commonly used by wetland scientists. Soil color is identified by hue, chroma and value. Hue describes the soil based on its relation to the spectral colors (red, yellow, green, blue, purple or a mixture of these colors); chroma indicates the strength or purity of the color and value describes the degree of lightness. Soil color, texture, organic content and stratification within the soil profile can be compared against common indicators of hydric soils for the purpose of making wetland determinations.

Hydrology

Hydrology is defined as the presence, distribution and movement of water. The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Numerous factors (e.g., precipitation, topography, soil permeability, plant cover and human disturbance) influence the hydrology of an area (Ecology 1997). Hydrology is often the least exact of the parameters, and indicators of wetland

hydrology are sometimes difficult to find in the field. This is especially prevalent when wetlands are delineated in the summer months when springs or seeps may not be apparent. Under these conditions, indicators of hydrology are used as positive identification. Presence of water at the surface, soil saturation, sediment deposits, algal crusts, water-stained leaves, and/or geomorphic position are some examples of common indicators used to confirm wetland hydrology.

Fish and Wildlife Habitat

We also documented the presence of observed streams on the site during our reconnaissance. We identified stream features which were characterized by distinct channels and thus presented an ordinary high water mark (OHWM), following methods suggested by Ecology (2007). We flagged the OHWM of each stream channel within the site. We also continued flagging the OHWM of Voights Creek outside of the site boundary to ensure that its buffer was accurately accounted for where it extends onto the site. In addition to identifying streams, we documented observed species utilization, potential wildlife habitat and physical habitat features (snags, nests, burrows, trails, dens, etc.) present at the site during this visit.

WETLAND EVALUATION, STREAM TYPING AND BUFFERS

We used two methods to evaluate on-site wetlands. We assessed the wetland classification as defined by the Cowardin system (Cowardin *et al.* 1979) and we used the wetland classification and buffer regulations according to Pierce County, which is consistent with the Ecology classification and ranking system. The Cowardin system describes wetlands by the plant communities, soils and hydrologic regimes present. The hierarchical order identifies five major types of wetland systems: Marine, Estuarine, Riverine, Lacustrine and Palustrine. These systems are further stratified into classes and subclasses based on substrate materials, flooding regime and vegetation life form. Each class and subclass is then annotated with specific modifiers for water regimes, water chemistry, soil and other special conditions. The naming convention has been adopted by the USFWS for their NWI maps.

We used the Washington State Wetland Rating System for Western Washington (Hruby 2004), as specified in PCC 18E.30.030 § D, to classify wetlands on the site into one of four hierarchical categories: I, II, III or IV. Wetlands are categorized based on three wetland functions: water quality, hydrologic and habitat. A wetland is rated based on its *potential* and *opportunity* to perform each function. In this rating system, the term *potential* is used to describe "the structural characteristics in a wetland as indicators of the capability of performing a function." In other words, "Does the wetland have the necessary structures and conditions present within its boundaries to provide the function?" The second term, *opportunity*, is used to assess "to what degree the wetland's position in the landscape will allow it to perform a specific function."

We also applied the appropriate stream type to on-site stream segments and assigned the corresponding buffer, according to PCC 18E.40. For purpose of stream typing, streams are designated as Types S1, F1, F2, N1, N2 or N3.

RESULTS

PAPER INVENTORY

Wetlands

USGS topographic maps do not show any wetlands on the site. Data available from the NWI and Pierce County wetland databases (USFWS 2008, Pierce County 2008a) show a single wetland feature on the site, which appears to correspond with the location of the existing asphalt-lined rearing ponds at the

facility. Other mapped wetland features are shown off site to the south and east, more than 300 feet away from the site and across SR 162. These features are shown on Figure 2. Soil types mapped on the site (USDA, 2008a) include Puyallup fine sandy loam and unidentified aquic xerofluvents (recently deposited material in the floodplain); these soils are not listed as hydric by the USDA (2008b), although based on the soil taxonomy, unidentified aquic xerofluvents are assumed to be hydric. A soil survey map is provided as Figure 3.

Fish and Wildlife Species and Habitat

We reviewed species information based on the WDFW PHS mapping database (WDFW 2008a) and SalmonScape interactive mapper (WDFW 2008b). These sources do not indicate any terrestrial priority habitats or species located on the site. The WDNR-WNHP database (WDNR 2008a) did not include the site on its list of localities which contain rare plant species. However, Voights Creek flows adjacent to the southern edge of the site. Both PHS data and the SalmonScape web site indicate the presence of Chinook, coho, chum and pink salmon as well as steelhead trout in Voights Creek. The listing status of these fish according to federal, state and county sources is provided in Table 2, below. In addition to these listed species, Voights Creek likely supports populations of other fish species, including but not limited to resident rainbow trout, sculpins and lamprey.

Table 2. Federal-, State-, and County-Listed Species

Common Name	Latin Name	Federal Status[1]	State Status[2]	County Status[3]
Chinook salmon	*Oncorhynchus tshawytscha*	Threatened	Candidate	Locally Important
Chum salmon	*Oncorhynchus keta*	--	--	Locally Important
Coho salmon	*Oncorhynchus kisutch*	Species of Concern	--	Locally Important
Pink salmon	*Oncorhynchus gorbuscha*	--	--	Locally Important
Steelhead trout	*Oncorhynchus mykiss*	Threatened	--	Locally Important
Cutthroat trout	*Oncorhynchus clarki clarki*	--	--	Locally Important

Notes:
[1] NOAA (2008) and USFWS (2007).
[2] WDFW (2008c).
[3] PCC 18E.40.020 § C.

Additional information on species listed under ESA was obtained from the USFWS (2007) and NOAA Fisheries (2008). The USFWS indicates a number of listed threatened and endangered species that may occur in Pierce County, including: bull trout (*Salvelinus confluentus*), Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), grizzly bear (*Ursus arctos horribilis*), marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), marsh sandwort (*Arenaria paludicola*), golden paintbrush (*Castilleja levisecta*), and water howellia (*Howellia aquatilis*). These species are not expected to occur on the site. NOAA Fisheries does not produce separate species lists by county; NOAA-listed salmon and steelhead trout are included in Table 2, above, whereas marine species are not expected to occur on the site.

WETLAND DELINEATION

We established five sample plots non-randomly across the site in potential wetland areas. These sample plots are shown on Figure 4. At each sample plot, we collected data regarding each of the three wetland parameters, as described in "Methods." Data sheets associated with each plot are presented in Appendix

D. Where data collected at a sample plot resulted in a positive wetland determination, we completed a formal delineation of the entire wetland.

We delineated a single wetland feature during our site reconnaissance, labeled Wetland A (Figure 4). Wetland A is a riverine wetland located along Voights Creek to the south and west of the main hatchery facilities. We also noted the presence of two vegetated depressional features on the site that appear to collect water from artificial sources as a result of human activities associated with the hatchery. One of these depressional features is an actively used pond within the hatchery facility (the "pollution abatement pond"). The other feature is a very small depression that was created as a result of grading and filling activities and artificial alterations to hydrology. Both of these features contain one or more of the wetland parameters but were not determined to qualify as wetlands for reasons described in the following sections.

We also made visual observations "over-the-fence" and noted a single possible wetland located off site to the northeast of the site, across part of a maintained field and a gravel private road. We visually estimated the extent of this wetland and the proximity of its nearest boundary to the site based on field observations and aerial photographs. Based on these estimates, this possible wetland is at least 80 feet from the northeastern corner of the hatchery parcel. Agriculture is the dominant land use in the buffer for this feature and a gravel road is also present within the buffer and between the feature and the site.

Wetland A

Wetland A is located immediately adjacent to Voights Creek, on a low terrace within the bankfull width of the creek (Figure 4). It is approximately 4,700 square feet in size. We established a single sample plot in this wetland, labeled SP-6 (Appendix D). Wetland A contains a hydrophytic riparian vegetation community dominated by: red alder (*Alnus rubra*) in the tree and shrub stratum; Scouler's willow (*Salix scouleriana*) in the shrub stratum; and Pacific bleeding heart (*Dicentra formosa*) and Himalayan blackberry (*Rubus armeniacus*) in the herbaceous stratum. It also contains the following sub-dominant species: red-osier dogwood (*Cornus sericea*), Pacific willow (*Salix lasiandra*), sword fern (*Polystichum munitum*) and Japanese knotweed (*Polygonum cuspidatum*).

Indicators of wetland hydrology were clearly present even though the soil was dry at the time of our site visit, which occurred in late summer. We noted the presence of primary indicators of wetland hydrology including sediment deposits and drift deposits. We also noted secondary indicators such as water-stained leaves and, notably, geomorphic position.

Soil within the wetland was comprised entirely of sand within the upper 20 inches. This presented a problematic soil condition with regard to this wetland parameter. Soil color was dark yellowish brown (10YR 4/4) and contained no redoximorphic features. This soil profile does not meet any of the standard indicators for hydric soils because of the lack of organic content, color indicative of neither gley nor depletion, and absence of redoximorphic concentrations or streaks of "stripped" soil material. However, because of the presence of both of the other wetland parameters, we considered this soil to qualify as hydric based on the "vegetated sand and gravel bars" problematic condition. This soil condition arises due to the annual scouring of existing soil and deposition of new soil material within the floodplain of a stream. Under these conditions, indicators of hydric soils do not have time to develop before the upper portion of the soil profile "turns over" each year.

Pollution Abatement Pond

The pollution abatement pond is located in the northeastern corner of the hatchery parcel (Appendix A). This pond was excavated in the late 1970s for the purposes of hatchery operation. The WDFW has

indicated that this pond is actively used for the discharge of wastewater from juvenile rearing ponds. Current use also includes dredging of sediments that settle out in order to actively maintain depth and water capacity. Although this pond contained all three wetland indicators, we did not consider it a wetland due to its artificial origin, active current use as a managed pond, and non-normal source of hydrology, as described below.

Approximately half of the excavated depression is occupied by an unvegetated open-water component where most of the water storage and active maintenance presumably occurs. We were able to establish a sample plot (SP-1) along the eastern fringe of the pond. This fringe contains hydrophytic vegetation including red alder (*A. rubra*), black cottonwood (*Populus balsamifera*), red-osier dogwood (*C. sericea*), Sitka willow (*Salix sitchensis*), creeping buttercup (*Ranunculus repens*), and yellow iris (*Iris pseudacorus*) as dominants with Watson's willow-herb (*Epilobium ciliatum*), reed canarygrass (*Phalaris arundinacea*) and bittersweet nightshade (*Solanum dulcamara*) as sub-dominants.

The pond was inundated at the time of our site visit and soil at the fringe was saturated with a high water table. Sources of hydrology within the pond are two-fold: a culvert that appears to be associated with off-site pasture drainage discharges to the northern end of the pond and the hatchery pumps water from the rearing ponds into it for pollution abatement. The water level within the pond is also artificially maintained at its southern end, where a concrete overflow structure limits outflow and maintains the impoundment. Although indicators for wetland hydrology were present, hydrology within this pond was determined to be artificially maintained for the purposes of hatchery operation.

The soil profile in our sample plot revealed loam with a very dark greenish gray (10Y 3/1) matrix in the upper 2 inches that contained many (40 percent) prominent dark yellowish brown (10YR 4/4) redoximorphic concentrations. From 2 to 5 inches depth, the matrix was weak red (2.5YR 4/2) in color with many (20 percent) prominent dark yellowish brown (10 YR 4/6) redoximorphic concentrations. From 5 inches to the maximum depth of our soil plot (20 inches), the soil was again dark greenish gray (10GY 3/1) and lacked redoximorphic features. The presence of gley and redoximorphic concentrations in the soil profile clearly confirmed indicators of hydric soils. However, this soil material has likely been altered due to discharge of waste sediments from fish ponds during normal operation of the fish hatchery and development of hydric soils as a result of artificial inundation and saturation.

Small Vegetated Depression

We observed a small (approximately 1,000 square feet) depression west of the single-family residence located near the northern boundary of the hatchery parcel. This depression overlaps part of the septic drain field for the adjacent single-family residence and has been artificially created as a result of cut and fill activities over many years of hatchery operation. In particular, alteration has included the disposal of dredge material adjacent to the depression. This has created exaggerated topography which encourages water to run off and collect in the depression. We established a sample plot (SP-4; Appendix D; Figure 4) within the depression to document the conditions. Vegetation is dominated by weedy species including Himalayan blackberry (*R. armeniacus*), creeping buttercup (*R. repens*), soft rush (*Juncus effuses*), and, to a lesser extent, velvet grass (*Holcus lanatus*) and reed canarygrass (*P. arundinacea*). Black cottonwood (*P. balsamifera*) saplings are also dominant. Hydrology has been altered due to topographic alteration and the overlap of this depression with the septic drain field from the residence, which likely provides a continuous seepage of moisture into it. Indicators of hydrology were marginal but included the minimum requirement of two secondary indicators: geomorphic position and FAC-neutral test. Soils from 0 to 12 inches (at which point we had shovel refusal) were very dark grayish brown (10YR 3/2) with common (7 percent) distinct brown (7.5YR 4/4) redoximorphic concentrations, which have likely developed as a

result of alterations to hydrology. We did not delineate this as a wetland because of its small size, artificial topographic origin, and artificial source of hydrology which has led to the development of positive indicators of the three wetland parameters.

Uplands

Two of our sample plots were established in upland areas within the site, confirming the lack of wetland parameters in these areas and describing upland habitat in general. These sample plots were labeled SP-7 and SP-8 and were located in forested areas in the western portion of the site (Figure 4; Appendix D). Both of these sample plots clearly confirmed non-wetland conditions.

The forested area in the western portion of the site contains an overstory of red alder (*A. rubra*) and black cottonwood (*P. balsamifera*) trees. In one area (SP-6), the understory is dominated by red-osier dogwood (*C. sericea*), field horsetail (*E. arvense*), and Pacific bleeding heart (*D. formosa*), resulting in a positive indicator of hydrophytic vegetation for both the dominance and prevalence tests. However, indicators of wetland hydrology and hydric soils were completely lacking. Other forested areas are dominated by upland species such as Himalayan blackberry (*R. armeniacus*), stinging nettle (*Urtica dioica*) and Pacific bleeding heart (*D. formosa*). Non-forested areas were generally dominated by field grasses or Himalayan blackberry (*R. armeniacus*) which comprises the riparian vegetation along much of Voights Creek within this parcel. Soils throughout these uplands were dark grayish brown (2.5Y 4/2) or olive brown (2.5Y 4/4) sandy loam that completely lacked any indicators of hydric soils.

FISH AND WILDLIFE HABITAT

Wildlife Observations

We directly observed the presence of numerous Chinook salmon in Voights Creek during our field visits on September 10 and 11, 2008. We also observed an osprey (*Pandion haliaetus*) perched on a utility pole overlooking the adult holding pond on September 11, 2008. We did not observe any evidence that osprey are nesting on the site, but the availability of food resources in Voights Creek and at the hatchery likely attract them regularly for foraging. This species is not listed under the ESA by the federal agencies (NOAA 2008, USFWS 2007) but is considered a state monitor species by the WDFW (WDFW 2008c) and is considered a "species of local importance" by Pierce County (PCC 18E.40.020 § C.2).

Streams

Voights Creek is located adjacent to, and partially within, the site boundaries, as shown on USGS, WDFW (2008a, 2008b) and WDNR (2008b) map sources. Voights Creek is also identified as a shoreline of the state according to Pierce County (2007) and the Revised Code of Washington (RCW) 90.58.030. We identified and flagged the OHWM along the entire north side of the stream adjacent to the site, as well as on the south side of the stream where the hatchery site parcel extends across Voights Creek. Photographs of the stream are included in Appendix C.

Several structures and modifications are present within the channel of Voights Creek. A fish ladder and steel dam isolate Voights Creek from the hatchery adult holding pond where it has been necessary to construct these facilities for hatchery operation (Appendices A and B and Figure 4). On the opposite shore, a steel sheet pile has been installed to retain the bank and limit the flow of Voights Creek during high water events and it appears that mechanical redistribution of gravel streambed material has been performed in order to constrict the flow of the creek during salmon up-migration events in the late summer and fall. The OHWM of the creek is generally defined by these structures where they exist. To the east and west of the fish ladder, riprap and the abandoned bridge footing from the former SR 162

bridge over Voights Creek define the OHWM for approximately 50 feet to the east of the dam structure and 100 feet to the west of the fish ladder. Beyond these areas, the stream is characterized by a fairly abrupt bank in most areas except where Wetland A (discussed previously) occurs. This bank may have been historically built up and reinforced using natural materials (rock and dirt).

The riparian corridor immediately adjacent to existing hatchery facilities is devoid of vegetation for approximately 300 feet along the north shore and approximately 100 feet along the south shore. Riparian vegetation to the east of the site is largely intact and provides good stream shading, fish habitat and nutrient input to the freshwater aquatic ecosystem. Dominant riparian vegetation in this area includes willows (*Salix* spp.), black cottonwood (*P. balsamifera*), red alder (*A. rubra*), and red-osier dogwood (*C. sericea*). Similar vegetation occurs discontinuously in the riparian corridor to the west of the fish ladder, but this area is broken by extensive areas dominated by Himalayan blackberry (*R. armeniacus*).

Adult Holding Pond

The adult holding pond (see Appendices A and C, and Figure 4) is an artificially created aquatic feature used to corral and contain returning salmon in order to propagate hatchery runs. This pond was historically excavated for hatchery operations and hydrology is currently regulated at both the inlet (at the north end) and outlet (adjacent to Voights Creek). The depth of the pond is maintained by regular dredging. The limit of the pond is defined by an abrupt edge within which excavation and dredging activities have been clearly confined. Vegetation surrounding the pond is comprised of mowed lawn. This feature is not considered a regulated fish and wildlife habitat due to its artificial origin, continued use and maintenance for hatchery operation, and carefully controlled hydrology.

WETLAND CLASSIFICATION AND BUFFERS

The Cowardin System (Cowardin *et al.* 1979) classifies Wetland A as a *Palustrine, Scrub-Shrub, Seasonally Flooded, Broad-Leaved Deciduous* (PSSC1) wetland. This classification indicates that scrub-shrub is the only vegetation class that exceeds 30 percent cover that surface and/or groundwater hydrology create seasonal flooding within the wetland, and that it is dominated by broad-leaved deciduous shrubs. This classification is based on our observations at the time of the site visit.

We also rated Wetland A according to the Washington State Wetland Rating System for Western Washington (Hruby 2004). This wetland is classified as Category III according to this system. The rating form is included as Appendix E to this report. It scored moderately low (10 points) for **water quality functions** because it has low *potential* to improve water quality due to lack of significant depressions within the wetland and relatively low-density vegetation cover yet does have the *opportunity* to improve water quality in the contributing basin which is characterized by agricultural practices. It also scored moderately low (10 points) for **hydrologic functions** because it lacks *potential* to perform this function due to its narrow width in relation to the stream channel and its relatively sparse vegetation, yet it does have the *opportunity* based on its landscape position above downstream areas that contain human structures and salmon spawning habitat. It also scored moderately low (11 points) for **habitat functions** because of its singular dominant vegetation class, moderate plant species richness, low habitat interspersion, and lack of special habitat features all of which limit its *potential* as habitat. On the other hand, the location of this wetland within a somewhat connected landscape adjacent to a riparian area and within a 1/2 mile of several other wetlands gave it a moderate score for *opportunity* to provide habitat. In summary, the wetland received 31 points on the rating form, marginally qualifying it as a Category III wetland.

Category III wetlands receive a base buffer width of 50 feet according to PCC 18E.30.060, which is increased to 80 feet for wetlands with low habitat scores adjacent to high impact land uses. This buffer is contained entirely within the buffer for Voights Creek, which is described in the following section. The buffer for this wetland is already developed and devoid of vegetation due to construction of the Voights Creek Hatchery at this location nearly 100 years ago.

The off-site wetland northeast of the hatchery parcel would likely be considered a Category III wetland also, which would likewise require an 80-foot buffer. This wetland is located over 80 feet away from the site and, therefore, should not affect proposed plans for the site.

STREAM TYPES AND BUFFERS

Voights Creek is considered a Type F1 stream requiring a 150-foot buffer according to PCC Table 18E.40.060 – Buffer Requirements. Type F1 streams include fish-bearing streams that support critical fish species, including those species listed in Table 2. The 150-foot buffer should be applied from the OHWM where there is no adjacent wetland and from the landward side of the adjacent wetland (Wetland A) described in this report. This buffer is shown on Figure 4. As with Wetland A, much of the buffer for Voights Creek has previously been developed as part of the Voights Creek Fish Hatchery and currently contains buildings, gravel and paved surfaces, and hatchery structures for fish rearing and propagation.

PROJECT IMPACTS AND MITIGATION

In the following sections, we provide discussion of the proposed project and how it may affect habitats and species. Specifically, we address the following topics:

- Proposed hatchery improvements,
- Planned habitat enhancement efforts,
- Summary of project impacts and mitigation, and
- Effects of the project on regulated species and habitats.

PROPOSED HATCHERY IMPROVEMENTS

Every effort has been made to locate proposed improvements and additions within the existing hatchery footprint. As can be seen in the Conceptual Hatchery Layout Plan, all proposed structures have been located within the existing limits of the footprint of the hatchery, which are shown in the Baseline Hatchery Layout Plan (Appendix A). As a result, the proposed improvements will not directly impact any critical areas nor result in degradation of native vegetation in regulated buffers. However, some alteration to mowed, landscaped, or otherwise cleared earth surfaces within the regulated buffer of Voights Creek and associated Wetland A will occur as a result of some of the proposed improvements. While these features will be placed within the existing hatchery footprint and will not result in degradation of native vegetation, they may alter stormwater flow and, thus water quality. These alterations are discussed in the following sections.

Adult Holding Ponds

The earthen pond currently used at the hatchery will be replaced with a concrete structure comprised of three separate ponds located partially within the footprint of the existing pond and extending into the area where the 1917 residence (which is to be removed) is currently located. This location is entirely within the existing hatchery footprint. The new ponds will displace some vegetated areas that contain mowed

grass, thereby contributing to a minor reduction in pervious surfaces for infiltration of stormwater and groundwater recharge. Storm precipitation will be retained within the rebuilt adult holding pond and will not be discharged to adjacent habitats. The overall footprint of the rebuilt pond will be less than the existing one. The northern-most end of the existing pond will be converted to a stormwater infiltration cell as part of Phase 1 and the perimeter will be landscaped with native vegetation as part of Phase 2. This will result in a net reduction in impervious surfaces overall and a consequent improvement to habitat quality. Therefore, this improvement is not expected to have negative impacts on wetland and fish and wildlife habitat functions.

Fish Ladder

A new fish ladder will be constructed connecting existing structures in Voights Creek to the new adult holding ponds. This fish ladder will be entirely located within the existing hatchery footprint in the location that is now the southern end of the existing adult holding pond.

Stream Bank Restoration

Reconstruction of the stream bank is proposed upstream of the outlet of the new fish ladder to Voights Creek. The stream bank adjacent to the existing adult holding pond is currently defined by sheet piling that isolates the adult holding pond from Voights Creek. With construction of new adult holding ponds located further from Voights Creek and a new fish ladder connecting Voights Creek to the new ponds, it will be necessary to rebuild the stream bank in this area. This provides the opportunity to enhance stream and riparian habitat at this location but will necessarily include a small amount of fill due to spatial constraints at the site (see Sheets 5, 6 and 7 in Appendix B).

Spawning Shed and Pump Station

These two structures will be constructed near the new adult holding ponds, in areas currently paved. Consequently, these structures are located entirely within the existing footprint of the hatchery and will not result in the creation of new impervious surfaces.

Pollution Abatement Pond

A new pollution abatement pond will be constructed to replace the existing one that is being converted to a stormwater cell. The new pond will be located in the northwest corner of the site in an area currently used for disposal of dredge material and characterized by weedy field grasses and compacted soils. This pond will be located entirely within the existing hatchery footprint but will result in the conversion of pervious ground surfaces to impervious ones. Storm precipitation that runs off the pond's fabric cover will be collected in a small dedicated stormwater vault next to the pond.

1917 Single-Family Residence

The existing 1917 residence on the hatchery parcel will be removed in its entirety and the space formerly occupied by it will be used for the new adult holding ponds

Stormwater Cells

Two new stormwater bio-infiltration cells will be used at the site to treat discharge from impervious surfaces including roads and other pavement. The existing pollution abatement pond will be converted to a stormwater bio-infiltration cell. An additional stormwater bio-infiltration cell will also be created in part of the area formerly occupied by the existing adult holding pond. Both of these stormwater cells are within the existing hatchery footprint. As a result of the proposed hatchery improvements, all impervious

paved surfaces at the site will be designed to discharge to one of these stormwater cells. This represents a dramatic improvement in stormwater management from current conditions at the site.

Rearing Ponds

The two existing rearing ponds will be replaced with two new ponds in approximately the same location as part of Phase 2 of this project. The new ponds will be slightly smaller than the existing ones and will be designed to improve hatchery operations, but will otherwise remain essentially the same.

Landscaping

Comprehensive landscaping is proposed throughout the site as part of Phase 2 of the project. Landscaping will utilize native species and will result in improvements to habitat values of vegetated areas within the footprint of the hatchery.

PLANNED HABITAT ENHANCEMENT EFFORTS

This section discusses planned stream bank and buffer enhancements that will contribute to improvement in wetland and fish and wildlife habitat functions. These enhancements are also designed to qualify as mitigation for the impacts described in the previous section.

Stream Bank Enhancement

Reconstruction of the stream bank is proposed adjacent to the new fish ladder (see Sheets 3 through 7 in Appendix B). The stream bank in this area is currently defined by steel structures (sheet piling). The sheet piling will be removed and the stream bank rebuilt using natural materials, including rocks and fill dirt. A small amount of fill (rock) below the OHWM will be required to anchor the stream bank restoration. After reconstruction of the stream bank and construction of the new fish ladder, the riparian area associated with the restored stream bank will be enhanced by planting it with native vegetation, which will improve habitat for aquatic species.

Buffer Enhancement

Invasive species control and re-vegetation with native species is proposed within the critical area buffers between the southern and western limits of the facility and Voights Creek, as well as in select areas within the hatchery footprint (Appendix A). This work is scheduled for Phase 2 because it is desirable to conduct vegetation enhancement efforts following the complete removal of on-site structures planned for Phases 1 and 2. Currently, much of the riparian buffer not occupied by structures is dominated by invasive species including Himalayan blackberry (*R. armeniacus*) in particular. Invasive species will be removed and then these areas, as well as those newly exposed as a result of structure removals, will be replanted with native species. We suggest using willows (*Salix* spp.), black cottonwood (*P. balsamifera*), red alder (*A. rubra*), and red-osier dogwood (*C. sericea*) in the riparian area immediately adjacent to Voights Creek. Upland areas further away from the creek will be planted with appropriate upland species such as black cottonwood (*P. balsamifera*), big-leaf maple (*Acer macrophyllum*), Douglas fir (*P. menziesii*), vine maple (*Acer circinatum*), red elderberry (*S. racemosa*), Indian plum (*Oemleria cerasiformis*), oceanspray (*Holodiscus discolor*), salal (*Gaultheria shallon*) and/or sword fern (*Polystichum munitum*).

SUMMARY OF PROJECT IMPACTS AND MITIGATION

All of the proposed hatchery improvements will occur within the existing footprint of the fish hatchery facility. The overall effect of these changes will be generally beneficial to fish and wildlife habitat. A summary of the project impacts, proposed mitigation, and net effects is presented in the following table.

Table 3. Summary of Project Impacts and Mitigation

Project Impact	Mitigation	Net Effect
1. Addition of impervious surfaces within the stream buffer due to construction of concrete structures.	• Reduction in total amount of impervious surfaces at the site. • Treatment of all stormwater runoff from paved surfaces at the site.	Total impervious surfaces within the stream buffer will increase minimally (by 199 square feet) while total impervious surfaces within the entire site will be reduced substantially (by 5,336 square feet). Upon project completion, stormwater from all impervious paved surfaces (55,553 square feet), but not roof drains, will be treated in stormwater cells, rather than discharging directly to Voights Creek. Under current conditions, stormwater runoff from paved surfaces (50,654 square feet) is discharged directly to Voights Creek. This net reduction of untreated stormwater discharging into Voights Creek will result in improvements to water quality.
2. Removal of some vegetation (mowed and/or degraded areas) associated with construction of the pollution abatement pond and adult holding ponds.	• Comprehensive landscaping throughout the site will employ native species with higher habitat value than existing vegetation.	Landscaping throughout the site will increase vegetation density in the stream buffer which will contribute to reducing flow velocity and improving water quality treatment in surface runoff during storm events. Landscaping will make use of native species appropriate to the habitat type which will result in higher habitat value for wildlife.
3. A small amount of fill (10.1 cubic yards) in the form of rock placed below the OHWM of Voights Creek to construct the new stream bank.	• Removal of the artificial vertical sheet pile wall that currently defines the OHWM of Voights Creek. • Restoration of the stream bank with natural materials (rock and dirt). • Planting riparian vegetation on the newly restored stream bank.	The highly artificial nature of the existing stream bank presents a degraded habitat condition. Restoring and planting the stream bank using natural materials and native vegetation will enhance riparian function and habitat value to aquatic species such as salmon and trout.

EFFECTS OF THE PROJECT ON REGULATED SPECIES AND HABITATS

The planned habitat enhancements are expected to more than make up for any negative project-related impacts, as described in the preceding sections. Regulated wetland and fish and wildlife habitat and buffers that exist on-site perform valuable functions to provide habitat, improve water quality, and/or reduce flooding downstream. A number of native fish species are known to occupy Voights Creek both up and downstream of the hatchery at various times throughout the year. The primary purpose of this project is to improve hatchery function and design, which is critical to perpetuating salmon stocks in the Puget Sound for recreational, economic and ecological benefit. In that way, this project will have an indirect positive benefit to regulated salmon species and other inhabitants of the Puget Sound ecoregion. Stream habitat and regulated buffers will be enhanced as part of this project, which will have direct positive benefits to not only salmon and other fish, but a variety of other species that may depend on, or be associated with, these habitats. Overall, this project will have net beneficial effects on regulated species and habitat.

CONCLUSIONS

The WDFW is planning significant upgrades to the Voights Creek Fish Hatchery, which are necessary in order to modernize hatchery structures and to improve their ability to meet salmon conservation goals. We identified, marked, and mapped a single regulated wetland feature, Wetland A, on the site, as well as Voights Creek, which is a regulated fish and wildlife habitat. We also estimated the categorization/typing appropriate to each habitat feature and estimated the regulated buffer that will be applied during the permit and project development process.

Proposed improvements at the hatchery will be located entirely within the existing footprint of the facility. However, some of these improvements will result in clearing of mowed vegetation and/or replacement of soil/vegetated surfaces with hatchery structures. Other improvements will reduce the footprint of hatchery structures and result in increased landscaping with native species. Stormwater management on the site will be improved by directing flow from impervious surfaces to properly designed stormwater cells. Stream bank and buffer enhancement will further contribute to increases in buffer function and will result in overall improvements for wetland and fish and wildlife habitat and species at the site.

LIMITATIONS

GeoEngineers has performed this critical areas report in general accordance with the scope and limitations of our proposal. Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices for critical areas reports including wetland delineation, fish and wildlife occurrence, and habitat assessment in this area at the time this report was prepared. No warranty or other conditions expressed or implied should be understood.

This report has been prepared for the exclusive use of MWH Americas, Inc., authorized agents, and regulatory agencies following the described methods and information available at the time of the work. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. The information contained herein should not be applied for any purpose or project except the one originally contemplated.

Wetland and OHWM boundaries, classifications and discussions are based on our understanding of the local, state, and federal regulations, and site conditions at the time of our work. The final boundary determinations and classifications for all critical areas discussed herein are to be made or verified by the appropriate jurisdictional agency.

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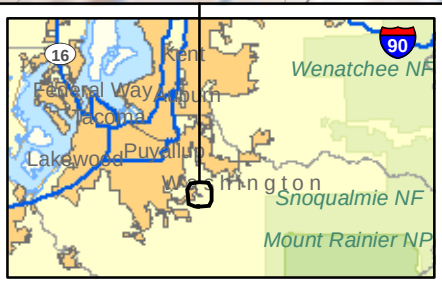

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Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

Voights Creek Hatchery
Orting, Washington

GEOENGINEERS

Figure 1

Map Revised: 1/30/09, DBC, KKS

Path: \\tac\Projects\3\3730099\GIS\373009900_F1_VicinityMap.mxd

Map Revised: 1/27/09, DBC

Path: \\tac\Projects\3\3730099\GIS\3730099902_F2_NWI.mxd

Site

Mapped Streams

National Wetland Inventory

Pierce County Wetland Inventory

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Notes:
1. The locations of all features shown are approximate.
2. This drawing is for infomation purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

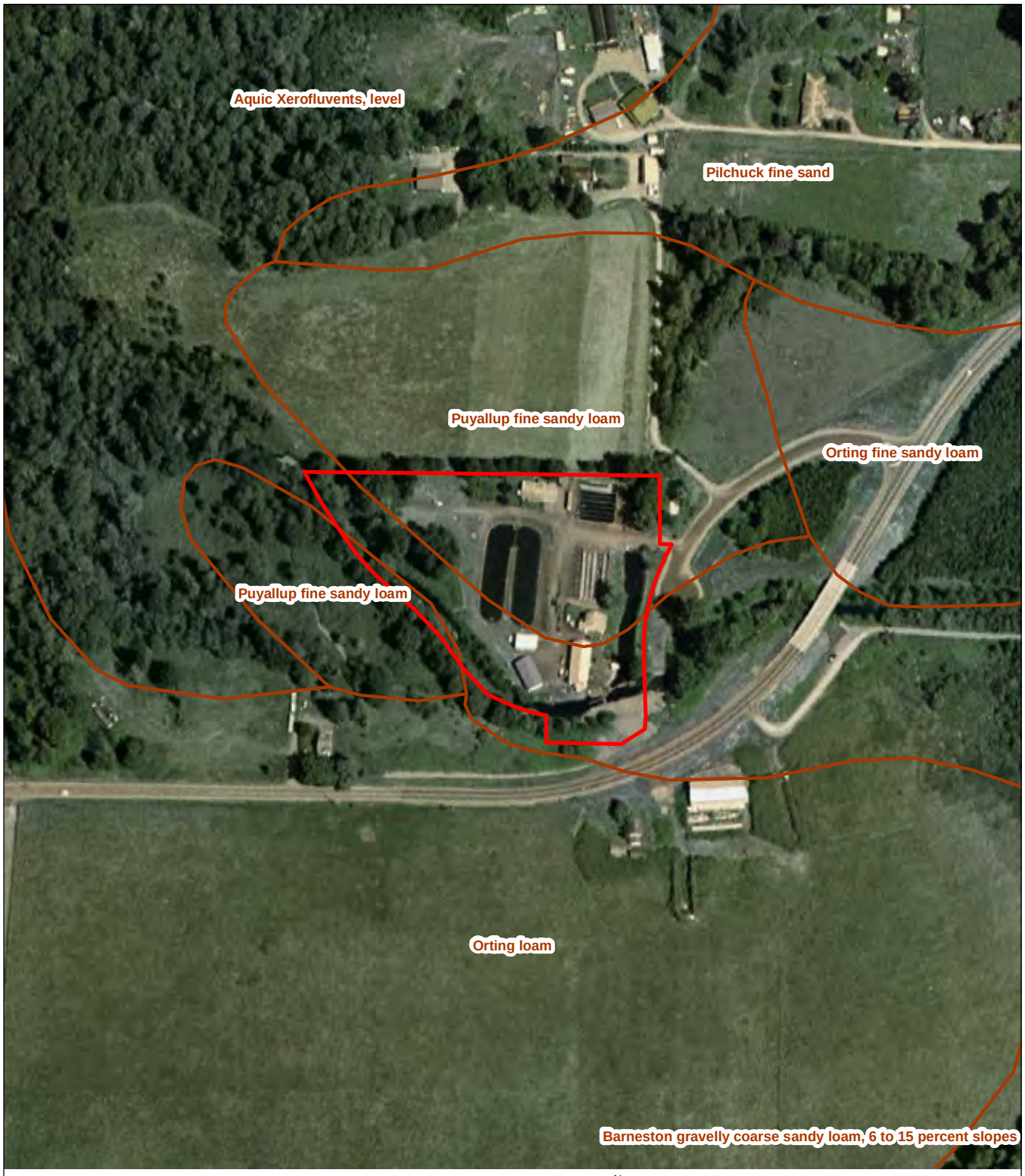
Reference: Aerial photo (2005) from ESRI I3 Imagery; streams from WDFW; wetlands from USFWS and Pierce County.

Wetlands Inventory

Voights Creek Fish Hatchery
Orting, Washington

GeoEngineers

Figure 2



Map Revised: 1/27/09, DBC

Path: \\tac\Projects\3\3730099\GIS\3730099902_F2_Soils.mxd

Site

Soil Map Units

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Notes:
1. The locations of all features shown are approximate.
2. This drawing is for infomation purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Aerial photo (2005) from ESRI I3 Imagery; soils data from NRCS.

NRCS Soil Survey

Voights Creek Fish Hatchery
Orting, Washington

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Figure 3

Legend

- Surveyed Parcel Boundaries
- Ordinary High Water Mark
- Wetland Features
- On-site Critical Area Buffer (150 ft.)

GPS Points

- Voights Creek Ordinary High Water Mark
- Sample Plot
- Wetland Flag

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Notes:
1. The locations of all features shown are approximate.
2. This drawing is for infomation purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Aerial Photograph from ESRI I3 Imagery (2005).

Critical Areas

Voights Creek Fish Hatchery
Orting, Washington

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Figure 4

Map Revised: 1/27/09, DBC

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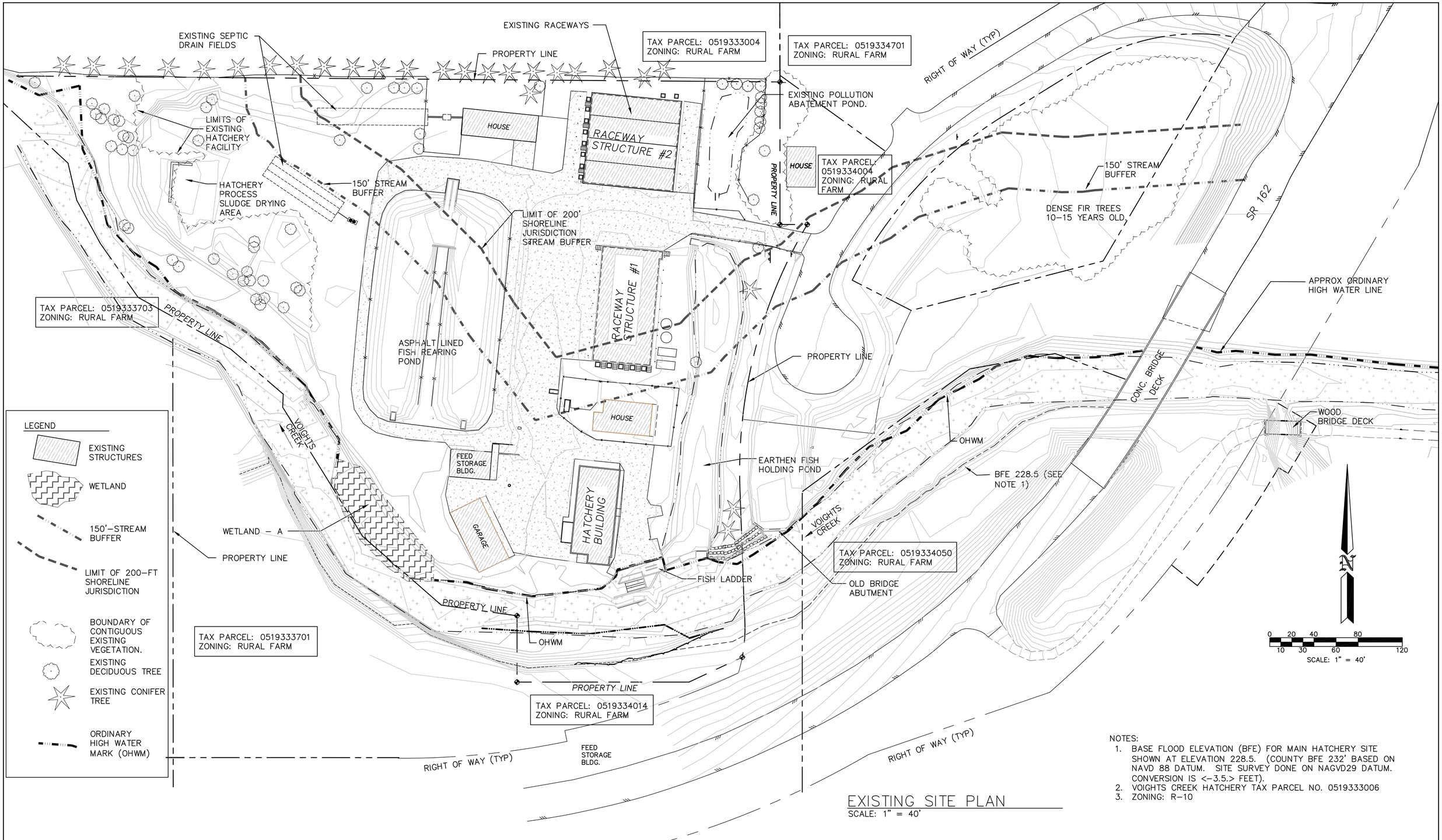
GeoEngineers

Appendix A
Site Plans



EXISTING SITE PLAN
SCALE: 1" = 40'

NOTES:
1. BASE FLOOD ELEVATION (BFE) FOR MAIN HATCHERY SITE SHOWN AT ELEVATION 228.5. (COUNTY BFE 232' BASED ON NAVD 88 DATUM. SITE SURVEY DONE ON NAGVD29 DATUM. CONVERSION IS <-3.5.> FEET).
2. VOIGHTS CREEK HATCHERY TAX PARCEL NO. 0519333006
3. ZONING: R-10

MWH

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

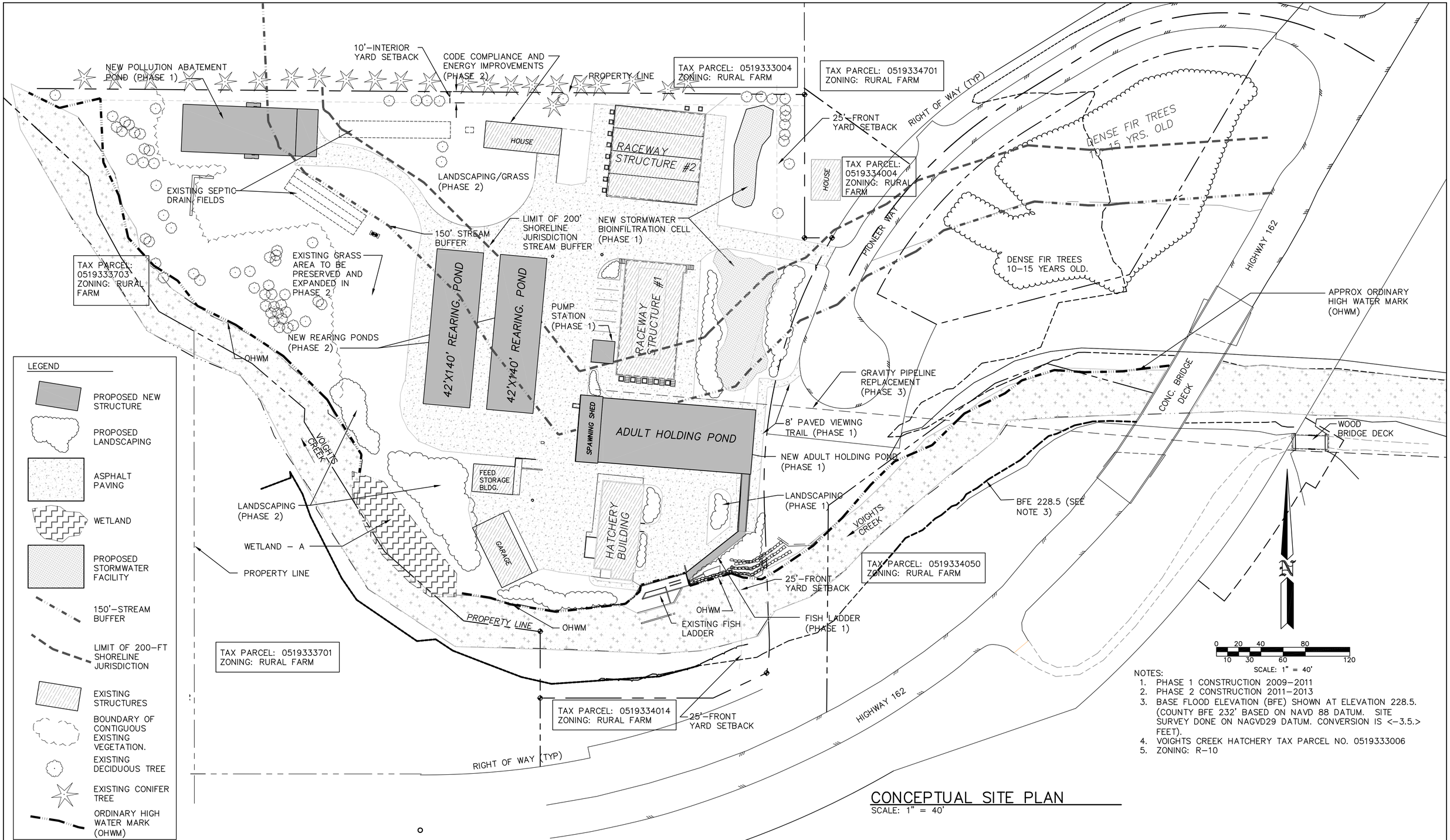
0 ——— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY S. RADFORD
CHECKED BY C. CUTTING
DRAWN BY S. RADFORD
DATE JANUARY 2009

VOIGHTS CREEK HATCHERY
HATCHERY RENOVATION
PHASE 1 & 2
EXISTING CONDITIONS PLAN

PROJECT NO. PE:H8: 08-1
SHEET 1 OF 2

FILE: \\Ussea5s01\BU20801\Projects\WDFW\Voights Creek Renovation - Ph 1\07 Design Phase\7.7 Drawings\PermittingSchematicSiteDesign\MODEL\VCH RevisedBaseline_BFE230.5.dwg
USER: swradford
DATE: Feb 23,2009 - 12:24pm



NOTES:
1. PHASE 1 CONSTRUCTION 2009–2011
2. PHASE 2 CONSTRUCTION 2011–2013
3. BASE FLOOD ELEVATION (BFE) SHOWN AT ELEVATION 228.5. (COUNTY BFE 232' BASED ON NAVD 88 DATUM. SITE SURVEY DONE ON NAGVD29 DATUM. CONVERSION IS <–3.5.> FEET).
4. VOIGHTS CREEK HATCHERY TAX PARCEL NO. 0519333006
5. ZONING: R–10

CONCEPTUAL SITE PLAN
SCALE: 1" = 40'

MWH

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

0 ——— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY S. RADFORD
CHECKED BY C. CUTTING
DRAWN BY S. RADFORD
DATE FEBRUARY 2009

VOIGHTS CREEK HATCHERY
HATCHERY RENOVATION
PHASE 1 & 2
CONCEPTUAL SITE PLAN

PROJECT NO. PE: H8:08–1
SHEET 2 OF 2

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DATE: Feb 23,2009 – 12:21pm

GeoEngineers

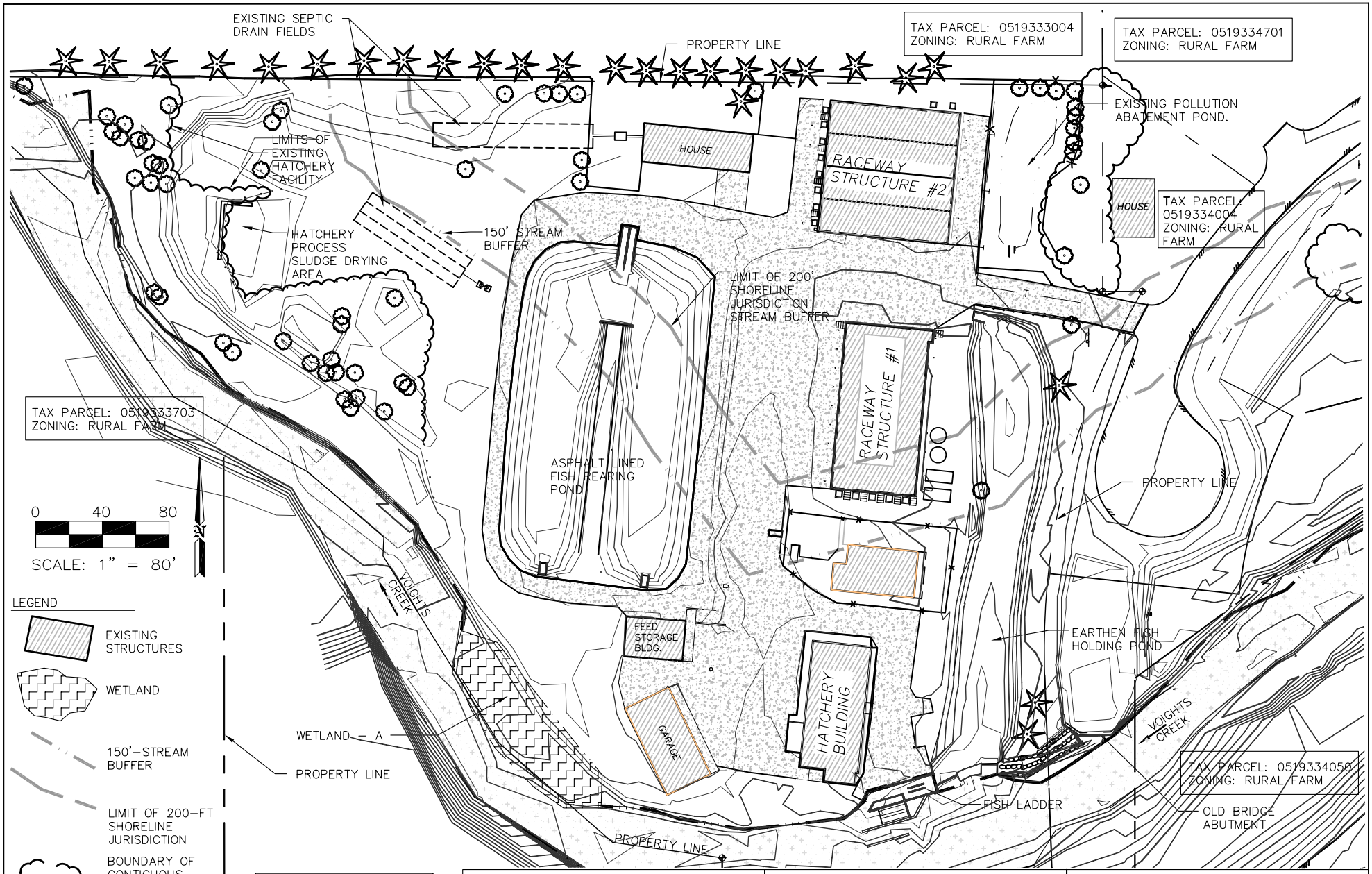
Appendix B
JARPA Drawings

DIRECTIONS:
FROM ORTING, WA FOLLOW SR 162 SOUTHEAST FOR APPROXIMATELY 1.8 MILES. TURN LEFT ON VOIGHTS CREEK HATCHERY ROAD EAST .1 MILES, TO DEAD END AT HATCHERY.

LOCATON:
SE 1/4 OF THE SW 1/4 OF SECTION 33, TOWNSHIP 19N, RANGE 05E AND THE SW 1/4 OF THE SE 1/4 OF SECTION 33, TOWNSHIP 19N, RANGE 05E OF THE WILLAMETTE MERIDIAN.

LATITUDE: 47 DEG 05' 00" N
LONGITUDE: 122 DEG 10' 39" W

PURPOSE FISH HATCHERY RENOVATION & CONSTRUCTION OF NEW FISH HOLDING POND, FISH LADDER & POLLUTION ABATEMENT POND DATUM: ADJACENT PROPERTY OWNERS	NAME: FIGURE 1 VICINITY MAP SCALE: 1:24,000 REFERENCE #: SITE LOCATION ADDRESS: VOIGHTS CREEK HATCHERY 19112 PIONEER WAY ORTING, WA 98360	PROPOSED WORK: CONSTRUCTION OF NEW ADULT FISH HOLDING POND AND FISH LADDER IN: STREAM BANK NEAR/AT: ORTING COUNTY: PIERCE STATE: WA SHEET: 1 of 7



PURPOSE

FISH HATCHERY RENOVATION & CONSTRUCTION OF NEW FISH HOLDING POND, FISH LADDER & POLLUTION ABATEMENT POND

DATUM: **NAVD 88**

ADJACENT PROPERTY OWNERS

NAME:

FIGURE 2 EXISTING CONDITIONS SCALE 1"=80'

REFERENCE #:

SITE LOCATION ADDRESS:

VOIGHTS CREEK HATCHERY
19112 PIONEER WAY
ORTING, WA 98360

PROPOSED WORK:

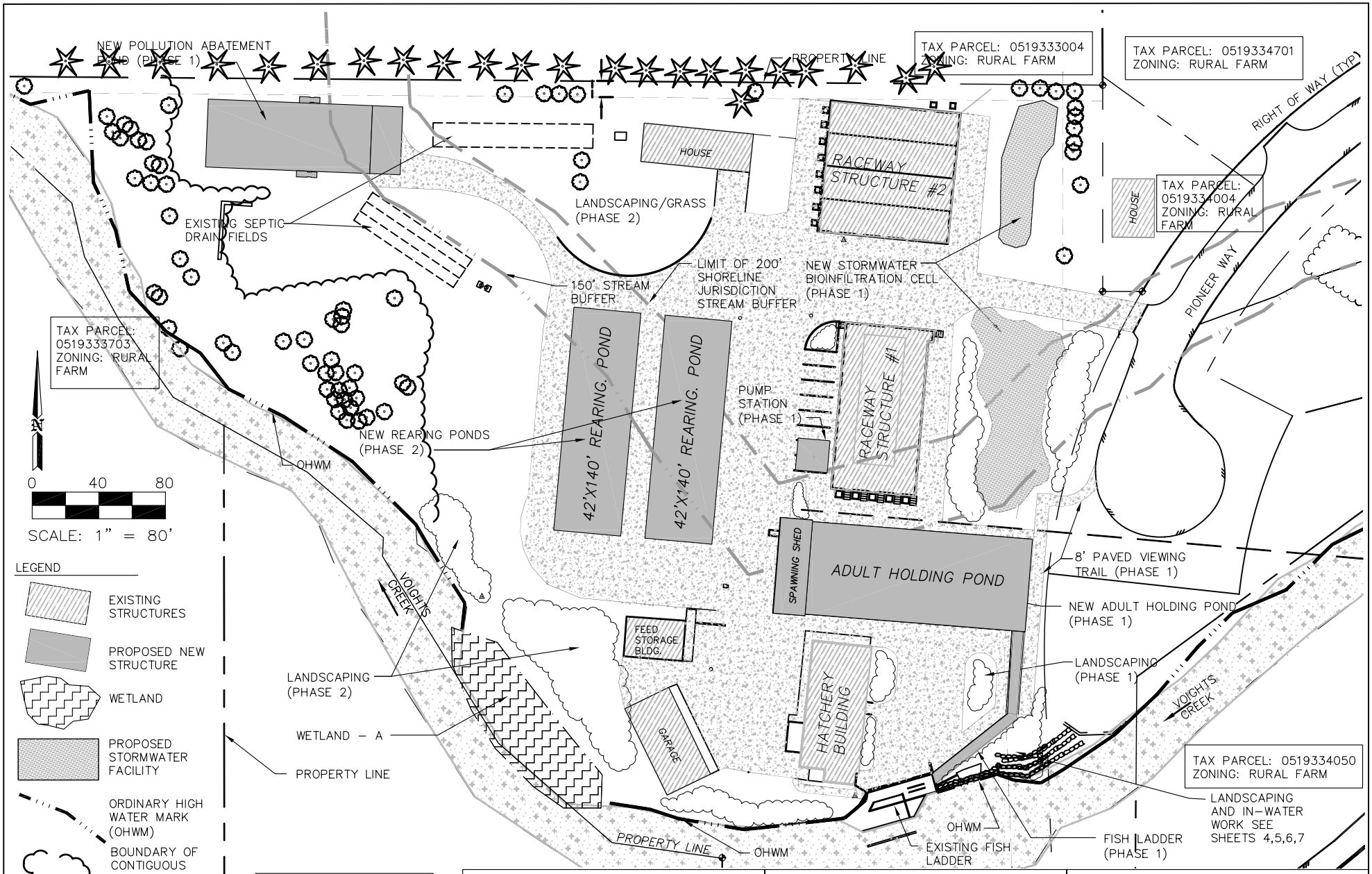
CONSTRUCTION OF NEW ADULT FISH HOLDING POND AND FISH LADDER

IN: **STREAM BANK**

NEAR/AT: **ORTING**

COUNTY: **PIERCE** STATE: **WA**

SHEET: 2 of 7



PURPOSE

FISH HATCHERY RENOVATION & CONSTRUCTION OF NEW FISH HOLDING POND, FISH LADDER & POLLUTION ABATEMENT POND

DATUM: **NAVD 88**

ADJACENT PROPERTY OWNERS

NAME:

FIGURE 3 PROPOSED SCHEMATIC DESIGN
SCALE 1" = 80'

REFERENCE #:

SITE LOCATION ADDRESS:

VOIGHTS CREEK HATCHERY
19112 PIONEER WAY
ORTING, WA 98360

PROPOSED WORK:

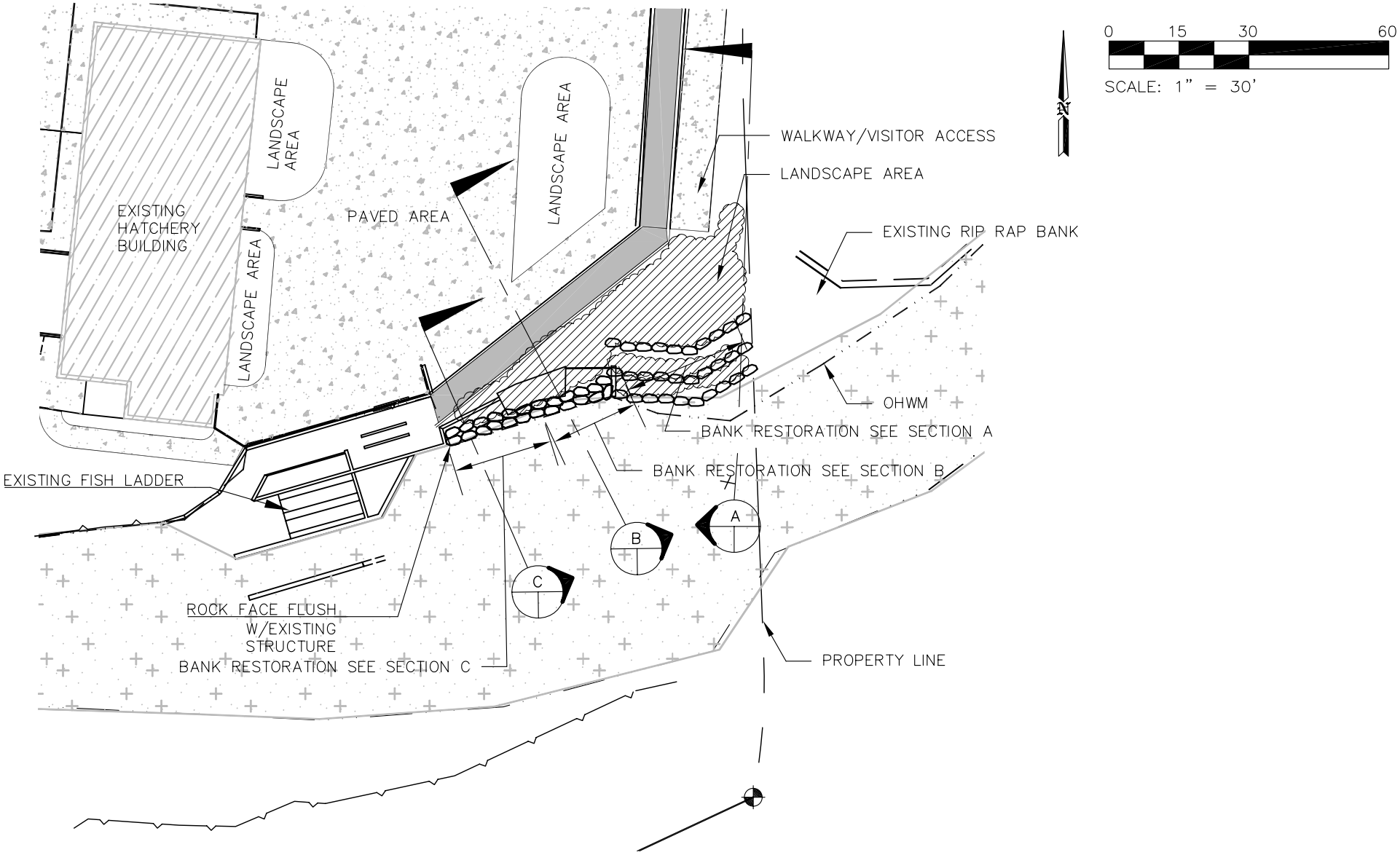
CONSTRUCTION OF NEW ADULT FISH HOLDING POND AND FISH LADDER

IN: **STREAM BANK**

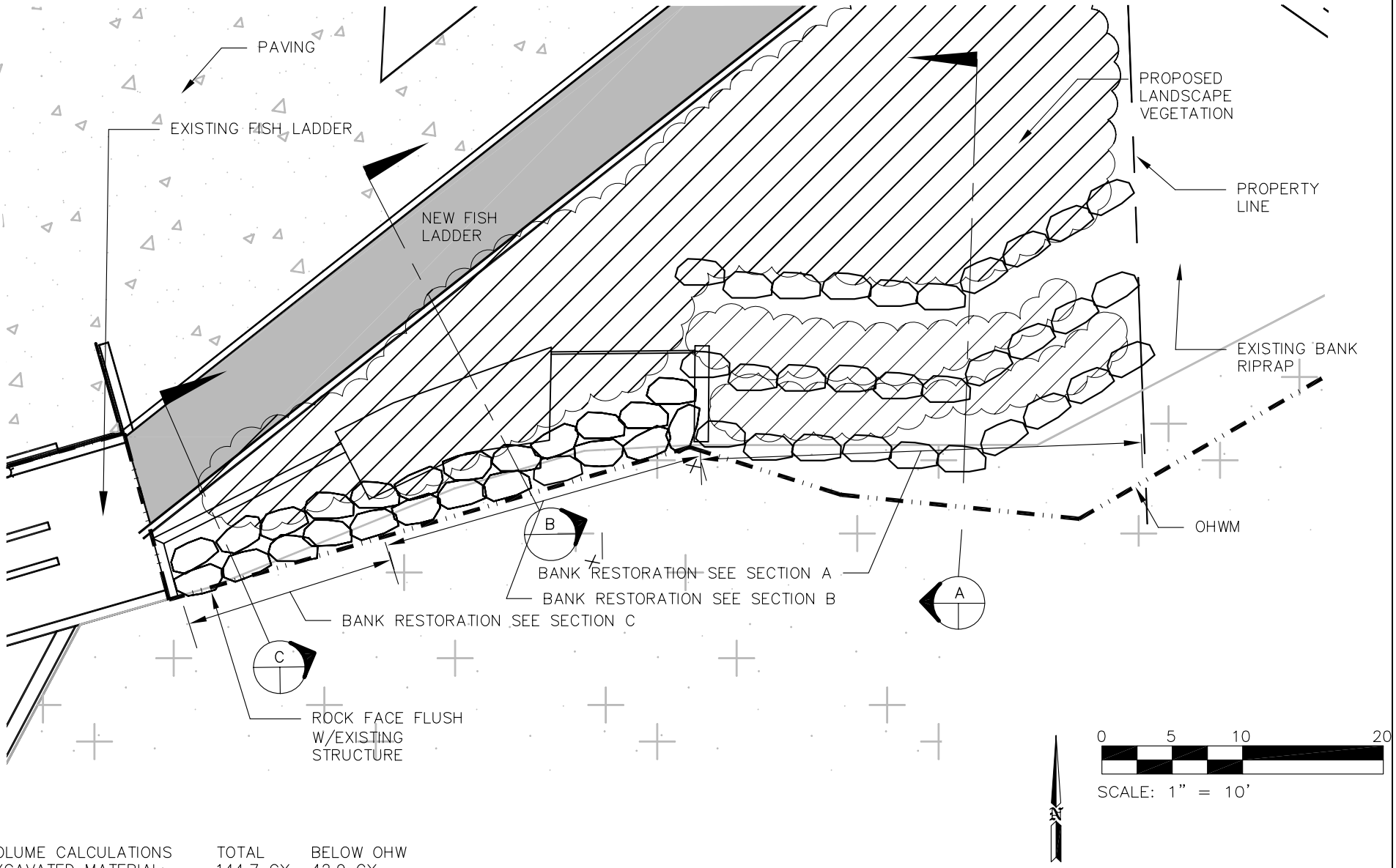
NEAR/AT: **ORTING**

COUNTY: **PIERCE** STATE: **WA**

SHEET: 3 of 7



PURPOSE	NAME:	PROPOSED WORK:
FISH HATCHERY RENOVATION & CONSTRUCTION OF NEW FISH HOLDING POND, FISH LADDER & POLLUTION ABATEMENT POND DATUM: **NAVD 88** ADJACENT PROPERTY OWNERS	**FIGURE 4 FISH LADDER PLAN & BANK RESTORATION PLAN SCALE 1'= 30'-0"** REFERENCE #: SITE LOCATION ADDRESS: **VOIGHTS CREEK HATCHERY 19112 PIONEER WAY ORTING, WA 98360**	**CONSTRUCTION OF NEW ADULT FISH HOLDING POND AND FISH LADDER** IN: **STREAM BANK** NEAR/AT: **ORTING** COUNTY: **PIERCE** STATE: **WA** SHEET: 4 of 7



VOLUME CALCULATIONS	TOTAL	BELOW OHW
EXCAVATED MATERIAL:	144.7 CY	42.9 CY
FILL MATERIAL:	155.3 CY	53 CY
BANK PROTECTION STONE:	118.9 CY	53 CY.
NET FILL:	10.6 CY	10.1 CY

PURPOSE

FISH HATCHERY RENOVATION & CONSTRUCTION OF NEW FISH HOLDING POND, FISH LADDER & POLLUTION ABATEMENT POND

DATUM: **NAVD 88**

ADJACENT PROPERTY OWNERS

NAME:

FIGURE 5 FISH LADDER PLAN & BANK RESTORATION PLAN SCALE 1'= 10'-0"

REFERENCE #:

SITE LOCATION ADDRESS:

VOIGHTS CREEK HATCHERY
19112 PIONEER WAY
ORTING, WA 98360

PROPOSED WORK:

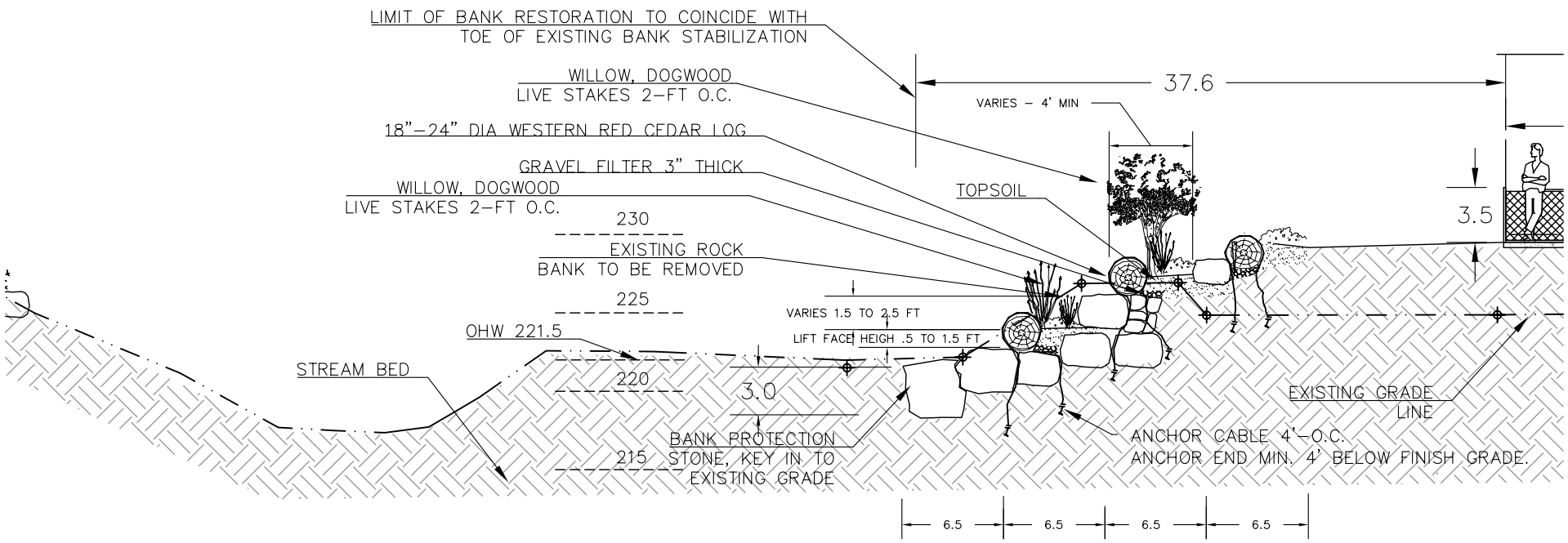
CONSTRUCTION OF NEW ADULT FISH HOLDING POND AND FISH LADDER

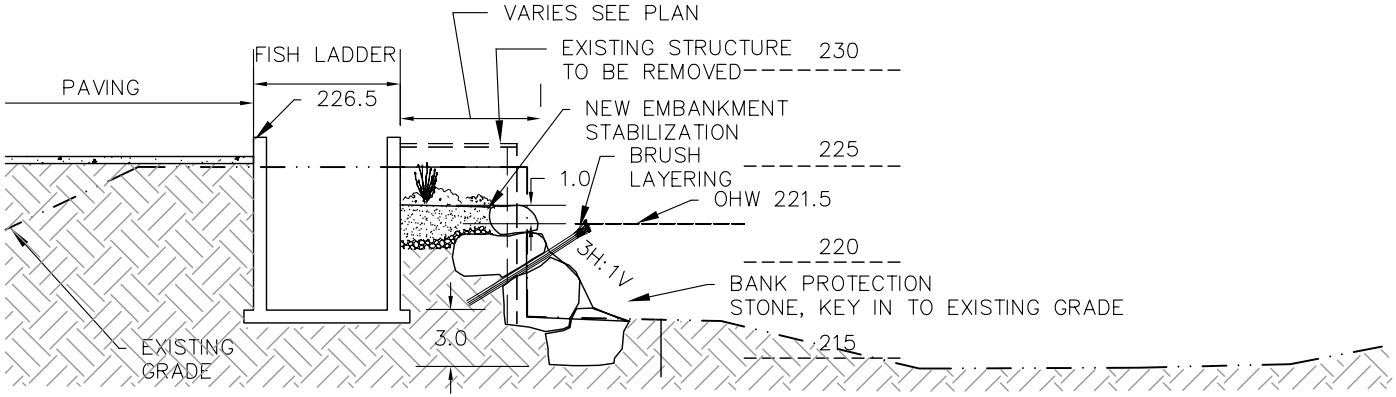
IN: **STREAM BANK**

NEAR/AT: **ORTING**

COUNTY: **PIERCE** STATE: **WA**

SHEET: 5 of 7





SECTION VIEW B-B

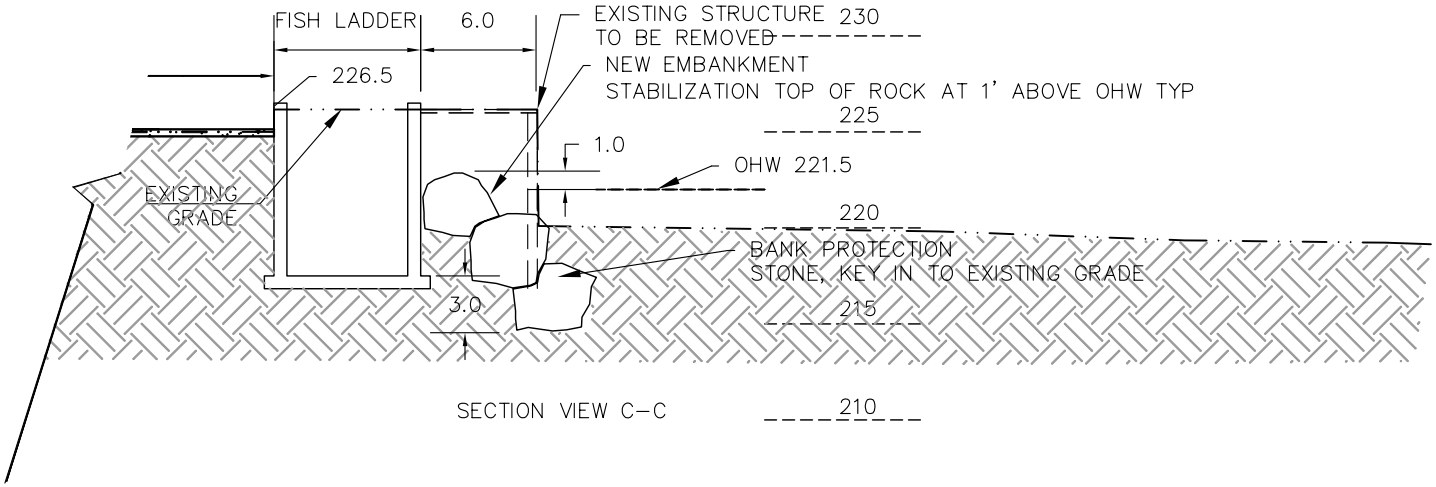
NOTES:

1. THE EXISTING STREAM BANK IN THE AREA OF THE PROPOSED RENOVATION IS COMPRISED OF LARGE BOULDER RIP RAP AND SHEET PILES WITH NO RIPARIAN VEGETATION.

2. THE PROPOSED STREAM BANK RESTORATION WILL INTERLAY RIP RAP, LARGE LOGS, SOIL AND RIPARIAN VEGETATION (WILLOW, DOGWOOD, SALAL, INDIAN PLUM, SWORD FIRN AND OCIAN SPRAY) TYPICAL OF THAT FOUND ALONG VOIGHTS CREEK.

3. THE CONSTRUCTION WILL BE COMPLETED WITH TYPICAL MECHANIZED CONSTRUCTION EQUIPMENT INCLUDING A SMALL EXCAVATOR, AND HAND TOOLS.

PURPOSE	NAME:	PROPOSED WORK:
FISH HATCHERY RENOVATION & CONSTRUCTION OF NEW FISH HOLDING POND, FISH LADDER & POLLUTION ABATEMENT POND	**FIGURE 6** **BANK RESTORATION SECTIONS** **SCALE 1"= 10'-0"**	**CONSTRUCTION OF NEW ADULT FISH HOLDING POND AND FISH LADDER**
DATUM: **NAVD 88**	REFERENCE #:	IN: **STREAM BANK**
ADJACENT PROPERTY OWNERS	SITE LOCATION ADDRESS: **VOIGHTS CREEK HATCHERY** **19112 PIONEER WAY** **ORTING, WA 98360**	NEAR/AT: **ORTING** COUNTY: **PIERCE** STATE: **WA**
		SHEET: 6 of 7



PURPOSE	NAME:	PROPOSED WORK:
FISH HATCHERY RENOVATION & CONSTRUCTION OF NEW FISH HOLDING POND, FISH LADDER & POLLUTION ABATEMENT POND DATUM: NAVD 88 ADJACENT PROPERTY OWNERS	FIGURE 7 BANK ENHANCEMENT SECTIONS SCALE 1" = 10'–0" REFERENCE #: SITE LOCATION ADDRESS: VOIGHTS CREEK HATCHERY 19112 PIONEER WAY ORTING, WA 98360	CONSTRUCTION OF NEW ADULT FISH HOLDING POND AND FISH LADDER IN: STREAM BANK NEAR/AT: ORTING COUNTY: PIERCE STATE: WA SHEET: 7 of 7

GeoEngineers

APPENDIX C
PHOTOGRAPHS

APPENDIX C
PHOTOGRAPHS

Photograph 1
Voights Creek in the eastern portion of the site, upstream of the fish ladder.

Photograph 2
Bank armoring, the fish ladder and fish weir in Voights Creek, viewed looking west (downstream) during moderately high flow.

Photograph 3
Hatchery structures, including the weir in Voights Creek and the fish ladder, viewed looking west (downstream) during late summer low flow.

Photograph 4
Hatchery structures in Voights Creek viewed looking east (upstream).

Photograph 5
A view of the fish ladder and steel structures from a vantage over the earthen adult holding pond (looking south). These structures separate the adult holding pond from Voights Creek, which is out of sight behind the structures.

Photograph 6
The adult holding pond viewed from near the fish ladder and looking to the north. This photo was taken from approximately the same location as Photograph 5, facing the opposite direction.

Photograph 7
Wetland A adjacent to Voights Creek. Willows comprise the dominant vegetation.

Photograph 8
Voights Creek in the western portion of the site. Note the bank armoring and dominance of Himalayan blackberry in the riparian zone. Re-planting the riparian area is proposed in Phase 2.

Photograph 9
The pollution abatement pond viewed from the hatchery access road.

Photograph 10
A small vegetated depression west of an existing residence near the northern site boundary. The fields in the background are off site.

APPENDIX D
SAMPLE PLOT DATA SHEETS

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/10/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-1

Investigator(s): David Conlin, Bruce Stirling Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): floodplain Local Relief (concave, convex, none:) concave Slope (%): 0

Subregion (LLR): A Lat: 47º 05' 01" N Long: 122º 10' 38" W Datum: NAD 83

Soil Map Unit Name: Puyallup fine sandy loam NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☑ Soil ☑ Hydrology significantly disturbed? Are "normal circumstances" present? ☐ Yes ☑ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☑ Yes ☐ No	Is the sampled area within a Wetland? ☐ Yes ☑ No
Hydric Soil Present?	☑ Yes ☐ No	
Weltand Hydrology Present?	☑ Yes ☐ No	

Remarks: Not considered a wetland because soil and, in particular, hydrology characteristics are a result of continued hatchery operations rather than naturally-occuring conditions.

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	30	Y	FAC
2. Populus balsamifera	20	Y	FAC
3.			
4.			
	50	= Total Cover	
Sapling/Shrub Stratum			
1. Cornus sericea	10	Y	FACW
2. Salix sitchensis	5	Y	FACW
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum			
1. Ranunculus repens	30	Y	FACW
2. Iris pseudacorus	40	Y	OBL
3. Epilobium ciliatum	10	N	FACW-
4. Solanum dulcamara	5	N	FAC+
5. Phalaris arundinacea	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	90	= Total Cover	
Woody Vine Stratum (Plot Size:_____)			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum _____			

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:	
OBL Species	40	x 1 =	40	
FACW Species	60	x 2 =	120	
FAC Species	55	x 3 =	165	
FACU Species	0	x 4 =	0	
UPL Species	0	x 5 =	0	
Column Totals:	155	(A)	325	(B)

Prevalence Index = B/A = 2.10

Hydrophytic Vegetation Indicators:

☑ Dominance test is >50%

☑ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 Y 3/1	60	10 YR 4/4	40	C	M	loam	
2-5	2.5 YR 4/2	80	10 YR 4/6	20	C	M	loam	
5-20	10 GY 3/1	100						Gley

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☑ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydrophytic Soil Present? ☑ Yes ☐ No

Remarks: Discharge of waste sediments from fish ponds during normal operating procedures of the fish hatchery have altered soil within this artificial ponded area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☐ Yes	☑ No	Depth (inches):	
Water Table Present?	☑ Yes	☐ No	Depth (inches):	12
Saturation Present? (includes capillary fringe)	☑ Yes	☐ No	Depth (inches):	7

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample plot is located in artificially-excavated and maintained depression. Hydroperiod and water level artificially increased by discharge of waste water from hatchery fa

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/10/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-2

Investigator(s): David Conlin, Bruce Stirling Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): Floodplain Local Relief (concave, convex, none:) flat Slope (%): 0

Subregion (LLR): A Lat: 47º 05' 01" N Long: 122º 10' 33" W Datum: NAD 83

Soil Map Unit Name: Orting fine sandy loam NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "normal circumstances" present? ☑ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☐ Yes	☑ No	Is the sampled area within a Wetland? ☐ Yes ☑ No
Hydric Soil Present?	☐ Yes	☑ No	
Weltand Hydrology Present?	☐ Yes	☑ No	

Remarks:

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pseudotsuga menziesii*	100	Y	FACU
2.			
3.			
4.			
	100	= Total Cover	
Sapling/Shurb Stratum			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species		x 1 =	0
FACW Species		x 2 =	0
FAC Species		x 3 =	0
FACU Species	100	x 4 =	400
UPL Species		x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

☐ Dominance test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☐ Yes ☑ No

Remarks:

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	**10 YR 4/3**	**100**						

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydrophytic Soil Present? ☐ Yes ☑ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☐ Yes	☐ No	Depth (inches): _____
Water Table Present?	☐ Yes	☐ No	Depth (inches): _____
Saturation Present? (includes capillary fringe)	☐ Yes	☐ No	Depth (inches): _____

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/10/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-3

Investigator(s): David Conlin, Bruce Stirling Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): Floodplain Local Relief (concave, convex, none:) flat Slope (%): 0

Subregion (LLR): A Lat: 47º 05' 01" N Long: 122º 10' 35" W Datum: NAD 83

Soil Map Unit Name: Puyallup fine sandy loam NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "normal circumstances" present? ☑ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☐ Yes ☑ No	Is the sampled area within a Wetland? ☐ Yes ☑ No
Hydric Soil Present?	☐ Yes ☑ No	
Weltand Hydrology Present?	☐ Yes ☑ No	

Remarks:

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	75	Y	FAC
2.			
3.			
4.			
	75	= Total Cover	
Sapling/Shurb Stratum			
1. Rubus armeniacus	20	Y	FACU
2. Sambucus racemosa	20	Y	FACU
3.			
4.			
5.			
	40	= Total Cover	
Herb Stratum			
1. Equisetum arvense	25	Y	FAC
2. Phalaris arundinacea	35	Y	FACW
3. Galium aparine	15	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum			

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: **6** (B)

Percent of dominant Species That are OBL, FACW, or FAC: **50** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species		x 1 =	0
FACW Species	35	x 2 =	70
FAC Species	100	x 3 =	300
FACU Species	55	x 4 =	220
UPL Species		x 5 =	0
Column Totals:	190 (A)		590 (B)

Prevalence Index = B/A = 3.11

Hydrophytic Vegetation Indicators:

☐ Dominance test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☐ Yes ☑ No

Remarks:

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	**10 YR 4/3**	**100**						

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydrophytic Soil Present? ☐ Yes ☑ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ☐ Yes ☐ No Depth (inches): _____

Water Table Present? ☐ Yes ☐ No Depth (inches): _____

Saturation Present? ☐ Yes ☐ No Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/10/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-4

Investigator(s): David Conlin, Bruce Stirling Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): floodplain Local Relief (concave, convex, none:) concave Slope (%): 0

Subregion (LLR): A Lat: 47º 05' 01" N Long: 122º 10' 44" W Datum: NAD 83

Soil Map Unit Name: Puyallup fine sandy loam NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☑ Soil ☑ Hydrology significantly disturbed? Are "normal circumstances" present? ☐ Yes ☑ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☑ Yes ☐ No	Is the sampled area within a Wetland? ☐ Yes ☑ No
Hydric Soil Present?	☑ Yes ☐ No	
Weltand Hydrology Present?	☑ Yes ☐ No	

Remarks: Not considered a wetland because soil and, in particular, hydrology characteristics are a result of artifically-created conditions, including discharge of septic waste into a human-created depression. Even including human contributions, hydrology parameter only marginally confirmed. Depression is furthermore well below the regulatory size threshold in Pierce County.

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum			
1. *Populus balsamifera*	10	Y	FAC
2. *Rubus armeniacus*	5	Y	FACU
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum			
1. *Ranunculus repens*	40	Y	FACW
2. *Juncus effusus*	40	Y	FACW
3. *Holcus lanatus*	20	N	FAC
4. *Phalaris arundinacea*	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	105	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum			

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:
OBL Species		x 1 =	0
FACW Species	85	x 2 =	170
FAC Species	30	x 3 =	90
FACU Species	5	x 4 =	20
UPL Species	0	x 5 =	0
Column Totals:	120	(A)	280 (B)

Prevalence Index = B/A = 2.33

Hydrophytic Vegetation Indicators:

☑ Dominance test is >50%

☑ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	**10 YR 3/2**	**93**	**7.5 YR 4/4**	**7**	**C**	**M**	**silt loam**	

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydrophytic Soil Present? ☑ Yes ☐ No

Remarks: Discharge of dredge material from ponds into this area as well as historic fill and excavation activities have significantly altered soil properties.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☐ Yes	☑ No	Depth (inches): _____
Water Table Present?	☐ Yes	☑ No	Depth (inches): _____
Saturation Present? (includes capillary fringe)	☐ Yes	☑ No	Depth (inches): _____

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample plot is located in small depression that has resulted from fill placement in adjacent areas, resulting in artifical creation of this small depression. Septic drainfield overlaps depressional area likely providing just minor seepage into this area throughout the year. Geomorphic position (depression) is artificially-induced; only other positive (secondary) indicator is FAC-neutral test.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/11/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-5

Investigator(s): David Conlin, Rory Lee Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): floodplain Local Relief (concave, convex, none:) concave Slope (%): 0

Subregion (LLR): A Lat: 47º 04' 59" N Long: 122º 10' 36" W Datum: NAD 83

Soil Map Unit Name: Aquic xerofluvents NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☑ Soil ☑ Hydrology significantly disturbed? Are "normal circumstances" present? ☐ Yes ☑ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? ☑ Yes ☐ No Hydric Soil Present? ☑ Yes ☐ No Weltand Hydrology Present? ☑ Yes ☐ No	Is the sampled area within a Wetland? ☐ Yes ☑ No	

Remarks: Not considered a wetland because soil and, in particular, hydrology characteristics are a result of artifically-created conditions, including discharge of stormwater from impervious surfaces into a human-created depression that is underlain by a confining layer of fill. Depression is furthermore well below the regulatory size threshold in Pierce County and is considered a stormwater ditch, rather than a wetland.

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum			
1. *Salix lasiandra*	80	Y	FACW+
2.			
3.			
4.			
5.			
	80	= Total Cover	
Herb Stratum			
1. *Juncus effusus*	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:
OBL Species		x 1 =	0
FACW Species	90	x 2 =	180
FAC Species		x 3 =	0
FACU Species		x 4 =	0
UPL Species		x 5 =	0
Column Totals:	90 (A)		180 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

☑ Dominance test is >50%

☑ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	**10 YR 4/2**	**98**	**7.5 YR 4/6**	**2**	**C**	**M**	**sandy loam**	shovel refusal at 8"

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobbles and gravels from road construction

Depth (inches): 8

Hydric Soil Present? ☑ Yes ☐ No

Remarks: Road construction has resulted in the artificial creation of a confining (restrictive) layer at 8 inches below the surface. Redoximorphic concentrations are marginally common enough to qualify as hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☐ Yes	☑ No	Depth (inches):
Water Table Present?	☐ Yes	☑ No	Depth (inches):
Saturation Present? (includes capillary fringe)	☐ Yes	☑ No	Depth (inches):

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample plot is located in small depression that has resulted from road building and associated drainage swale. Geomorphic position (depression) is artificially-induced. Hydrology is supplemented by run-off from adjacent impervious surfaces.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/11/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-6

Investigator(s): David Conlin, Rory Lee Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): terrace Local Relief (concave, convex, none:) flat Slope (%): 0

Subregion (LLR): A Lat: 47º 04' 57" N Long: 122º 10' 43" W Datum: NAD 83

Soil Map Unit Name: Aquic xerofluvents NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "normal circumstances" present? ☑ Yes ☐ No

Are ☐ Vegetation ☑ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☑ Yes ☐ No	Is the sampled area within a Wetland? ☑ Yes ☐ No
Hydric Soil Present?	☑ Yes ☐ No	
Weltand Hydrology Present?	☑ Yes ☐ No	

Remarks: Positive indicators of hydrophytic vegetation and wetland hydrology present. Soils qualify as hydric under procedures for problem soils.

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	20	Y	FAC
2.			
3.			
4.			
	20	= Total Cover	
Sapling/Shrub Stratum			
1. Alnus rubra	60	Y	FAC
2. Cornus sericea	10	N	FACW
3. Salix lasiandra	5	N	FACW
4. Salix scouleriana	30	Y	FAC
5.			
	105	= Total Cover	
Herb Stratum			
1. Dicentra formosa	30	Y	FACU
2. Rubus armeniacus	15	Y	FACU
3. Polystichum munitum	5	N	FACU
4. Polygonum cuspidatum	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	55	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: **5** (B)

Percent of dominant Species That are OBL, FACW, or FAC: **60** (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:
OBL Species		x 1 =	0
FACW Species	15	x 2 =	30
FAC Species	110	x 3 =	330
FACU Species	55	x 4 =	220
UPL Species		x 5 =	0
Column Totals:	180 (A)		580 (B)

Prevalence Index = B/A = 3.22

Hydrophytic Vegetation Indicators:

☑ Dominance test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks: Riparian vegetation passes dominance test, but not prevalence index.

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	**10 YR 4/4**	**100**					**sand**	

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric Soil Present? ☑ Yes ☐ No

Remarks: Problem soil - indicators have not developed due to recent alluvial deposition (sand) adjacent to Voight Creek. Wetland is located on a level area on a low terrace at the fringe of Voight Creek. It therefore qualifies as hydric under the definition of "vegetated sand and gravel bars within floodplains."

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☑ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☐ Yes	☑ No	Depth (inches): _____
Water Table Present?	☐ Yes	☑ No	Depth (inches): _____
Saturation Present? (includes capillary fringe)	☐ Yes	☑ No	Depth (inches): _____

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/11/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-7

Investigator(s): David Conlin, Rory Lee Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): Floodplain Local Relief (concave, convex, none:) slightly sloped Slope (%): 5

Subregion (LLR): A Lat: 47º 05' 01" N Long: 122º 10' 46" W Datum: NAD 83

Soil Map Unit Name: Puyallup fine sandy loam NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "normal circumstances" present? ☑ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☑ Yes	☐ No	Is the sampled area within a Wetland? ☐ Yes ☑ No
Hydric Soil Present?	☐ Yes	☑ No	
Weltand Hydrology Present?	☐ Yes	☑ No	

Remarks: Vegetation is only positive indicator; soils clearly not hydric; no evidence of regular saturation or indundation.

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	40	Y	FAC
2.			
3.			
4.			
	40	= Total Cover	
Sapling/Shurb Stratum			
1. Rubus armeniacus	5	N	FACU
2. Sambucus racemosa	5	N	FACU
3. Cornus sericea	50	Y	FACW
4. Symphoricarpos albus	10	N	FACU
5.			
	70	= Total Cover	
Herb Stratum			
1. Equisetum arvense	10	Y	FAC
2. Dicentra formosa	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species		x 1 =	0
FACW Species	50	x 2 =	100
FAC Species	50	x 3 =	150
FACU Species	25	x 4 =	100
UPL Species		x 5 =	0
Column Totals:	125 (A)		350 (B)

Prevalence Index = B/A = 2.80

Hydrophytic Vegetation Indicators:

☑ Dominance test is >50%

☑ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	**2.5 Y 4/2**	**100**						sandy loam

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydrophytic Soil Present? ☐ Yes ☑ No

Remarks: Looked very carefully for faint or occasional redoximorphic concentrations - none found.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☐ Yes	☐ No	Depth (inches): _____
Water Table Present?	☐ Yes	☐ No	Depth (inches): _____
Saturation Present? (includes capillary fringe)	☐ Yes	☐ No	Depth (inches): _____

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Does NOT pass FAC-neutral test. Highly permeable soils do not restrict infiltration.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Voights Creek Fish Hatchery City/County: Pierce County Sampling Date: 9/11/2008

Applicant/Owner: WDFW State: Washington Sampling Point: SP-8

Investigator(s): David Conlin, Rory Lee Section/Township/Range: Sec 33, T 19 N, R 05 E

Landform (hillslope, terrace, etc.): Floodplain Local Relief (concave, convex, none:) slightly concave Slope (%): 5

Subregion (LLR): A Lat: 47º 05' 00" N Long: 122º 10' 45" W Datum: NAD 83

Soil Map Unit Name: Puyallup fine sandy loam NWI Classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "normal circumstances" present? ☑ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☐ Yes ☑ No	Is the sampled area within a Wetland? ☐ Yes ☑ No
Hydric Soil Present?	☐ Yes ☑ No	
Weltand Hydrology Present?	☐ Yes ☑ No	

Remarks:

VEGETATION - Use scientific Names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	50	Y	FAC
2.			
3.			
4.			
	50	= Total Cover	
Sapling/Shurb Stratum			
1. Rubus armeniacus	75	Y	FACU
2. Salix scouleriana	5	N	FAC
3.			
4.			
5.			
	80	= Total Cover	
Herb Stratum			
1. Urtica dioica	35	Y	FAC
2. Dicentra formosa	15	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species		x 1 =	0
FACW Species		x 2 =	0
FAC Species	90	x 3 =	270
FACU Species	90	x 4 =	360
UPL Species		x 5 =	0
Column Totals:	180 (A)		630 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

☐ Dominance test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☐ Yes ☑ No

Remarks:

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	**2.5 Y 4/4**	**100**						sandy loam

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydrophytic Soil Present? ☐ Yes ☑ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduction Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ☐ Yes ☐ No Depth (inches): _____

Water Table Present? ☐ Yes ☐ No Depth (inches): _____

Saturation Present? ☐ Yes ☐ No Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX E
WETLAND RATING FORMS

Wetland name or number Wetland A .

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Wetland A Date of site visit: 9/11/08

Rated by: D. Conlin, R. Lee Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 33 TWNSHP: 19 N RNGE: 05 E Is S/T/R in Appendix D? Yes No X

Map of wetland unit: Figure 4 Estimated size 4,700 sq. ft.

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: I____ II____ III X IV____

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	10
Score for Hydrologic Functions	10
Score for Habitat Functions	11
TOTAL Score for Functions	31

Category based on SPECIAL CHARACTERISTCS of Wetland I____ II____ Does not apply X

Final Category (choose the "highest" category from above") III

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	
Natural Heritage Wetland	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	

Wetland HGM Class used for Rating	
Depressional	
Riverine	X
Lake-fringe	
Slope	
Flats	
Freshwater Tidal	
Check if unit has multiple HGM classes present	

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number Wetland A .

Classification of Vegetated Wetlands for Western Washington

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 (i.e. except during floods)?
   NO – go to 2 **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   YES – Freshwater Tidal Fringe **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is 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 meet both of the following criteria?
   _____ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   _____ At least 30% of the open water area is deeper than 6.6 (2 m)?
   NO – go to 4 **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland 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**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   NO – go to 5 **YES** – The wetland class is **Slope**

5. Does the entire wetland 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 two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   NO – go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 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 your wetland. 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 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	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

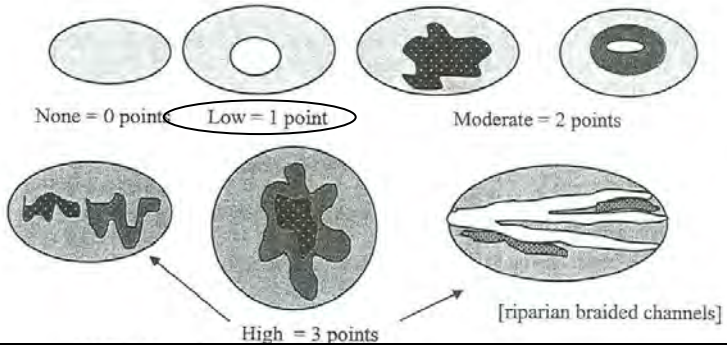
If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number Wetland A .

R	Riverine and Freshwater Tidal Fringe Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure n/a.** **2**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure 4 .** **3**
	Add the points in the boxes above	**5**
R 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland _X_ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other _____ YES multiplier is 2 NO multiplier is 1	*(see p. 53)* Multiplier **2**
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	**10**
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure 4 .** **1**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure 4 .** **4**
	Add the points in the boxes above	**5**
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ____ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ____ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* YES multiplier is 2 NO multiplier is 1	*(see p.57)* Multiplier **2**
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	**10**

Comments:

Wetland name or number Wetland A .

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	Points (only 1 score per box)
H 1 Does the wetland have the potential to provide habitat for many species?	
H 1.1 Vegetation structure *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____ Aquatic Bed ____ Emergent plants _X_ Scrub/shrub (areas where shrubs have > 30% cover) ____ Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* ____ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more..... points = 4 — 3 structures..... points = 2 2 structures..... points = 1 — 1 structure ..... points = 0	**Figure 4 .** **0**
H 1.2 Hydroperiods *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated — 4 or more types present points = 3 _X_ Seasonally flooded or inundated — 3 or more types present.....points = 2 ____ Occasionally flooded or inundated — 2 types present.....points = 1 ____ Saturated only — 1 type present .....points = 0 _X_ 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** **Map of hydroperiods**	**Figure 4 .** **1**
H 1.3 Richness of Plant Species *(see p. 75)*: 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)* *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 List species below if you want to: _____ _____ _____ _____	**1**
H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure 4 .** **1**
H 1.5 Special Habitat Features *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ____ Standing snags (diameter at the bottom > 4 inches) in the wetland ____ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ____ 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 turned grey/brown)* ____ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* _X_ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	**1**
H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**4**

Wetland name or number Wetland A .

H 2	**Does the wetland have the opportunity to provide habitat for many species?**	(only 1 score per box)
	H 2.1 Buffers *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use).....**points = 5** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference.....**points = 4** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference.....**points = 4** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference.....**points = 3** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference .....**points = 3** **If buffer does not meet any of the criteria above:** ____ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK .....**points = 2** ____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK.....**points = 2** ____ Heavy grazing in buffer .....**points = 1** ____ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland).....**points = 0** _X_ Buffer does not meet any of the criteria above .....**points = 1** **Arial photo showing buffers**	**Figure 2 .** **1**
	H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* YES = **4 points** (go to H 2.3) NO = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (go to H 2.3) NO = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR YES = 1 point • Within 1 mile of a lake greater than 20 acres? NO = 0 points	**2**

Comments:

Wetland name or number Wetland A .

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): Which of the following priority habitats are within 330 ft. (100m) of the wetland? *NOTE: the connections do not have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions.* _X_ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____ **Aspen Stands**: Pure or mixed stands of aspen greater than 0.8 ha (2 acres) ____ **Cliffs**: Greater than 7.6m (25 ft) high and occurring below 5000 ft. ____ **Old-growth 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 20 trees/ha (8 trees/acre) > 81cm (32 in) dbh or > 200 years of age. ____ **Mature forests**: Stands with average diameters exceeding 53cm (21 in) 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. ____ **Prairies**: Relatively undisturbed areas (as indicated by dominance of native plants) where greases and/or forbs form the natural climax plant community. ____ **Talus**: Homogenous areas of rock rubble ranging in average size 0.15 – 2.0m (0.5 – 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages. ____ **Oregon white Oak**: Woodlands stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%. ____ **Urban Natural Open Space**: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development. ____ **Estuary/Estuary-like**: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5 ppt. during the period of average annual low flow. Includes both estuaries and lagoons. ____ **Marine/Estuarine Shorelines**: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control). If wetland has 3 or more priority habitats..= 4 points If wetland has 1 priority habit .. = 1 point If wetland has 2 priority habitats.....= 3 points No habitats..... = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. (Nearby wetlands are addressed in question H 2.4).	**1**
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. .....points = 3 • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile.....points = 3 • There is at least 1 wetland within 1/2 mile .....points = 2 • There are no wetlands within 1/2 mile.....points = 0	**3**
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	**7**
	TOTAL for H 1 from page 8	**4**
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	**11**

Comments:

Wetland name or number Wetland A .

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit 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 X	
	SC 1.1 Is the wetland unit 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. 1**
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? YES = Category I NO = Category II ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ____ At least 3/4 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual Rating I/II**
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* S/T/R information from Appendix D X or accessed from WNHP/DNR web site _____ YES _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 NO X SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? YES = Category 1 NO _____ not a Heritage Wetland	**Cat I**
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? YES = go to question 3 NO = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? YES = go to question 3 NO = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? YES = Is a bog for purpose of rating NO = go to question 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover*)? YES = Category I NO = Is not a bog for purpose of rating	**Cat. I**

Wetland name or number __Wetland A__.

SC4	**<u>Forested Wetlands</u>** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the 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 function.* ____ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ____ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); 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. YES = Category I NO = __X__ not a forested wetland with special characteristics	**Cat. I**
SC5	**<u>Wetlands in Coastal Lagoons</u>** *(see p. 91)* 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 surface 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 __X__ 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 invasive plant species (see list of invasive species on p. 74). ____ At least 3/4 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 acre (4350 square ft.) YES = Category I NO = Category II	**Cat. I** **Cat. II**
SC6	**<u>Interdunal Wetlands</u>** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES = Go to SC 6.1 NO __X__ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its 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 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? YES = Category II NO = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p. 1	**N/A**

Comments: