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KIRKLAND, WASHINGTON

1.0 INTRODUCTION

Shannon & Wilson, Inc. conducted a wetland and stream delineation on portions of Juanita Beach Park located at 9703 NE Juanita Drive and reviewed an existing delineation along a segment of Juanita Bay Park, Kirkland, Washington (Figure 1). Juanita Beach Park (King County tax parcels 179150-0425 and 302605-9147) is located in the SW ¼ of Section 30 and the NE ¼ of Section 31, Township 26N, Range 5E and Juanita Bay Park is located in the eastern half of Section 31. The parks are owned and operated by the City of Kirkland (hereafter referred to as "the City") and provide a variety of passive and active recreation opportunities to park users.

The City has been implementing the Juanita Beach Park Master Plan (J.A. Brennan, 2006) in phases (Exhibit 1). In 2006, the City issued a Determination of Non-Significance based on a programmatic State Environmental Policy Act (SEPA) checklist for the Master Plan. At the time, the presence of wetlands in the park, other than those associated with Juanita Creek, was not confirmed so the programmatic SEPA did not identify any project-related wetland impacts.

Exhibit 1. Excerpt from Juanita Beach Park Master Plan (J.A. Brennan Associates PLLC, 2006).

During development of the Phase I plans, an additional wetland was confirmed on the Lake Washington shoreline. The Phase I SEPA analysis documented the stream and wetland impacts and associated mitigation, and the City issued a Determination of Non-Significance in 2009. The remaining project permits were obtained for Phase I in 2009 and 2010, and construction was completed in 2011. The final permitted condition is shown in Exhibit 2.

Exhibit 2. Phase I Improvements at Juanita Beach Park (J.A. Brennan Associates PLLC, 2010).

As part of Phase II, the City is planning several improvements to Juanita Beach Park, including a new bathhouse with concessions and utility/storage spaces, relocated playground, and pavilion (picnic shelter). Since implementation of Phase I, the existing conditions and critical areas regulations have changed, resulting in discovery of a new wetland in the current Phase II project area and increased buffer encroachment into the Phase II project area. Accordingly, the proposed Phase II Juanita Beach Park improvements will impact wetlands and wetland and stream buffers. This area, and the on-site buffer mitigation area, will hereafter be referred to as "the project area" or "project site."

A review of an existing wetland delineation was conducted at the north end of Juanita Bay Park to support development of a wetland mitigation plan. No additional flags were hung and no additional data pits were dug. The existing wetland rating form for the site wetland was also reviewed (The Watershed Company, 2016). Portions of Juanita Bay Park used to mitigate for Juanita Beach Park wetland impacts will be referred to as "the wetland mitigation area."

This report characterizes and identifies the limits of streams, wetlands, and their associated buffers on the portion of Juanita Beach Park being considered for Phase II facility improvements; describes the governing local, state, and federal regulations; discusses wetland, wetland buffer, and stream buffer project area impacts; and describes the project's mitigation strategy.

2.0 DOCUMENT REVIEW

2.1 Juanita Beach Park

Background information pertaining to the site was collected and reviewed prior to the wetland and stream delineation fieldwork. These information sources included:

- Douglass Consulting (Douglass) Wetland and Ordinary High Water Mark Determination Report, Juanita Beach Park dated December 2008 (Douglass, 2008)
- Douglass Addendum to the Juanita Beach Park Wetland and Stream Mitigation Plan (Douglass, 2009)
- Nationwide Permit Verification Letter for Phase I, NWS-2008-01222 (U.S. Army Corps of Engineers [Corps], 2010)
- King County iMap Interactive Mapping Tool (King County, 2016)
- U.S. Department of Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS, 2016)
- King County Soil Survey accessed via the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS, 2016)

A 2008 wetland and stream delineation performed at Juanita Beach Park by Douglass identified four riverine wetlands associated with Juanita Creek (Douglass Wetlands A, B, C, and D), one depressional wetland (Douglass Wetland E), one lake fringe wetland (Douglass Wetland F), and the ordinary high water mark (OHWM) of Juanita Creek (Douglass, 2008). In 2011, Phase I of the Juanita Beach Park Master Plan was implemented, which included restoration work in the portion of Juanita Creek that flows through the park and its associated riverine wetlands. The restoration work involved increasing sinuosity within Juanita Creek and creating a single marsh wetland in place of Douglass Wetlands A, B, C, and D, now referred to as Wetland A or Oxbow Marsh, to provide fish and wildlife habitat and improve water quality function (Douglass, 2009). Other components of Phase I included modification of wetlands and buffers in the central and eastern portions of the park. Because the Douglass delineation was completed nearly ten years prior, it was necessary to redelineate the wetlands on the Juanita Beach Park site.

No wetlands are identified at Juanita Beach Park by the USFWS NWI and the King County iMap online mappers.

The NRCS web soil survey identifies site soils as Indianola loamy sand, 0 to 5 percent slopes, which is not considered a hydric soil.

The King County iMap and Washington State Department of Natural Resources (WDNR) stream typing web applications show Juanita Creek flowing north to south across the site and both identify the stream as salmon-bearing.

2.2 Juanita Bay Park

The proposed wetland mitigation area is part of a large wetland complex in Juanita Bay Park. The area of interest was delineated by The Watershed Company (2016); the complete report is included as Appendix A.

3.0 METHODS

3.1 Juanita Beach Park Wetland and Stream Delineation

Shannon & Wilson conducted the wetland and stream delineation fieldwork in Juanita Beach Park on January 18 and 19, 2016. Wetlands were identified using methods described in the Corps' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Corps Engineer Research and Development Center, 2010). The OHWM of Juanita Creek was delineated using the Washington State Department of Ecology's (Ecology's) 2016 *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State.*"

Wetland areas were determined using the triple-parameter approach, which considers vegetation types, soil conditions, and hydrologic conditions. For an area to be considered wetland, it must display each of the following: (a) dominant plant species that are considered hydrophytic by the accepted classification indicators, (b) soils that are considered hydric under federal definition, and (c) indications of wetland hydrology, in accordance with federal definition. Appendix B includes a complete description of the methodology.

Nine data plots (four wetland and five upland) were characterized within wetland and upland community types in Juanita Beach Park to help describe the general conditions at the site. Information gathered at these locations is provided in Appendix C. Wetland boundaries were flagged with pink "wetland boundary" ribbon flagging and pink pin flags, the OHWM of Juanita Creek was flagged with orange ribbon flagging, and wetland data plots were identified by orange

pin flags. Wetland boundary, stream OHWM, and data pit flag locations were located using a hand-held Trimble Geo 7 series Global Positioning System (GPS) receiver.

KZC 83.80.79 specifies that the Lake Washington OHWM "corresponds with a lake elevation of 18.5 feet, based on the NAVD 88 datum." Electronic topography information provided by the City was used to map shoreline jurisdiction (generally 200 feet upland of the OHWM) and the upland edge of the required shoreline setbacks. The topography was surveyed in 2009 prior to the Phase I implementation, and then was modified based on the project's as-built drawings.

3.2 Juanita Bay Park Wetland Delineation

The Watershed Company's wetland delineation in Juanita Bay Park was completed in April 2016 (Watershed, 2016). Shannon & Wilson visited the site in January 2017 to look for the wetland boundary flags and observe site conditions. Wetland boundary flags that were observed in the project wetland mitigation area were located using a hand-held Trimble Geo 7 series GPS receiver.

4.0 SITE DESCRIPTION

4.1 Juanita Beach Park

Juanita Beach Park sits on the northeast shore of Lake Washington and is surrounded by the City, commercial developments, and residential development. The park is generally divided into two sections by NE Juanita Drive, with ball fields, tennis courts, and mowed lawn in the north area. The southern portion of the park contains a bathhouse, playground, amphitheater, and shoreline promenade, as well as natural features such as Juanita Creek, Lake Washington, and wetlands.

The project site is located in the southern portion of the park, south of a paved parking lot and west of a recently constructed stormwater treatment swale network. The western boundary of the project site contains Juanita Creek and the Oxbow Marsh created as part of Phase I of the Master Plan. The creek flows from north to south through the park and into Lake Washington. Developed structures within the project site include a concrete block bathhouse and a playground. The project site slopes gently toward Lake Washington with topographical variations that direct surface water to Juanita Creek and the stormwater swale system, as well as the shores of Lake Washington (Appendix D, Photo 1). A concrete promenade meanders along the Lake Washington shoreline, connecting at either end to an over-water pedestrian boardwalk that encircles the swimming area and beach. During the fieldwork, all areas of the park were observed to be regularly used by visitors.

4.2 Juanita Bay Park

Juanita Bay Park is a 110-acre, City-owned park on the shore of Juanita Bay on Lake Washington. Approximately 98 acres of the park consist of wetlands, Forbes Creek, and functional buffer areas. These areas contain paved trails, boardwalks, and interpretive signs. The park's habitat areas support nearly 200 species of birds according to Eastside Audubon, which leads monthly bird-watching tours. Eastside Audubon also manages the Eastside Ranger Program, which leads monthly interpretive tours.

Juanita Bay Park has been the recipient of numerous planning and restoration efforts, starting with the preparation of the *Juanita Bay Park Vegetation Management Plan* in 2004 (Sheldon & Associates, Inc., 2004), formation of the Green Kirkland Partnership (Partnership) in 2005, and continuing with the development and implementation of a *20-Year Forest Restoration Plan* in 2008 (Partnership, updated in 2015). Most of these efforts target the control and removal of invasive species, and establishment of healthy native communities. The City's *Shoreline Restoration Plan* (The Watershed Company, 2010) recommends that invasive species control and native species plantings take place in Juanita Bay Park.

5.0 RESULTS

5.1 Juanita Beach Park

Four wetlands, Wetlands A through D, and Juanita Creek, were identified on the project site (Figure 3). Descriptions of Wetlands A through D follow and include observations made during the delineation fieldwork site visits. Vegetation is described below by common name, with the scientific name and indicator status in parentheses after the first use. Soils are described with the associated Munsell® Color Charts color in parentheses. Four wetland data plots were characterized at representative locations onsite to document general surface and subsurface conditions (Appendix C).

5.1.1 Wetland A (Oxbow Marsh)

Wetland A (approximately 1.2 acres) was delineated along the left (east) bank of Juanita Creek (Figure 3) and is the eastern border of Oxbow Marsh, the wetland created in 2011 as part of the Juanita Creek restoration work included in Phase I of the Juanita Beach Park Master Plan. Wetland A is a palustrine forested, scrub-shrub, emergent wetland according to the Cowardin classification, and is a riverine wetland according to hydrogeomorphic classification. The portion of Wetland A that was delineated on the project site is located on a shallow bench below the OHWM of Juanita Creek (Appendix D, Photo 2).

Based on guidance provided in the *Washington State Wetland Rating System for Western Washington* (Hruby, 2014), the wetland fringe on the east side of the stream channel (left bank) was rated as part of the Oxbow Marsh wetland unit. According to the rating manual, a stream less than 50 feet wide with wetland on both banks is considered part of the wetland unit and the two banks should not be rated separately.

Vegetation in Wetland A is dominated by a shrub layer of red-osier dogwood (*Cornus sericea*, FACW) and willow (*Salix* sp., assumed FAC), and an herbaceous layer of reed canarygrass (*Phalaris arundinacea*, FACW), soft rush (*Juncus effusus,* FACW), and small-fruited bulrush (*Scirpus microcarpus*, OBL) (see Appendix C, Data Sheet DP-1).

Soil in Wetland A is generally characterized by a surface horizon of very dark brown (10YR 2/2) sandy clay loam extending to 4 inches below ground surface (bgs), underlain by a dark gray (10YR 4/1), sandy loam with strong brown (7.5YR 4/6) redoximorphic concentrations in the matrix and pore linings extending to 9 inches bgs. Below 9 inches is a layer of loamy sand of the same dark gray matrix and strong brown redoximorphic concentrations extending to at least 20 inches bgs (Appendix D, Photo 3). Soil observed in Wetland A meets the *depleted matrix* (F3) hydric soil indicator.

Wetland A hydrology is likely supported predominantly by water levels in Juanita Creek as well as shallow subsurface flow. Observed hydric indicators in Wetland A include saturation to 6 inches bgs, water observed in the data pit at 10 inches bgs, drift deposits, and oxidized rhizospheres along living roots.

Wetland A was categorized according to Ecology's *Washington State Wetland Rating System for Western Washington* (Hruby, 2014) per City of Kirkland Zoning Code (KZC) Chapter 83.500 (Kirkland, 2016). Based on that rating system, Wetland A is a Category II riverine wetland with moderate water quality function (7 points), moderate hydrologic function (6 points), and moderate habitat function (7 points) (Appendix E).

5.1.2 Wetland B

Wetland B (approximately 0.47 acre) was identified on the shores of Lake Washington in a similar location as the lacustrine wetland described in 2008 by Douglass (2008). The northeast corner of Wetland B closest to the project site was delineated (Appendix D, Photo 4). Wetland B is a palustrine scrub-shrub, emergent wetland according to the Cowardin classification, and is a lacustrine wetland according to hydrogeomorphic classification. Wetland B is dissected by a system of foot paths that was observed to be heavily used by dog walkers on the day of fieldwork.

Vegetation in Wetland B is dominated by a shrub layer of Pacific willow (*Salix lucida lasiandra*, FACW) and black cottonwood (*Populus balsamifera*, FAC), and an herbaceous layer of reed canarygrass, yellow flat iris (*Iris pseudacorus,* OBL), and soft rush (see Appendix C, Data Sheet DP-3).

Soil in Wetland B is generally characterized by a surface horizon of very dark grayish brown (10YR 3/2), sandy loam extending to 1 inch bgs, underlain by a dark grayish brown (10YR 4/2), loamy sand extending to 2 inches bgs, underlain by a dark gray (N 4/) sand with strong brown (7.5YR 4/6) redoximorphic concentrations in the matrix extending to at least 18 inches bgs. Soil observed in Wetland B meets the *sandy gleyed matrix* (S4) hydric soil indicator.

Wetland B hydrology is likely supported predominantly by water levels in Lake Washington. Observed hydric indicators in Wetland B were saturation to 5 inches bgs, and water observed in the data pit at 6 inches bgs.

Wetland B was categorized according to Ecology's *Washington State Wetland Rating System for Western Washington* (Hruby, 2014) per KZC Chapter 83.500 (Kirkland, 2016). Based on that rating system, Wetland B is a Category II lacustrine wetland with high water quality function (9 points), moderate hydrologic function (6 points), and moderate habitat function (6 points) (Appendix E).

5.1.3 Wetland C

Wetland C (approximately 3,870 square feet) was identified in the grassy area south of the park's existing bathhouse (Appendix D, Photo 5). This wetland is a portion of the much larger Douglass Wetland E that was originally delineated in 2008. As part of Phase I, this portion of Douglass Wetland E was "paper filled" under the City's wetland regulations in effect at that time, and the paper filled wetland and its buffer were mitigated accordingly. However, this portion of Douglass Wetland E was not physically altered and remained as mowed lawn that continued in active public use. East of the paper filled area, a portion of Douglass Wetland E was permanently altered to create the stormwater system and also mitigated consistent with local, state and federal permits. As part of this Phase II site investigation, the paper filled remnant of Douglass Wetland E was re-delineated and labeled Wetland C.

Wetland C extends to the east of the project site and converges with the stormwater swale treatment system that was built within a portion of the existing wetland. The bioswale was constructed to carry and treat stormwater runoff from the parking lot into a natural wetland on the south side of the promenade (part of the Douglass Wetland E). As shown in the wetland

rating form included in our report, the bioswale and Douglass Wetland E are included in the Wetland C rating unit. However, the bioswale between Wetland C and Douglass Wetland E is not jurisdictional wetland that requires a wetland buffer under the current code. The square footage of the original area of Douglass Wetland E in the present location of the bioswale was identified in the June 2009 plans and report as being part of the mitigated impact area square footage that was approved by the Corps, Ecology, and the City. Further, the June 2009 exhibits clearly delineate the new boundary of Douglass Wetland E, which does not extend landward of the waterward edge of the boardwalk crossing of the bioswale, and show the boundaries of the modified Douglass Wetland E buffer (see Exhibit 3). Wetland C is a palustrine emergent wetland according to the Cowardin classification and is a depressional wetland according to hydrogeomorphic classification.

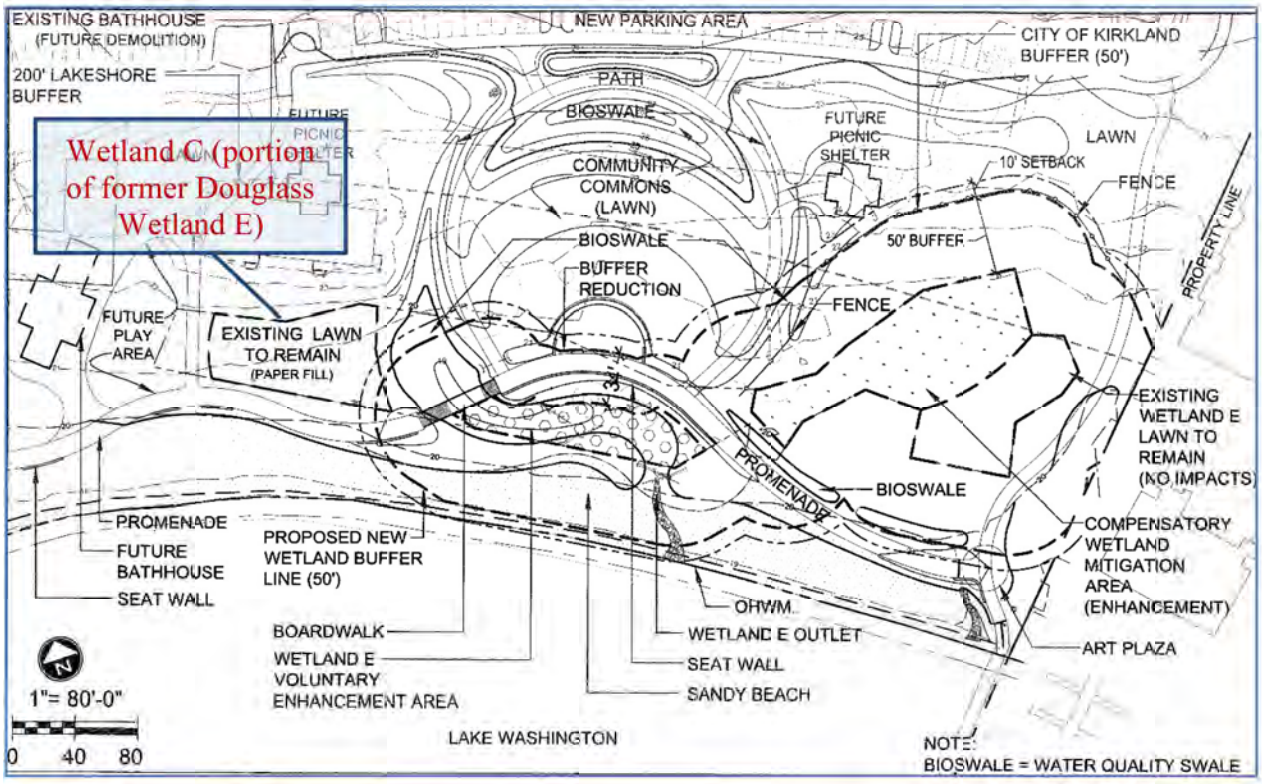

Exhibit 3. Modification of Douglass Wetland E permitted as part of Phase I. (Excerpt from figures submitted to local, state and federal agencies as part of Phase I permitting, J.A. Brennan Associates PLLC, 2009.)

Vegetation in Wetland C is dominated by an herbaceous layer of bluegrass (*Poa* sp., assumed FAC) and also contains toad rush (*Juncus bufonius*, FACW) (see Appendix C, Data Sheet DP-5). The vegetation in the wetland was mowed very short, and no bluegrass seed heads

were observed. We suspect that the bluegrass species present in the wetland is likely *Poa annua* or *Poa pratensis*, both of which are designated as a FAC hydric indicator status.

Soil in Wetland C is generally characterized by a surface horizon of black (10YR 2/1), loamy sand extending to 1 inch bgs, underlain by a dark grayish brown (10YR 4/2) sand with dark yellowish brown (10YR 3/4) redoximorphic concentrations in the matrix extending to 6 inches bgs, underlain by a black (10YR 2/1), loamy sand extending to 7 inches bgs, underlain by a dark gray (N 4/) sand with strong brown (7.5YR 4/6) redoximorphic concentrations in the matrix extending to 14 inches bgs, underlain by a dark gray (N 4/) sand extending to at least 20 inches bgs (Appendix D, Photo 6). Soil observed in Wetland C meets the *sandy redox* (S5) hydric soil indicator.

Wetland C hydrology is likely supported predominantly by seasonally high groundwater influenced water levels in Lake Washington and surface runoff. Observed hydric indicators in Wetland C were saturation from 0 to 6 inches bgs and again at 10 inches bgs, and water observed in the data pit at 11 inches bgs.

Wetland C was categorized according to Ecology's *Washington State Wetland Rating System for Western Washington* (Hruby, 2014) per KZC Chapter 83.500 (Kirkland, 2016). Based on that rating system, Wetland C is a Category III depressional wetland with moderate water quality function (6 points), moderate hydrologic function (5 points), and moderate habitat function (5 points) (Appendix E).

5.1.4 Wetland D

Wetland D (approximately 4,310 square feet) was identified in the lawn south of the Park's existing playground (Appendix D, Photo 7). This wetland was not previously identified during development of the Juanita Beach Park Master Plan or development of Phase I project designs. Wetland D is a palustrine forested, emergent wetland according to the Cowardin classification and is a depressional wetland according to hydrogeomorphic classification.

Vegetation in Wetland D is dominated by a forested layer of weeping willow (*Salix babylonica*, FACW) (one tree) and an herbaceous layer of bluegrass and toad rush (see Appendix C, Data Sheet DP-7). The vegetation in the wetland was mowed very short and no bluegrass seed heads were observed. We suspect that the bluegrass species present in the wetland is likely *Poa annua* or *Poa pratensis*, both of which are designated as a FAC hydric indicator status.

Soil in Wetland D is generally characterized by a surface horizon of very dark brown (10YR 2/2), loamy sand extending to 2 inch bgs, underlain by a very dark gray (10YR 3/1) sand extending to 4 inches bgs, underlain by a dark gray (10YR 4/1) sand with dark brown (7.5YR 3/4) redoximorphic concentrations in the matrix extending to at least 18 inches bgs (Appendix D, Photo 8). Soil observed in Wetland D meets the *sandy redox* (S5) hydric soil indicator.

Wetland D hydrology is likely supported predominantly by seasonally high groundwater levels influenced by water levels in Lake Washington and surface runoff. Observed hydric indicators in Wetland D were saturation from 0 to 4 inches and saturation at 10 inches bgs, and water observed in the data pit at 11 inches bgs. Surface water was observed within the wetland, adjacent to the data pit (Appendix D, Photo 9).

Wetland D was categorized according to Ecology's *Washington State Wetland Rating System for Western Washington* (Hruby, 2014) per KZC Chapter 83.500 (Kirkland, 2016). Based on that rating system, Wetland D is a Category IV depressional wetland with low water quality function (4 points), moderate hydrologic function (5 points), and moderate habitat function (5 points) (Appendix E).

5.1.5 Juanita Creek

Juanita Creek flows through the site from the north to the south before joining with Lake Washington. It is a Class A stream as identified in the KZC and a Type F stream as classified by the WDNR (Kirkland, 2016 and WDNR, 2016). Type F streams are known to be used by fish or meet the criteria for potential use (WDNR, 2016). No permanent or total fish barriers are present within the site and none were identified within the project area on Washington State Department of Fish and Wildlife (WDFW) SalmonScape (WDFW, 2016). This stretch of Juanita Creek has documented Chinook, winter steelhead, and sockeye presence, as well as coho spawning habitat (WDFW, 2016).

The OHWM of Juanita Creek was delineated on the left (east) bank using the presence of rack lines, sediment deposits, undercut banks, and water staining. At the time of the site visit, the wetted width within the site averaged 20 feet with a water depth of approximately 2 feet in the thalweg (Appendix D, Photo 2). The channel substrate is dominated by sand and gravels. In-stream habitat consists of glides, scour pools, and off-channel marsh habitat associated with Oxbow Marsh. Juanita Creek is on Ecology's 303(d) list for temperature, bacteria, and dissolved oxygen.

5.1.6 Uplands

Uplands onsite consist of the landscaped lawn areas surrounding the existing developed structures (bathhouse, playground, parking lot, and volleyball courts). Vegetation observed in site uplands consisted of ornamental trees growing adjacent to the walking path and parking lot, and planted conifer saplings such as Douglas-fir (*Pseudotsuga menziesii*, FACU) and western redcedar (*Thuja plicata*, FAC) bordering Juanita Creek. The lawn area consisted of bluegrass, white clover (*Trifolium repens*, FAC), dandelion (*Taraxacum officinale*, FACU), and lawn daisy (*Bellis perennis,* NI).

Upland soils are predominantly composed of fill and are very compacted. The soils are generally characterized by a surface layer of black (10YR 2/1), loamy sand 2 to 4 inches thick underlain by dark grayish brown (10YR 4/2) to very dark grayish brown (10YR 3/2), gravelly, loamy sand extending to at least 14 inches bgs. The hard pan, compacted gravel layer began at 2 and 11 inches bgs at different points on the site. Closer to the wetland boundary, upland soils contained brown (10YR 4/3) to dark yellowish brown (10YR 4/4) redoximorphic features in the second horizon.

The compacted gravel limited data pit depth to approximately 12 to 14 inches, and no hydrology was observed in all but one of the upland areas. In the lawn area north of Wetland D and east of the playground, saturation was observed at 17 inches bgs and water was observed in the data pit at 18 inches bgs.

5.2 Juanita Bay Park

As mentioned above, The Watershed Company (2016, see Figure 4 and Appendix A) delineated the eastern edge of the proposed wetland mitigation area in Juanita Bay Park as part of an evaluation of a City sidewalk project. During our January 2017 site visit, we located boundary flags hung by The Watershed Company and recorded their location using a hand-held Trimble Geo 7 series GPS receiver to generate the information shown in Figure 3.

A description of the wetland area is included in The Watershed Company's report, along with data sheets and a wetland rating form with figures. The wetland is rated as Category II.

6.0 REGULATIONS

Several local, state, and federal regulations apply to development proposals in and/or near wetlands and streams. A summary of applicable regulatory implications is given below.

6.1 City of Kirkland (City)

Within shoreline jurisdiction, the City regulates the Juanita Beach Park wetlands, Juanita Bay Park wetlands, Juanita Creek, and Lake Washington under Chapter 83 (Shoreline Management) of the KZC (2016). Outside of shoreline jurisdiction, wetland and stream buffers would be subject to regulations in Chapter 90 (Drainage Basins) of the KZC.

For purposes of establishing the limits of shoreline jurisdiction with respect to lakes, Washington Administrative Code (WAC) 173-22-030(4) defines lake as:

> "…a body of standing water in a depression of land or expanded part of a river, including reservoirs, of twenty acres or greater in total area. A lake is bounded by the ordinary high water mark or, where a stream enters a lake, the extension of the elevation of the lake's ordinary high water mark within the stream."

In an environmental review of Phase I improvements of Juanita Beach Park, The Watershed Company (2009) states that "the project area [Oxbow Marsh] is more or less at (and portions at times below) the placid lake level…" An update of the Phase I mitigation plan also states that:

> "the project [Oxbow Marsh creation] is located in the natural depositional zone of the stream system, with a low hydraulic gradient and backwater effects from Lake Washington. This situation is amplified by the reversal of natural seasonal fluctuation of lake levels…, which pairs low stream flows in Juanita Creek with high lake levels in Lake Washington during the summer." (Douglass Consulting, 2010)

KZC 83.80.79 specifies that the Lake Washington OHWM "corresponds with a lake elevation of 18.5 feet, based on the NAVD 88 datum." Based on the WAC definition of lake, the topographic information shown on the available Phase I plan sets, and the 2009 and 2010 documents mentioned above, shoreline jurisdiction extends landward of the Lake Washington OHWM as it extends up Juanita Creek to the culvert underneath NE Juanita Drive (see Figure 5). This conclusion was also confirmed by the City's Planning Manager, Jeremy McMahan, via email on April 8, 2016. This effectively places all of the critical areas and their buffers along Juanita Creek and within the proposed project footprint within shoreline jurisdiction, and subject to the Shoreline Master Program version of the critical areas regulations.

6.1.1 Shoreline Regulations

The proposed Juanita Beach Park Phase II Improvements project is expressly intended to improve the public's ability to enjoy and use the Lake Washington waterfront, which is a Shoreline of Statewide Significance. All uses and modifications in shoreline jurisdiction must be

"designed, located, sized, constructed and/or maintained to achieve no net loss of shoreline ecological functions" (KZC 83.360.1.c).

The majority of Juanita Beach Park is located in the Urban Mixed shoreline environment designation, which has a minimum shoreline setback of the greater of 25 feet or 15 percent of the average parcel depth (KZC 83.180). At Juanita Beach Park, the average parcel depth is conservatively estimated to be 512 feet, based on calculations made using CAD tools consistent with the methodology described in the definition of "average parcel depth" (KZC 83.80(7)). Accordingly, the standard minimum setback from the lake OHWM is 77 feet. Wetland C and most of Wetlands B and D are located in the Urban Mixed designation. Water-related and water-enjoyment commercial uses are allowed, as are water-related and water-enjoyment recreational uses.

The western portion of the park, including Juanita Creek, Oxbow Marsh, and portions of Wetlands Band D, is in the Urban Conservancy shoreline environment designation, which has a setback of 30 feet for water-enjoyment recreational uses and 25 feet for water-related recreational uses. Certain water-related and water-enjoyment commercial uses are allowed if accessory to a public park, as are "other public park improvements" that would be considered water-related and water-enjoyment recreational uses (KZC 83.170). Bioretention swales and similar systems "that allow for filtration of water through planted grasses or other native vegetation" are allowed in shoreline setbacks (KZC 83.190.2.d.6). Pedestrian access facilities and underground utilities are also allowed in shoreline setbacks (KZC 83.190.2.d.1 and 5).

Juanita Bay Park has a Natural shoreline environment designation. Restoration activities are an allowed use in this environment.

6.1.2 Wetland and Stream Regulations

The City regulates wetlands and wetland buffers in shoreline jurisdiction under KZC Chapter 83.500 and assigns wetland buffer widths based on wetland rating and the wetland habitat function, as defined by the wetland's habitat score (KZC, 2016). According to KZC 83.500.4(a), Wetlands A and B have a moderate level of habitat function and are assigned a standard buffer width of 125 feet (Figure 3). Wetland D is assigned a 50-foot standard buffer width. In 2009, the City approved the "paper fill" of Wetland C and the elimination of its buffer. Both the paper fill and actual fill of Wetland C (former Douglass Wetland E) were mitigated in the eastern portion of Juanita Beach Park consistent with City regulations in effect at that time. That mitigation included wetland creation at a 1:1 ratio (Oxbow Marsh) and wetland rehabilitation at a 0.5:1 ratio (in the preserved portion of Douglass Wetland E). However, the

City did not include the paper fill in its request for authorization from the Corps or Ecology, so alteration of the wetland will be regulated by the Corps and Ecology (see Sections 6.2 and 6.3 below).

The City regulates streams and stream buffers in shoreline jurisdiction under KZC 83.510 and assigns stream buffer widths based on stream class and basin category (primary or secondary). Juanita Creek is a Class A stream in a primary basin with a minimum buffer width of 75 feet.

TABLE 1
CITY OF KIRKLAND WETLAND AND STREAM BUFFER WIDTHS

Wetland/Stream	KZC 83 Rating/Type	KZC 83 Standard Buffer Width (feet)
A	Category II	125
B	Category II	125
C	Category III	N/A
D	Category IV	50
Juanita Creek	Class A	75
Juanita Bay wetland	Category II	125

Note:
KZC = City of Kirkland Zoning Code

Stormwater discharges through buffers on the surface are allowed under KZC 83.500.4.c and KZC 83.510.4.c. Utilities are also allowed in critical areas and buffers if they "connect to existing lines in a sensitive area or buffer where no feasible alternative location exists based on an analysis of technology and system efficiency" (KZC 83.500.4.e). Administrative options available for other wetland buffer modifications include: (a) buffer averaging or (b) reducing the buffer by a maximum of one-fourth of the standard buffer with compensatory enhancement in the remaining buffer as part of the underlying permit. The stream buffer could be reduced to 50 feet with compensatory enhancement in the remaining buffer as part of the underlying permit. Reductions of stream or wetland buffers below the level that can be approved by the Planning Director through Process I (KZC Chapter 145) would require a Shoreline Variance with approval first by a Hearing Examiner through Process IIA (KZC Chapter 150) and then by Ecology. This would also require appropriate compensatory mitigation, and would need to demonstrate that additional Shoreline Variance criteria are met. Those criteria include providing proof that "the strict application of the bulk, dimensional or performance standards … precludes, or significantly interferes with, reasonable use of the property" and that "the variance requested is the minimum necessary to afford relief," among others.

An additional structure setback of 10 feet is required upland of stream and wetland buffers, but there are allowances for some modifications of the setback if certain standards are met.

The Corps, in cooperation with Ecology, has developed ratios for conducting permittee-responsible wetland mitigation in western Washington (Ecology, 2006). The City has adopted these wetland mitigation ratios within shoreline jurisdiction in KZC 83.500.8. For unavoidable impacts to Category III and IV wetlands, the City requires compliance with the mitigation ratios shown in Table 2 based on area (area of mitigation: area of wetland impact). No modification of wetlands outside of shoreline jurisdiction is anticipated as part of implementing Phase II of the Juanita Beach Park Master Plan.

TABLE 2
WETLAND IMPACT COMPENSATORY MITIGATION RATIOS
IN SHORELINE JURISDICTION

Wetland Category	Reestablishment or Creation	Rehabilitation	Reestablishment or Creation (R/C) and Rehabilitation (RH)	Reestablishment or Creation (R/C) and Enhancement (E)	Enhancement Only
III	2:1	4:1	1:1 R/C and 2:1 RH	1:1 R/C and 4:1 E	8:1
IV	1.5:1	3:1	1:1 R/C and 1:1 RH	1:1 R/C and 2:1 E	6:1

6.2 State Regulations

Ecology has been authorized to implement Section 401 of the Clean Water Act (CWA) for Water Quality Certification in Washington for most projects that require Corps permits under CWA Section 404 (see Section 6.3). Typically, projects requiring a CWA Section 404 permit also require a CWA Section 401 Water Quality Certification.

The purpose of the certification process is to ensure that federally permitted activities comply with the federal CWA, state water quality laws, and any other applicable state laws. Some general requirements for Section 401, if it is required, include pollution spill prevention and response measures, disposal of excavated or dredged material in upland areas, use of fill material that does not compromise water quality, clear identification of construction boundaries, and provision for site access to the permitting agency for inspection.

Ecology will also review and approve the City's Shoreline Variance decision.

6.3 Federal Regulations

The Corps' CWA Section 404 review process is required for projects involving discharges of dredges or fill materials into the waters of the United States, including non-isolated wetlands and streams. Any proposed impact located within a jurisdictional wetland or stream would require either a Nationwide Permit (NWP) or an Individual permit from the Corps. NWP 42 was established for recreational facilities (including ball fields, sport courts, trails, and "small support facilities, such as maintenance and storage buildings and stables, that are directly related to the recreational activity"), and can authorize up to a one-half acre loss of waters of the United States (jurisdictional streams and wetlands). The Phase I improvements to Juanita Beach Park were approved under NWP 42, as well as NWP 27 for the restoration activities associated with Juanita Creek. The application to the Corps must include information about water quality impacts or any projected changes in base and peak flows that could result directly or indirectly from the project.

Projects that require or trigger a federal permit from the Corps would also require approval under the Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, and National Historic Preservation Act.

7.0 PROJECT IMPACTS

After conducting a thorough mitigation sequencing process, the final project design contains improvements located in wetlands, wetland buffers, stream buffers, and the shoreline setback (Table 3; Figure 6). Other than a portion of the new pavilion(s) and some pathway modification, all activities will take place within shoreline jurisdiction. As a result of the proposed extent of wetland and buffer modification, the project will pursue a Shoreline Variance. The following discussion describes the mitigation sequencing process for the project as a whole, followed by specific supplementary details pertaining to individual project elements, and then quantifies and characterizes the remaining impacts.

TABLE 3
PERMANENT AND TEMPORARY PROJECT ELEMENT IMPACTS IN CRITICAL AREAS OR BUFFERS

Project Element	Wetland C[1]	Wetland D	Wetland Buffer	Juanita Creek Buffer	Shoreline Setback
Relocated bathhouse		●	●○	●○	
Relocated play ground		●	●○		
Lawn /open space rehabilitation	●	●	○	○	○
Pedestrian walkways			●○	●○	○
Sewer connection					○
Stormwater facilities			○	○	○

Notes:
[1] As noted in Section 5.1.3, above, Wetland C was already "paper filled" and mitigated according to City standards as part of Phase I. This Phase II proposal will eliminate the wetland.
● = Permanent Impact
○ = Temporary Impact

7.1 Mitigation Sequencing

KZC 83.490.2.a states that:

> "An applicant for a land surface modification or development permit within a critical area or its associated buffer shall utilize the following mitigation sequencing guidelines, that appear in order of preference, during design of the proposed project:
>
> 1. Avoiding the impact or hazard by not taking a certain action, or redesigning the proposal to eliminate the impact. The applicant shall consider reasonable, affirmative steps and make best efforts to avoid critical area impacts. If impacts cannot be avoided through redesign, *or because of site conditions or project requirements* [emphasis added], the applicant shall then proceed with the following sequence of steps …
>
> 2. Minimizing the impact or hazard by limiting the degree or magnitude of the action or impact with appropriate technology or by changing the timing of the action.
>
> 3. Restoring the impacted critical areas by repairing, rehabilitating or restoring the affected critical area or its buffer.
>
> 4. Minimizing or eliminating the hazard by restoring or stabilizing the hazard area through plantings, engineering or other methods.
>
> 5. Reducing or eliminating the impact or hazard over time by preservation or maintenance operations during the life of the development proposal, activity or alteration.
>
> 6. Compensating for the adverse impact by enhancing critical areas and their buffers or creating substitute critical areas and their buffers as required in KZC 83.500 and 83.510.

7. Monitoring the impact, hazard or success of required mitigation and taking remedial action based upon findings over time.

In the required critical areas study, the applicant shall include a discussion of how the proposed project will utilize mitigation sequencing to avoid, minimize, and mitigate impacts to critical areas and associated buffers. The applicant shall seek to avoid, minimize and mitigate overall impacts based on the functions and values of all relevant critical areas."

The proposed project has gone through an extensive and nearly year-long mitigation sequencing analysis and design process, focused primarily on the location and configuration of the bathhouse with respect to Wetlands C and D. The project's mitigation sequencing process is described below.

7.1.1 Avoid

This process formally evaluated the implications of the following scenarios on the Phase II park improvements: complete avoidance of wetlands and buffers, complete avoidance of wetlands, fill of only Wetland D, and fill of Wetlands C and D. As noted in KZC 83.490.2.a.1, the first step of the mitigation sequencing process (avoid) should consider design modification potential in the context of "site conditions and project requirements." The "site conditions and project requirements" variables analyzed by stakeholders for this project included:

- Degree of critical areas alteration and associated mitigation
- Area of usable public open space
- Safety
- Constructability issues and cost
- Permit complexity and cost
- Schedule
- View obstruction
- Consistency with the Juanita Beach Park Master Plan

The stakeholders involved in the discussions included City Parks and City Planning staff, the City's Park Board, City Council, and City Manager. The stakeholders, including staff, elected officials, and appointed citizens, all concluded that the benefits to the region and local community arising from maximum implementation of the project objectives outweighed the benefits of preserving the critical areas that would otherwise be impacted. As mentioned, all of the impacted wetlands, wetland buffers, and stream buffers are currently mowed lawn that are separated from the lake and Juanita Creek by concrete or asphalt pathways.

The selected alternative avoids impacts to the greatest extent possible (see Table 3 and Figure 6), within the confines of the site conditions and project requirements. While the selected

alternative results in greater wetland impact than identified during Phase I design, this is largely due to the presence of Wetland D, which was not identified during the Phase I design. The selected alternative provides the greatest human safety benefits, maximizes the amount of usable public open space in an already tightly confined and very actively used park, and is the most consistent with the original Juanita Beach Park Master Plan (see Exhibit 1), which was developed using extensive public input and formally adopted by the City Council. The key project requirements for each of the proposed project elements that precluded avoidance of all critical area impacts are listed below:

- Bathhouse: The final orientation and location was compelled by safety factors that favor placement of the lifeguard station close to the water, the substantial concerns raised by property owners whose views might be obstructed if the bathhouse was oriented parallel to the shoreline, the utility of having water-related concessions in close proximity to the lake, and the more intangible improvements to park usability and open space. The bathhouse location was also shifted farther west during the design process to avoid damaging the large weeping willow at the north edge of Wetland D.
- Playground: Park users with children often find themselves dividing their attention between the playground and the water; the proposed playground location will reduce the inherent associated risks to children's safety.
- Lawn rehabilitation: Usable open space at this popular park for seating, sunbathing, play, picnicking, and other activities is at a premium. Currently, large areas of the available mowed lawn are too wet, which limits their use for much of the year. Drainage and soil improvements in Wetlands C and D and the buffers of Wetlands A and B and Douglass Wetland E will increase dry and usable lawn area.
- Pedestrian walkways: Reconfigured pedestrian walkways are necessary in buffers to connect proposed new facilities to each other and to the existing circulation system. The reconfigured pathways are confined to existing lawn or playground areas; impacts to vegetation that contributes to shoreline, stream or wetland ecological function have been avoided.
- Stormwater facilities: Runoff from the new bathhouse will be routed to the west side of the building, and discharged via 2-foot-long slab trench drains filled with cobble. The flow will then be routed into a vegetated bioswale (planted with native shrubs and emergents) along the east side of the existing paved pathway, before finally passing underneath the concrete promenade via a culvert into a gravel "pocket" that is buried a minimum of 8 inches below the ground surface (sand beach). Runoff from the new pavilion will be piped underground to connect to the underdrain system beneath the play area. The water collected from the pavilion and play area will then be piped underneath the concrete promenade to discharge into a second underground gravel pocket. None of the new impervious surfaces are pollution-generating, so water quality treatment is not necessary. The location of the new structures and the

down-gradient slope towards Lake Washington precludes location of these facilities outside of shoreline jurisdiction and outside of buffers. The stormwater facilities are all located in existing lawn or other improved areas, and impacts have been avoided by moving features underground where possible.

- Sewer connection: The relocation of the bathhouse requires a new sewer connection between the restrooms and the sewer main. The Northshore Utility District has mandated that the project connect to the County's existing sewer main parallel to the shoreline. The connection must be made at a manhole located in the concrete promenade. As a result, temporary impacts to Wetland D, buffers and the shoreline setback are unavoidable. As with the other proposed project elements, only lawn or other improved areas will be altered.

The proposed project has avoided alteration of critical areas that provide important food, cover, perch, breeding, resting, or riparian shade functions. For example, the project design has avoided removal of woody vegetation within critical areas, including the tree within Wetland D.

7.1.2 Minimize

The proposed facilities are the minimum size needed to provide an appropriate level of service to meet park users' needs and to satisfy local regulations related to stormwater management and compliance with the Americans with Disabilities Act. As previously mentioned, all permanent and temporary impacts are restricted to lawn or other improved areas. Impacts to wetland and stream buffer and shoreline setback have been minimized by restricting impacts to the existing lawn area or sand beach.

7.1.3 Restore

The temporarily disturbed wetland and stream buffer and shoreline setback areas will be restored to similar or improved pre-project conditions. For example, a mix of native shrubs, groundcovers, and emergents will be planted west of the bathhouse and in the proposed vegetated swale. These areas are currently comprised of lawn. The remaining temporarily impacted buffer areas will be re-seeded with lawn grasses.

7.1.4 Reduce or Eliminate

The project design has reduced and eliminated impacts to critical areas to the extent possible. The project will remove 1,325 square feet of existing pavement and bathhouse structure from Douglass Wetland E's buffer. Also, future park maintenance activities associated with the park's active recreation areas, structures, and utility lines will occur in areas of buffer with minimal buffer function.

7.1.5 Compensate

Chapter 8 of this report describes in detail the proposed mitigation for wetland and stream/wetland buffer impacts. As required by KZC 83.500.10, the proposed off-site wetland mitigation will be in the same basin (South Juanita Slope) as the project impacts (see Figure 2). Stream and wetland buffer mitigation is proposed on-site.

7.1.6 Monitor

Mitigation for impacts to wetlands and buffers will be monitored for 10 and 5 years, respectively, with detailed reports provided to the Corps and the City. See Section 8.4 of this report for a description of the monitoring protocol and conditions, which would trigger preparation of and compliance with a Contingency Plan.

7.2 Wetland Impacts

The project will result in permanent wetland impacts. As noted in Table 3 above, Wetland C will be filled with soil and other amendments to increase the usability of this existing lawn area. Wetland D will be eliminated to construct the replacement bathhouse and relocated play area, and to add soil and other amendments to increase the usability of the existing lawn area. Table 4 quantifies these permanent impacts.

TABLE 4
PERMANENT WETLAND IMPACTS

Wetland	Category	Square Footage (acres)	Percent of Wetland (%)
C	Category III	3,870 (0.089)	100
D	Category IV	4,310 (0.099)	100
	TOTAL	8,180 (0.188)	100

Wetlands C and D are both entirely within areas of active park use and provide extremely limited hydrologic, water quality, and habitat function. As part of Phase I, 5,895 square feet of "paper filled" Category III wetland was mitigated according to City standards in 2011.

The project will not have temporary wetland impacts.

7.3 Buffers/Setback Impacts

The proposed project will result in temporary and permanent stream and wetland buffer impacts and temporary impacts to the Lake Washington shoreline setback (Table 5 and Figure 7).

TABLE 5
BUFFER/SETBACK IMPACTS

Feature	Permanent Impact Area (square feet)	Temporary Impact Area (square feet)
Wetland buffer[2]	8,421	14,904
Juanita Creek buffer	2,149	8,688
NET BUFFER IMPACT[1]	**8,421**	**14,904**
Lake Washington shoreline setback	0	7,612

Notes:
[1] Wetland and stream buffers overlap and, therefore, impact areas overlap so total net square footage of permanent and temporary impacts are only 8,421 and 14,904, respectively.
[2] Buffer impacts for Wetland C were not included in these calculations because the buffer was effectively eliminated and mitigated during Phase I improvements (see Sections 5.1.3 and 6.1.2).

Like Wetlands C and D, the permanent and temporary buffer impact areas identified in Table 5 are entirely in active park use, and consist of maintained lawn, playground structures and fill, the concrete shoreline promenade, picnic benches, the existing bathhouse and its paved apron, and paved walkways. These buffer areas are also separated from higher-quality buffer by heavily used paved trails, rendering them largely non-functional.

The shoreline setback will also be temporarily disturbed during lawn rehabilitation, underground stormwater drainage construction, and installation of the new sewer connection to King County's trunk line that parallels the Lake Washington shoreline. After construction, all temporary buffer impacts to vegetated areas will be restored to existing or improved pre-project conditions by reseeding; some of the temporarily impacted buffer area will be planted with native shrubs and groundcovers as part of the bathhouse's stormwater management system.

8.0 PROPOSED MITIGATION

The proposed wetland and buffer mitigation actions were developed in close coordination with the Green Kirkland Partnership. The Partnership is a division of the City's Parks and Community Services Department. Since 2005, Juanita Beach Park and Juanita Bay Park have been part of the Partnership's program to restore habitat conditions, primarily through invasive species removal and planting of native species. The Partnership has mapped 11 "restoration management units" based on habitat types in Juanita Beach Park and 18 restoration management units in Juanita Bay Park. Most of the work is accomplished by volunteers under the direction of the Partnership.

8.1 Approach

8.1.1 Juanita Beach Park Buffer Mitigation

At present, approximately 3.3 acres of Juanita Beach Park along Juanita Creek are included in the Partnership's restoration plan, and are currently restored and being monitored. We propose to expand Units 10 and 11 to the east, into the bare ground area currently used for observation of beach volleyball (see unit map in Appendix F; Appendix D, Photo 11), and between the new bathhouse and the existing narrow riparian buffer of Juanita Creek to the west extending south to the concrete promenade along the proposed stormwater swale and north to the southwest corner of the parking lot. An existing asphalt pathway which runs from the parking lot south to the concrete promenade, and closely abuts the narrow buffer of Juanita Creek for much of that distance, will be removed. These areas will be vegetated with native trees (west of volleyball court), shrubs, and groundcovers. Enlargement of Units 10 and 11 of the Partnership's planned restoration areas will provide the equivalent of 18,823 square feet of buffer enhancement, 93 percent of which is in the stream buffer, which will benefit Juanita Creek, Wetland A/Oxbow Marsh, and Wetland B (Figures 7 and 9).

As noted above, the impacted buffer areas are all mowed lawn separated from the functional portion of the stream and/or wetland buffer by paved surfaces and the activities of park users. The proposed buffer mitigation will provide buffer functional lift by increasing vegetation structure, increasing cover of native species, enhancing wildlife habitat, and improving screening between the wetland and stream and the busy park facilities.

8.1.2 Juanita Bay Park Wetland Mitigation

A 2008 federal rule titled *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* (Federal Rule) 33 Code of Federal Regulations Section 332.3(b) establishes preferences for wetland compensation in the following order:

a. Wetland mitigation banks,
b. In-lieu fee (ILF) programs,
c. Permittee-responsible mitigation under a watershed approach,
d. Permittee-responsible mitigation through on-site and in-kind mitigation, and lastly
e. Permittee-responsible mitigation through off-site and/or out-of-kind mitigation.

The Federal Rule also states:

> "If, after considering opportunities for on-site, in-kind compensatory mitigation as provided in paragraph (b)(5) of this section, the [Corps] district engineer determines that these compensatory mitigation opportunities are not practicable,

are unlikely to compensate for the permitted impacts, or will be incompatible with the proposed project, and an alternative, practicable off-site and/or out-of-kind mitigation opportunity is identified that has a greater likelihood of offsetting the permitted impacts or is environmentally preferable to on-site or in-kind mitigation, the district engineer should require that this alternative compensatory mitigation be provided."

The following discussion describes the viability of the different mitigation strategies:

1. Mitigation Bank: There is no approved wetland mitigation bank serving the project impact area. The City's code does not recognize mitigation banks as a wetland mitigation strategy in shoreline jurisdiction.

2. ILF Program: As of 2012, King County has an approved ILF program that serves the project impact area. However, the ILF program does not include any restoration sites in the City or in any of the upstream sub-basins (Juanita Creek or Forbes Creek) that drain to Juanita Bay. At present, the list of roster sites for the Cedar River/Lake Washington service area includes projects in only the Lower Cedar River basin, more than 16 miles south of the impact area. The ILF program has up to three years from the time of payment to implement improvements and would therefore result in a temporal loss of wetland function until the mitigation is constructed. The City's code does not recognize ILF mitigation as a mitigation strategy in shoreline jurisdiction.

3. On-Site/In-Kind: According to KZC 83.500.10:

   > "On-site mitigation for a wetland or its buffer is preferable to off-site mitigation. Given on-site constraints, the City may approve a plan to implement all or a portion of the required mitigation off-site, if the off-site mitigation is within the same drainage basin as the property that will be impacted by the project. The applicant shall demonstrate that the off-site mitigation will result in higher wetland functions, values, and/or acreage than on-site mitigation. Required compensatory mitigation ratios shall be the same for on-site or off-site mitigation, or a combination of both."

   As noted in other sections of this report, Juanita Beach Park is already encumbered by significant wetlands, a stream, and their buffers. Creation of additional wetland and associated buffer on-site would be in direct opposition to the overall project's goal of enhancing use of the limited remaining land area for recreation. Aside from the two wetlands proposed for removal as part of this project, all of the other wetlands at the park have already been enhanced as part of Phase I.

4. Off-Site/In-Basin: At present, 97.9 acres of Juanita Bay Park are included in the Partnership's restoration plan, with 10.8 of those acres currently restored and

being monitored. The wetland impact area and the proposed wetland mitigation site all drain into the Juanita Bay area of Lake Washington, and are in the South Juanita Slope basin. The project's proposed wetland mitigation area is currently comprised of a deciduous forest and understory of invasive species, including reed canarygrass, bamboo, English ivy, and Himalayan blackberry (Appendix D, Photos 12 and 13). The proposed wetland mitigation would enhance approximately 0.11 acre of the Partnership's Juanita Bay Park restoration management Unit 07 (Appendix F) by removing invasive species and planting native conifer, shrub, and emergent wetland species (Figure 9, Table 6).

TABLE 6
WETLAND MITIGATION REQUIREMENTS

Wetland	Category	Standard Wetland Enhancement Ratio (for *concurrent* mitigation only)	Phase I "Paper Fill" (Square Feet)	Advance Mitigation Implemented for Phase I "Paper Fill" (Square Feet)	Proposed Phase II Impact (Square Feet)	Remaining Unmitigated Wetland Area (Square Feet)
C (part of former Wetland E)	III	8:1	5,895	5,895 creation 2,948 rehabilitation (@ 1:1 creation and 0.5:1 rehabilitation)	3,870	
D	IV	6:1			4,310	
		TOTAL	5,895	5,895 creation 2,948 rehabilitation (equivalent to 1,474 creation[1])	8,180	811 (8180-7,369)

Note:
[1] Rehabilitation is assigned half the value of creation. Essentially, the 2,948 square feet of rehabilitation is equivalent to 1,474 square feet of creation. The total effective wetland creation is thus 5,895+1,474 = 7,369 square feet.

Wetland mitigation completed as part of Phase I for "paper fill" of Wetland C consisted of 5,895 square feet of creation and 2,948 square feet of rehabilitation. As this mitigation was associated with a paper fill (not a physical impact that altered Wetland C), it is effectively advance mitigation. The implemented wetland creation and rehabilitation has been successful according to agency-required monitoring completed to date, and will continue to be monitored and maintained until all performance standards have been met. Based on the analysis above, which has been reviewed and agreed to by Doug Gresham at Ecology (pers. comm., 29 August 2017), there is only 811 square feet of proposed wetland fill that has not been compensated at an advance creation mitigation ratio of 1:1. At the enhancement ratio required for concurrent mitigation of the remaining 811 square feet of Category IV wetland fill, at least 4,866 square feet of wetland enhancement is necessary.

The proposed use of the Partnership's restoration plan for Juanita Bay Park would provide greater benefit to the impacted Juanita Bay system than any of the mitigation strategies preferred by the Federal Rule. The overall functional lift provided by the wetland enhancement will be supported by an increase in woody species that will help contribute woody debris and other organic material to the wetland, an increase in wildlife habitat opportunities by diversifying available forage and cover for birds and small mammals, and an increase in vegetative structure and diversity that will improve the wetland's hydrologic and water quality functions. Additionally, the enhancements at Juanita Bay Park could be implemented immediately, and would further completion of an ongoing, successful comprehensive restoration plan for this large habitat area.

The existing functioning buffer width associated with the enhanced wetland area cannot be increased to the 125 feet required for Category II wetlands because of the close proximity of existing development (roads and other infrastructure) and private properties. The City recently completed a sidewalk improvement project along 98th Avenue NE, and has enhanced the existing buffer and a small area of wetland immediately adjacent to the proposed wetland enhancement area. The project team has decided not to shift the wetland enhancement area to the west to provide a "buffer" (a mix of wetland and upland) of 125 feet between the wetland enhancements and the roadway, as suggested by the City, because it would place the enhancement area farther waterward of the OHWM, lowering the potential habitat benefits to be gained by the enhancement and lowering the likelihood of successful mitigation. Shifting the mitigation area farther waterward would also have the unintended and adverse consequence that a small island of restoration would occur in a landscape that itself could benefit from restoration, or damage to native communities or further harm to already degraded areas might occur in the process of accessing the mitigation area. An isolated island of enhancement would also be more vulnerable to colonization by invasive species from the surrounding, unenhanced community. This proposal will maximize enhancement without degrading adjacent areas, which meets the ultimate intent of critical areas protection code.

8.2 Mitigation Installation Sequence

The sequences below summarize the steps that should be taken to implement the wetland and buffer mitigation plans.

8.2.1 Wetland Enhancement Installation Sequence

1. Prior to the start of mitigation work, the biologist will use flagging or stakes to identify in the field the locations of the proposed mitigation areas.

2. Install erosion control Best Management Practices (BMPs) as needed and protect existing native woody vegetation in and adjacent to the planting areas. Earth disturbance should be minimized to the extent possible to avoid damaging existing tree roots in the area.

3. With the assistance of the biologist, invasive species shall be identified for removal. To avoid impacting the bird nesting season and high water levels in the lake, invasive species removal shall occur between October 15 and March 1. If water levels in Lake Washington vary significantly from the mean average, invasive clearing may occur outside of the designated window if City approval is granted.

4. Remove existing non-native invasive species such as Himalayan blackberry, English ivy, English holly, and bamboo from the enhancement area using a combination of grubbing and hand pulling/cutting, depending on size of individuals. English ivy vines growing on trees shall be cut at shoulder height and all roots and stems below the cut and along the ground shall be removed from the site and properly disposed of. Himalayan blackberry roots shall be grubbed out. Golden and purple loosestrife shall be hand pulled. Grasp the base of the plant and pull slowly with steady pressure to release the roots from the soil. Older plants with larger roots can be eased out with a garden fork. Remove as much of the root system as possible, because broken roots may sprout new plants. If the plants are in flower or seed, cut off and bag all flower stalks and seed heads before pulling to prevent seed dispersal. All loosestrife plant parts, including flowers, seed heads, stems, leaves and roots, must be securely bagged and discarded in the trash or taken to a transfer station. All other invasive species should be disposed of where they cannot reestablish in critical areas or buffers. Care shall be taken during invasive species removal to preserve native trees and shrubs.

5. After other invasive species are completely removed from the site, remaining reed canarygrass within the mitigation area shall be mowed to ground level. If planting does not occur prior to March 1, new reed canarygrass growth shall be mowed again with a hand-held grass trimmer prior to planting. High water levels in Lake Washington following March 1 will preclude the use of wheeled or tracked equipment in the wetland mitigation area.

6. Procure plants and store properly. Plant material will be native to the Pacific Northwest and from plant stock genomes from Western Washington. Biologist shall review plant material and plant layout prior to planting. Each plant shall be loosely flagged for easy identification during future monitoring visits.

7. Mulch the mitigation areas with 6 inches of wood chips to discourage weed establishment. Hand-dig circular plant pits; take care to avoid cutting through existing native tree roots. Install plants by hand in the planting areas in natural, random clusters. Backfill with native soil that has been mixed with 3 inches of compost. Planting should occur between October 15 and April 1 to take advantage of cool temperatures, precipitation, and low lake levels.

8. Water plants thoroughly after planting to avoid capillary stress. Planted areas shall be watered with approximately 1 inch of water immediately after planting.
9. Remove construction debris and any other unnatural refuse. Remove BMPs after site is stabilized.
10. Landscaper shall submit copies of the planting invoices showing planted species and quantities.
11. Landscaper shall replace all plant mortalities and perform maintenance for one year after installation.

8.2.2 Buffer Enhancement Installation Sequence

1. Prior to the start of mitigation work, the biologist will use flagging or stakes to identify in the field the locations of the proposed mitigation areas.
2. Install erosion control Best Management Practices (BMPs) as needed and protect existing native woody vegetation in and adjacent to the planting areas. Earth disturbance should be minimized to the extent possible to avoid damaging existing tree roots in the area.
3. With the assistance of the biologist, invasive species shall be identified for removal.
4. Remove existing non-native invasive species such as Himalayan blackberry, English ivy, English holly, and bamboo from the enhancement area using a combination of grubbing and hand pulling/cutting, depending on size of individuals. English ivy vines growing on trees shall be cut at shoulder height and all roots and stems below the cut and along the ground shall be removed from the site and properly disposed of. Himalayan blackberry roots shall be grubbed out. Invasive species should be disposed of where they cannot reestablish in critical areas or buffers. Care shall be taken during invasive species removal to preserve native trees and shrubs.
5. Procure plants and store properly. Plant material will be native to the Pacific Northwest and from plant stock genomes from Western Washington. Biologist shall review plant material and plant layout prior to planting. Each plant shall be loosely flagged for easy identification during future monitoring visits.
6. In the flat, sandy portion of the buffer mitigation area adjacent to the existing volleyball court, compost shall be added and mixed into the upper 12 inches of soil.
7. Mulch the mitigation area with 6 inches of wood chips to discourage weed establishment. Hand-dig circular plant pits; take care to avoid cutting through existing native tree roots. Install plants by hand in the planting areas in natural, random clusters. Backfill with native soil that has been mixed with 3 inches of compost. Planting should occur between September 15 and January 15 to take advantage of cool temperatures and precipitation.

8. Water plants thoroughly after planting to avoid capillary stress. Planted areas shall be watered with approximately 1 inch of water immediately after planting.
9. Install wire fencing around each plant installation, around planted clusters, or around the whole mitigation area to protect from beaver herbivory. Install split-rail fencing in specific locations around the buffer mitigation area, as shown on Figure 9.
10. Remove construction debris and any other unnatural refuse. Remove BMPs after site is stabilized.
11. Landscaper shall submit copies of the planting invoices showing planted species and quantities.
12. Landscaper shall replace all plant mortalities and perform maintenance for one year after installation.

8.3 Performance Standards

Native plant survival and invasive cover standards are established to measure enhancement plan success. The proposed performance standards are summarized in Table 7.

8.4 Monitoring Plan

Monitoring shall be conducted at the following time intervals:

- At the time of construction (mitigation plan installation to identify mitigation areas, identify invasive species, and review materials and methods);
- Approximately 30 days after planting to prepare an as-built plan and Baseline Monitoring Report;
- Early in the growing season of the first year to identify invasive species maintenance needs;
- Near end of the growing season of the first year to perform vegetation monitoring;
- Twice the second, third, fourth, and fifth years (at the beginning and end of the growing season); and
- Near end of the growing season of the seventh and tenth (final) years.

TABLE 7
VEGETATION PERFORMANCE STANDARDS

Monitoring Year	Survival (%)	Native Cover	Invasive/Non-native Cover (%)
Wetland Enhancement in Juanita Bay Park			
Year 1	100*	--	≤5
Year 2	--	≥10	≤10***
Year 3	--	≥20	
Year 4	--	≥30	
Year 5	--	≥50	
Year 7	--	≥60	
Year 10	--	≥80	
Buffer Enhancement in Juanita Beach Park			
Year 1	100*	--	≤5
Year 2	--	≥10	≤10
Year 3	--	≥30	
Year 4	--	≥50	
Year 5	--	≥70	

Notes:
* 100 percent (%) survival criteria shall be met by replacing all mortalities the first year after planting.
** Includes native plants that are naturally recruiting. The existing mature tree canopy will not be included in the cover measurements in the wetland enhancement area.
*** Applies to all exotic invasive species except for reed canarygrass in the wetland enhancement area. During the monitoring period, reed canarygrass must be managed and controlled to prevent interference with the growth of native installed vegetation. If weed cover exceeds 10% during vegetation monitoring, this performance standard can be met by removing weeds within 60 days of vegetation monitoring. Any presence of invasive knotweed species (*Polygonum cuspidatum*, *P. sachalinense*, *P. polystachyum*, and *P. x bohemicum*) and related hybrids and purple loosestrife (*Lythrum salicaria*) will not be tolerated.

Below we have outlined proposed monitoring methods, success criteria, and reporting schedule. Monitoring will be conducted by a qualified biologist and will consist of documenting plant mortality and health in Year 1, and estimating percent native cover every year thereafter. Percent cover will be measured using the line-intercept method, or similar, as adapted during the fieldwork. Methodology will be determined and documented during the baseline monitoring effort. Monitoring will also include identifying maintenance needs as they relate to plant survival and weed control.

1. Installation. A biologist will inspect and approve the plant materials prior to installation, including any substitutions. The biologist should also observe plant layout and installation for compliance with the plan details.

2. Baseline Documentation. Within 30 days of completion of the vegetation enhancement installation, the site will be visited to document the as-built condition. The final plant count by species will be verified, and any approved departures from the plan will be mapped and recorded. Recommendations for correcting any unauthorized plan deviations will be included in a Baseline Monitoring Report. Permanent photo points and monitoring transects will be established during the as-built site visit to provide a record of the entire monitoring area. These points will be noted on the map and baseline photos included in the report.
3. Vegetation Monitoring.
    - Years 1 through 5: The wetland and buffer enhancement areas will be visited at the beginning and end of the growing season.
        - The site visit early in the growing season will be used to identify invasive species maintenance needs. Findings will be communicated to the City informally via email. A report will not be prepared.
        - At the end of the growing season, vegetation monitoring will be completed prior to September 30. At the Year 1 monitoring, each installed plant will be assessed and counted, and its condition recorded. Invasive species cover will be visually estimated. In subsequent monitoring years, total percent cover of native and invasive vegetation will be measured. Native volunteer species may be counted in the cover assessment. Signs of beaver activity within the mitigation area will be noted and recommendations for control will be provided. Photos will be taken from each photo point.
    - Years 7 and 10: The wetland mitigation area will be visited once annually at the end of the growing season, by September 30. Total percent cover of native vegetation will be measured, as will presence of invasive species. Photos will be taken from each photo point.

The monitoring reports for the end-of-growing season monitoring visits will be submitted to the City and the Corps by December 31 of each reporting year, and will include the following description/data:

1. Site plan and location map.
2. History of project, including date of plant installation, current year of monitoring, and restatement of performance standards.
3. Plant survival and/or cover of the installed vegetation, in the context of assessing achievement of performance standards.
4. Incidental observations of wildlife or their sign.
5. Assessment of nuisance/exotic biota and recommendations for management.

6. Color photographs taken from permanent photo points established during the baseline visit.
7. Summary of maintenance and contingency measures proposed for the next visit, and those completed since the most recent visit.

Any deficiency discovered during any monitoring or inspection visit must be corrected within 60 days. If any monitoring report reveals that the mitigation plan has failed in whole or in part, and if that failure is beyond the scope of routine maintenance, a Contingency Plan shall be prepared and submitted. Once approved, contingency measures may be installed and will replace the approved wetland and buffer mitigation plan.

8.5 Maintenance

The Contractor will be responsible for maintenance of the mitigation areas for the first year following installation. The City will be responsible for maintenance of the mitigation areas for the remaining four (buffer) to nine (wetland) years of the monitoring period. Maintenance will include weeding around base of installed plants, replacing plants to meet survival requirements, removing all classes of noxious weeds (see Washington State Noxious Weeds List, WAC 16-750-005, with the exception of reed canarygrass, see note in Table 7), and implementing any other measures needed to ensure plant survival.

In the buffer mitigation area, water shall be provided to installed plants during the dry season (June 1 through October 15) for the first year after plant installation for plant survival and establishment. Water should be applied at a rate of one inch of water, once per week.

In the wetland mitigation area, we anticipate that high water levels in Lake Washington during the growing season will obviate the need for manual watering. However, the site should be monitored throughout the growing season by Partnership or City Parks Department staff for signs of dryness and manual watering should begin if necessary.

9.0 CLOSURE

The findings and conclusions documented in this report have been prepared for specific application to this project, and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area, and in accordance with the terms and conditions set forth in our agreement. The conclusions and recommendations presented in this report are professional opinions based on interpretation of information currently available to us, and are

made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

Shannon & Wilson has prepared Appendix G, "Important Information About Your Wetland Delineation/Mitigation and/or Stream Classification Report," to assist you and others in understanding the use and limitations of our reports.

SHANNON & WILSON, INC.

Amy Summe
Senior Biologist/Permit Specialist

SCC:AJS:KLW/scc:ajs

10.0 REFERENCES

Douglass Consulting (Douglass), 2008, Wetland and ordinary high water mark determination report, Juanita Beach Park, Kirkland Washington: Report prepared by Douglass Consulting, Seattle, Wash., for the City of Kirkland, Kirkland, Wash., 255 p., December.

Douglass Consulting (Douglass), 2009, Addendum to Juanita Beach Park wetland and stream mitigation plan, Kirkland Washington: Report prepared by Douglass Consulting, Seattle, Wash., for the City of Kirkland, Kirkland, Wash., 36 p., July.

Douglass Consulting (Douglass), 2010, March 2010 updates to the July 2009 addendum to Juanita Beach Park wetland and stream mitigation plan: Report prepared by Douglass Consulting, Seattle Wash., for the City of Kirkland, Kirkland, Wash., 30 p., March

Green Kirkland Partnership, 2015, 20-year forest and natural areas restoration plan: Available: http://www.kirklandwa.gov/Assets/Parks/Green+Kirkland+Partnership+PDFs/20-Year+Forest+and+Natural+Areas+Restoration+Plan.pdf, accessed March 2017.

J.A. Brennan Associates, PLLC, 2006, Juanita Beach Park master plan report: Report prepared by J.A. Brennan Associates, PLLC, Seattle, Wash., for City of Kirkland Department of Parks and Community Services, Kirkland., 52 p., May.

J.A. Brennan Associates, PLLC, 2009, Figure 12B of 25: Wetland E Grading Plan: Figure prepared by J.A. Brennan Associates, PLLC, Seattle, Wash., for City of Kirkland Department of Parks and Community Services, Kirkland., 1 p., Revised June.

J.A. Brennan Associates, PLLC, 2010, Phase I Improvements Juanita Beach Park: Figure prepared by J.A. Brennan Associates, PLLC, Seattle, Wash., for City of Kirkland Department of Parks and Community Services, Kirkland., 1 p., January 5.

Hruby, Thomas, 2014, Washington State wetland rating system for western Washington 2014 update: Olympia, Wash., Washington State Department of Ecology, Publication no. 14-06-029, 164 p., available: https://fortress.wa.gov/ecy/publications/SummaryPages/1406029.html.

King County, Wash., 2016, King County iMap: interactive mapping tool: Seattle, Wash., King County GIS Center, available: http://www.kingcounty.gov/services/gis/Maps/imap.aspx, accessed January, 2016.

Kirkland, Wash., 2016, Shoreline management (chapter 83) and drainage basins (chapter 90): Kirkland, Wash., zoning code, available: http://www.codepublishing.com/WA/Kirkland/?html/KirklandZNT.html, accessed January 2016.