Appendix E Draft Wetlands Delineation

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Critical Areas Report:
Wetland Delineation and Habitat Assessment

Totem Lake Connector
Kirkland, Washington

for
COWI North America, Inc.

February 15, 2017

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Critical Areas Report:
Wetland Delineation and Habitat Assessment

Totem Lake Connector

NE 124th Street/124th Avenue NE
Kirkland, Washington

File No. 0231-090-00

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INTRODUCTION

This Critical Areas Report has been prepared for COWI North America, Inc. (COWI) to address wetland and habitat baseline conditions at the site of the proposed Totem Lake Connector (project) located at NE 124th Street and 124th Avenue NE in Kirkland, Washington (Figure 1 Vicinity Map). GeoEngineers, Inc. (GeoEngineers) was contracted by COWI to document environmental baseline conditions within the project area, including wetland delineation and assessment of ditches, existing vegetation conditions, and potential fish and wildlife habitat. This report addresses wetlands and streams in accordance with City of Kirkland Zoning Code (KZC) Chapter 90 – Drainage Basins as well as federal Clean Water Act requirements. On December 19, 2016, the City of Kirkland adopted Ordinance 4551 amending KZC Chapter 90 (City of Kirkland 2016a) and this report meets the regulations described in the newly adopted code. This report is intended to be used in design planning and permitting for the project to comply with mitigation sequencing objectives through avoidance, minimization and mitigation measures. Once preliminary design is complete, project impacts will be quantified and mitigation (if needed) will be proposed.

Project Description

The project includes construction of an elevated connection between segments of the existing Cross Kirkland Corridor (CKC) trail spanning the intersection of 124th Street/124th Avenue NE in Kirkland, Washington. Appendix A includes a graphic of the conceptual bridge design and configuration.

The initial concept for the bridge project includes:

- An embankment for the south approach ramp flanked by retaining walls;
- The bridge spanning over NE 124th Street and Totem Lake Boulevard with a "touchdown" support in the triangular property bounded by these roadways and a Rite Aid store on the west; and
- A spiral ramp located just northeast of Totem Lake Boulevard extending over the park and a wetland associated with Totem Lake, transitioning back to the trail alignment.

Project Location

This project is located adjacent to Totem Lake Park in Kirkland, King County, Washington, and spans the intersection of Totem Lake Boulevard, 124th Avenue NE, and NE 124th Street (Figure 1). It is within Section 28 of Township 26 North and Range 05 East of the Willamette Meridian.

Site description

The project area is highly developed with residential and commercial development, transportation infrastructure, and utilities. The project area was originally settled during the 1880s and was initially home to a small shingle mill on the southeast side of the lake, a dairy farm to the south, and on the top of the slope to the north of the lake was a cherry and pear orchard. Development continued in the area and the lake went through several name changes. In 1973, the lake was finally changed to "Totem Lake" at the same time the adjacent mall development began. The 17-acre Totem Lake Park is owned by the King Conservation District and co-managed by the City of Kirkland. The existing CKC trail was developed by the City of Kirkland from an old Burlington Northern-Santa Fe (BNSF) railroad corridor. The trail runs at a southwest to northeast alignment within the project vicinity (see Appendix A). For the purposes of simplicity in discussion, the southwest approach will be referred to as "south" and the northeast approach will be

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referred to as "north" in the remainder of this report. The trail (and former railroad) alignment was graded during construction of the railroad and drainage ditches were constructed at that time on either side of the tracks. South of NE 124th Street, the railroad was created in a cut, and drainage ditches remain on either side of the trail. North of Totem Lake Blvd, the railroad was created on fill, with a drainage ditch on the east side of the alignment and Totem Lake on the west side.

DATA REVIEW

Prior to completing the site assessment, GeoEngineers researched existing information available regarding land cover and critical areas. To complete this inventory, we reviewed the following data sources: City of Kirkland drainage and wetland GIS databases; U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps; United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey; Washington State Department of Natural Resources (WDNR) Forest Practices Application Review System (FPARS); Washington State Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) online maps; USFWS Information for Planning and Conservation (IPaC) data; and the WDNR Washington Natural Heritage Program (WNHP) database (City of Kirkland 2016b; USFWS 2016; USDA-NRCS 2016; WDNR 2016; WDFW 2016; USFWS 2017; WDNR 2016).

Several other recent studies within the project area were also reviewed as part of our analysis. A 2016 technical report by ESA for Phase I of the Totem Lake Park Development was reviewed, which included delineation of the wetland boundary at the northeast end of the Totem Lake wetland, as well as assessment of the Totem Lake wetland as a whole (ESA 2016). This report also included United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey information. As part of the larger CKC Project, Widener and Associates delineated wetlands along the abandoned railroad track within the study area, which includes the areas of the trail associated with the currently proposed bridge (Widener & Associates 2013). The Watershed Company (TWC) also conducted a wetland and stream reconnaissance in 2013 of the Totem Lake Park Master Planning area (TWC 2013).

Wetland and Drainage Data

Wetlands and streams mapped by the NWI (USFWS 2016) and City of Kirkland (2016b) are shown on Figure 2. The NWI database depicts several wetlands adjacent to the proposed project: freshwater forested/shrub, emergent, and ponded wetland habitats are shown encompassing the entirety of Totem Lake and partially overlapping the project area. A second wetland forested/shrub wetland is shown on the south side of Totem Lake Boulevard NE, west of the project site. The City of Kirkland database also identifies these same wetland systems in approximately the same locations. City of Kirkland also identifies an open stream/ditch located on the east side of the existing trail, north of the intersection, as well as a linear wetland feature associated with the ditch. Drainage data (City of Kirkland 2016b) indicates that this ditch/wetland system is hydrologically connected to the drainage ditch on the east side of the trail south of the intersection via a pipe under the road intersection, as well as Totem Lake further to the north (and outside the project area) via a pipe under the trail.

Ditches shown in the City of Kirkland (2016) data are not identified on WDNR FPARS online maps; however, FPARS does consider the open-water portion of Totem Lake to be fish-bearing (WDNR 2016). The WDFW PHS database does not show streams within the project area, but does identify the wetland complex associated with Totem Lake, as well as the smaller wetland on the south side of Totem Lake Boulevard

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(2016). There are no other mapped streams or other habitats identified by these data sources near the project area.

Widener and Associates (2013) delineated wetlands throughout a larger extent of the CKC Trail, including the segment where the bridge will be constructed. The Totem Lake wetland was identified as Wetland CC in this report. The eastern boundary of the Totem Lake wetland was delineated adjacent to the trail, but the wetland was not rated or evaluated for buffers. Widener and Associates also identified the general alignment of two ditches, one on either side of the trail, south of NE 124th Street and a ditch on the east side of the trail north of Totem Lake Boulevard. A linear wetland feature was also identified as Wetland AA on the east side of trail, north of Totem Lake Boulevard, but outside of the current project area. Widener and Associates identify mapped drainage ditches presented in their study as generally jurisdictional under the Clean Water Act, but note some exceptions based on the "relative permanence" of water flow, and do not specify in detail which drainages are jurisdictional. None of the drainages within the current project area were identified as "creeks".

TWC (2013) provided a wetland and stream reconnaissance of the Totem Lake area with a focus on general identification of regulated areas and potential mitigation opportunities. This report does not present a formal wetland delineation, but does include wetland ratings. Totem Lake is identified as Wetland A in this report, is identified as a mix of shrub, emergent and open water components, with a perimeter dominated by invasive species in many locations. The report also identifies Wetland B west of the project area on the south side of Totem Lake Blvd, and Wetland C north of the project area on the east side of the trail, which are generally consistent with the other mapping we reviewed. Wetland A (Totem Lake) is identified as Category II according to the Washington State system; Wetlands B and C are identified as Category III. TWC also identifies "Stream A", which flows into Wetland C and is outside the project area, as well as a ditch on the east side of the trail, north of Totem Lake Blvd NE, which is again consistent with other mapping.

The ESA (2016) report included delineation of the northeast portion of the Totem Lake wetland boundary (Wetland A) for a different project, but did not include delineation of the wetland boundary within the current project limits. However, wetland assessment, including the Washington State wetland rating form, was applied to the wetland as a whole, in accordance with current guidance. Wetland A (Totem Lake) was identified as a Category II wetland according to the Washington State system. This classification is consistent with the prior work completed by TWC.

Soil Survey

Soil map units identified by the NRCS Web Soil Survey (USDA-NRCS, 2016) are shown on Figure 3. According to these data, four soil types are present in the project area:

- Alderwood gravelly sandy loam, 8 to 15 percent slopes
- Indianola loamy sand, 5 to 15 percent slopes
- Kitsap silt loam, 2 to 8 percent
- Seattle muck

The Seattle Muck map unit, which is classified as a poorly drained hydric soil type, corresponds approximately to the Totem Lake wetland complex. Alderwood gravelly sandy loam, Indianola loamy sand

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and Kitsap silt loam are shown primarily in upland portions of the site, but may contain hydric components as summarized in Table 1 below (USDA-NRCS, 2014).

TABLE 1. HYDRIC COMPONENTS TO SOIL COMPLEXES

Soil Map Unit Name	Soil Component Name	Component (%)	Component Landform
Alderwood gravelly sandy loam, 8 to 15 percent slopes	Shalcar muck	3	depressions
Alderwood gravelly sandy loam, 8 to 15 percent slopes	Norma sandy loam	2	depressions
Indianola loamy sand, 5 to 15 percent slopes	Norma sandy loam	2	depressions
Kitsap silt loam, 2 to 8 percent slopes	Bellingham silt loam	3	depressions
Kitsap silt loam, 2 to 8 percent slopes	Tukwila muck	1	depressions
Kitsap silt loam, 2 to 8 percent slopes	Seattle muck	1	depressions

Wildlife Habitat

The City of Kirkland Sensitive Areas Map (2016b) does not identify any bald eagle nests within the project vicinity. The WDFW (2016) PHS mapper does not identify any state sensitive species within the project area. The IPaC data listed the following threatened and proposed threatened species potentially occurring within the project area: marbled murrelet (*Brachyramphus marmoratus*), streaked horned lark *(Eremophila alpestris strigata*), yellow-billed cuckoo (*Coccyzus americanus*), bull trout (*Salvelinus confluentus*), and North American wolverine (*Gulo gulo luscus)*. The threatened and endangered (T&E) species lists from the U.S. Fish and Wildlife Service (USFWS) is included as Appendix B. The WNHP does not include the project location in its database of "Sections that May Contain Natural Heritage Features or Rare Plants" (WDNR 2016). There are no other federal or state listed threatened or endangered species, State Natural Area Preserves, Natural Resource Conservation Areas, Wildlife Areas or Habitats/Species of Local Importance within the vicinity of the project.

FIELD METHODS

GeoEngineers biologists conducted a field assessment on December 19, 2014, to characterize and delineate wetlands and assess other aquatic and terrestrial habitats within the proposed project footprint. Appendix C contains photographs taken during the field visit.

Field assessments included delineation of the Totem Lake wetland boundary adjacent to the project area and general verification of offsite adjacent features within approximately 300 feet of the project site. We did not formally delineate wetlands outside of the project area. Wetland boundaries were marked in the field using survey flagging for subsequent Professional Land Survey (PLS) by 1 Alliance Geomatics, and incorporation onto the project base map.

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Delineation of aquatic critical areas (wetlands and streams) was conducted in accordance with guidelines presented in KZC Chapter 90.35 and 90.85, which references the Washington State Administrative Code (WAC) 173-22-135, which references the federal manual and applicable regional supplements. Consequently, our wetland delineation methods were consistent with the general standard of practice for the area, which is based on the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010). Wetland identifications were based on presence of hydrophytic vegetation, hydric soils, and wetland hydrology, which were formally documented at two sample plots within the project area. Sample plot locations are shown on Figure 4 and datasheets are included as Appendix D.

Ditches within the project area were characterized and documented in the field by identifying the dimensions, drainage path, and vegetation conditions. The ditch configurations were surveyed by PLS for incorporation onto the project base map.

FINDINGS

One wetland (Wetland A, also known as Totem Lake) was identified within the project limits during the field investigation, as shown on Figure 4. Other wetlands identified in our data review were outside of the project area and were not delineated. In addition, two ditches occur within the project area and one ditch was confirmed adjacent but outside the project limits. There were no other wildlife habitats documented within or adjacent to the project. Detailed descriptions are included in the subsequent section.

Wetland Delineation and Assessment

GeoEngineers documented one wetland (Wetland A) within the project area (Figure 4), the boundary of which is generally consistent with prior mapping and studies. The southerly extent of this large wetland overlaps the project boundary and was formally delineated. We established two formal data sample plots to document existing habitat and assist in identifying wetland boundaries (Appendix D) and placed nine wetland boundary flags (A-1 through A-9) for subsequent survey. Other wetlands, including Wetlands B and C, as identified by TWC (2013), were field-verified outside the project limits and were not assessed in detail.

The Wetland A boundary flagged by GeoEngineers was reviewed on January 20, 2017, by the City of Kirkland's contracted wetland subconsultant, TWC. TWC recommended adding an additional point (Flag A-4.5) to the established flagging to finalize the wetland delineation boundary (TWC 2017). GeoEngineers reviewed the recommendation and concurs with the final wetland boundary, as shown on Figure 4. Because the wetland has been thoroughly documented in the recent past (TWC 2013; ESA 2016), GeoEngineers did not re-rate the wetland. Our field observations generally confirm the classification previously established for the Totem Lake Wetland (Wetland A) as documented by TWC and ESA.

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TABLE 2. WETLAND A

Wetland A – Information	
Location	Northwest of the 124th Street/124th Avenue NE intersection
WRIA	8 – King
Local Jurisdiction	King County
Rating/Classification	Category II; as identified by TWC and ESA[1]
Buffer Width	165 feet[2]
Cowardin Class	Palustrine Emergent Forested/Scrub-Shrub
HGM Class	Depressional
Photographs	Appendix C: 1, 3, and 4
Data Forms	Appendix D
Description Summary	
Vegetation	**Herbaceous:** Field horsetail (*Equisetum arvense*), Sedge (*Carex* spp.) **Shrub**: Salmonberry (*Rubus spectabilis*), Pacific willow (*Salix lucida*), Himalayan Blackberry (*Rubus armeniacus*), Sitka willow (*Salix sitchensis*) **Tree:** Cottonwood (*Populus balsamifera*)
Soils	**SP-1:** Meets criteria for hydric soil indicator Redox Dark Surface (F6).
Hydrology	**Indicators**: High water table, surface saturation, ponding. **Source**: Direct precipitation, seasonal high groundwater table, surface runoff

Notes:

[1]Wetland ratings/classification were documented by ESA (2016) and TWC (2013).

[2] Wetland buffer based on wetland classification in accordance with KZC 90.45 (City of Kirkland 2016); the final buffer width is subject to review and approval by the jurisdictional authority.

Wetland A is characterized as a palustrine emergent system with open water, emergent, scrub-shrub and forested elements (Cowardin et al. 1979). Because the Totem Lake wetland (Wetland A) has been thoroughly documented in the recent past, GeoEngineers did not perform wetland rating and instead relied on the results of the previous studies (ESA 2016 and TWC 2013), which are consistent with our general observations (Table 3). Per KZC Chapter 90, wetland functions and required buffers are determined by the wetland category and rating in accordance with the 2014 Update to the Washington State Wetland Rating System (Hruby 2014). Per KZC 90.45, a Category II wetland rated with 6 to 7 habitat points requires a standard buffer of 165 feet.

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TABLE 3. WETLAND CLASSIFICATIONS BASED ON PRIOR STUDIES

Author & Year	Title	Washington State Wetland Rating	Habitat Points
ESA 2016	Totem Lake Park Development – Phase 1	II	7
TWC 2013	Totem Lake Park Master Plan – Wetland and Stream Reconnaissance	II	NA[1]

Notes:

[1] To determine buffer width based on habitat points, wetlands must be rated in accordance to Hruby 2014. TWC 2013 rated Wetland A using the 2006 rating form, which uses a different scale for assigning habitat points and is therefore not applicable to current regulations.

Streams and Ditches

There are no streams within the project area. Ditches were verified on either side of the CKC trail south of NE 124th Street and on the east side of the trail north of Totem Lake Boulevard, as previously mapped (Figure 2). The approximate ditch alignments and representative photographs are shown on Figure 4.

The ditch on the east side of the trail originates outside of the project area to the south but appears to contain only intermittent flow until a point of pipe discharge from the east that occurs within the project area (Figure 2). This ditch is a grass-lined swale approximately 2-3 feet in width at the top of bank and doesn't display a typical Ordinary High Water Mark (OHWM). However, from the point of discharge from the east to NE 124th Street, the flow appears relatively permanent. Flow in the ditch enters a pipe at NE 124th Street which conveys drainage across the intersection to a discharge point on the same side of the trail north of Totem Lake Boulevard. From there, the ditch continues north and enters a wetland system (Wetland C as identified by TWC [2013]) before ultimately entering Totem Lake.

The ditch on the west side of the trail also originates outside of the project area to the south and there are no other point inputs to it within the project area. The ditch continues north and then turns abruptly to the west before reaching NE 124th Street, terminating at a pipe culvert that appears to enter a complex stormwater drainage network before conveying flow into the stormwater pond behind the Comfort Inn, which is shown on Figure 2 and has also been identified as Wetland B by TWC (2013). This ditch consists of a grass-lined swale lacking typical OHWM characteristics. During two site visits in December, both of which occurred within the wet season but during relatively dry weather, flow in this ditch infiltrating before it reached the pipe conveyance at its north end, calling into question the relative permanence of flow connecting this ditch to downstream waterbodies.

Habitat Assessment

Fish and wildlife species presence and habitat use of the property was evaluated through a review of available literature as well as general field observations. We focused primarily on the data review to identify potential fish and wildlife habitat within in the project area. The purpose of field observations was to document potential wildlife habitat physical features (for example, snags, nests, burrows, trails, dens, etc.) that would verify other mapped data.

The WDFW PHS database identifies known locations of state and federally listed sensitive species and priority habitats. According to the WDFW PHS mapper, there are no terrestrial sensitive species located

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within the project area, nor within 300 feet. The species list from the U.S. Fish and Wildlife Service (USFWS) included in Appendix B identifies species and critical habitats designated for protection under the U.S. Endangered Species Act (US-ESA). The USFWS ESA list identifies species and designated critical habitats potentially present within the general vicinity of the project area. The USFWS list includes a total of five federally listed species and no designated critical habitats that may occur near the project, as previously summarized. However, based on our field observations, the occurrence of any of these species within the project area is unlikely due to the level of development and general habitat conditions surrounding the project site, which is isolated from any larger tracts of wildlife habitat. Furthermore, WDFW PHS data do not indicate any documented sightings of these species within 300 feet of the project corridor.

During the field investigation, we did not observe evidence that priority wildlife species are utilizing the project corridor. There are no large bird nests in the few trees that occur within the project limits. The project vicinity, including Totem Lake and its associated wetlands, is expected to be used primarily by human-commensal species such as resident and migratory birds, amphibians and reptiles, and small- and medium-sized mammals such as mice, raccoon, deer, beaver and coyote.

Marbled murrelet habitat, which is identified by USFWS as occurring within King County, is associated with old growth forests, which do not occur on or in the vicinity of the project corridor. Suitable habitat for streaked horned lark is comprised of open grasslands and sparsely vegetated areas, which do not occur at the site. The project site does not contain streams with characteristics suitable for bull trout, which are therefore not anticipated to be present at the site. As such, none of the ESA-listed species are expected to occur at the project site or in the immediate vicinity.

DEVELOPMENT CONSIDERATIONS

As presented in the preceding sections, we did not observe any terrestrial wildlife habitats anticipated to be protected by environmental regulations. We documented one wetland and several ditches within the project limits that may be subject to one or more of the following regulations: federal Clean Water Act; state Hydraulic Code (WAC 220-660); local critical areas ordinance as mandated by the state Growth Management Act (KZC Chapter 90 – Drainage Basins).

Federal Permits

The need for a federal Clean Water Act permit is generally triggered by direct impacts to a Water of the U.S. Based on our assessment, Wetland A (Totem Lake wetland) will be classified as a Water of the U.S., as it is directly connected to downstream waterbodies (e.g., Juanita Creek) with relatively permanent flow and a federal nexus. The ditch on the east side of the CKC trail will also likely be classified as a Water of the U.S., as it too appears based on field observations to contain relatively permanent flow downstream from the point of pipe discharge that occurs within the project limits, as well as a federal nexus.

The ditch on the west side of the CKC trail may or may not represent a Water of the U.S. The ditch was created during construction of the railroad from an upland site when the rail corridor was cut through the landscape. The ditch does not drain any other jurisdictional waterbodies such as streams or wetlands occurring further up-gradient. During two site visits in December, which is the wet season for the area, flow in this ditch was not sufficient to be continuous all the way to the pipe that would otherwise convey it toward a stormwater/wetland pond and then into the Totem Lake system. Additionally, the pipe system this ditch flows into includes a complex system of stormwater pipes providing drainage from roadways and other

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developed infrastructure within the basin; this system discharges into a manmade wetland stormwater pond that provides water quality treatment prior to release into the Totem Lake wetland system and other aquatic habitats further down-gradient, resulting in a questionable nexus with regard to hydrologic or ecologic influence on physical, chemical, or biologic integrity of the system. However, our observations of surface hydrology occurred during relatively dry weather periods and further hydrologic data records have not been obtained or reviewed. To resolve this question, additional hydrologic data should be reviewed, if available, and/or a jurisdictional determination with the USACE can be requested.

If the proposed project design includes fill or other potentially regulated activities (e.g, clearing, grading, etc.) within the delineated boundary of Wetland A or ditches regulated as Waters of the U.S., a Section 404 Clean Water Act permit issued by the USACE will likely be required. A Section 401 permit would also likely be needed from the Washington Department of Ecology. A number of "nationwide permits" (NWPs) are available for projects needing Clean Water Act permits if the project can stay within pre-defined criteria. If the project cannot meet criteria for one of the NWPs, an individual permit may be sought, which would be a more involved and lengthy process, sometimes taking several years or longer. As part of the permit process, mitigation may be required for impacts to Waters of the U.S.

If a federal permit is required, other federal regulations may also come into play including, but not limited to, compliance with the National Historic Preservation Act and Endangered Species Act. Avoiding placing fill and/or structures within Waters of the U.S. as a minimization measure of the proposed project may reduce permit requirements by avoiding the need for a federal permit and/or reducing mitigation obligations.

State Permits

State aquatic permits could be triggered by: regulated activities (clearing, grading, et cetera) within Waters of the State that are subject to the state hydraulic code (WAC 220-660). A Hydraulic Project Approval (HPA) focuses on impacts of a project to fish life, but may be required for activities in non-fish-bearing waters subject to state jurisdiction. Totem Lake is identified by WDNR (2016) as fish-bearing. None of the ditches within the project area are fish-bearing.

Local Permits

The project site is within the local jurisdiction of the City of Kirkland. In accordance with the state Growth Management Act, Kirkland regulates not only activities within wetlands and streams, but also activities that may be proposed adjacent to aquatic habitats within critical area buffers. Totem Lake in its entirety is subject to these regulations as a recognized wetland. Ditches within the project corridor may or may not be subject to local Critical Areas regulation as streams, subject to review and determination by the Planning Official (KZC 90.85), because although the ditches contain relatively permanent or intermittent flow, they are wholly artificial watercourses not containing fish or salmonids, and were not naturally occurring, indicating they do not meet the strict definition of "stream" according to the definition presented in KZC 90.30 § 16.

Development activities proposed within wetlands and/or wetland buffers are subject to local permit review and approval. Mitigation sequencing dictates that efforts are made to avoid, minimize or compensate for unavoidable adverse impacts to regulated critical areas and associated buffers

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SUMMARY

The information presented in this report was prepared in support of the design and environmental permitting anticipated for the Totem Lake Connector project. This report presents the results of our efforts to assess and delineate wetlands and other habitats that may be regulated under the Clean Water Act, state Hydraulic Code, or local critical areas ordinance.

The results of our assessment confirm the presence of a single wetland (Wetland A, also known as the Totem Lake wetland) and several potentially jurisdictional ditches within the project area. These features have been previously documented in several recent prior reports addressing the CKC Trail corridor and other projects in the immediate vicinity. The information presented herein is intended to be used as a basis for mitigation sequencing during project design and for impact evaluation and mitigation planning as the design of the project progresses.

LIMITATIONS

GeoEngineers has prepared this Critical Areas Report in general accordance with the scope and limitations of our existing contract, which is dated January 6, 2017. Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices for the work in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

This report has been prepared for the exclusive use of COWI, City of Kirkland, 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.

The applicant is advised to contact all appropriate regulatory agencies (local, state and federal) prior to design or construction of any development to obtain necessary permits and approvals.

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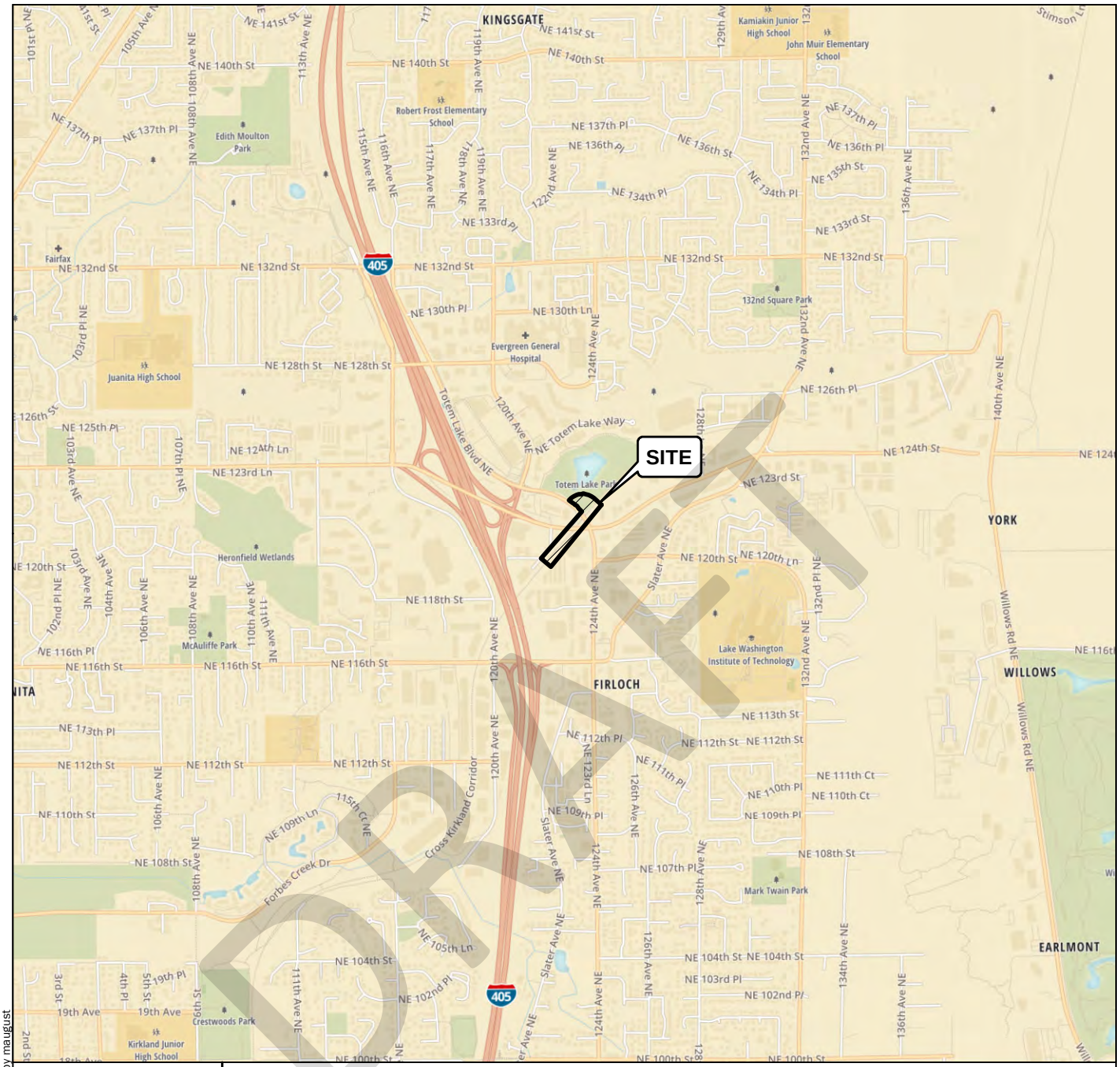

N
W E
S

2,000 0 2,000

Feet

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.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Totem Lake Connector
Kirkland, Washington

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Figure 1

P:\0\0231090\GIS\MXD\0023109000_F01_VM.mxd Date Exported: 02/07/17 by maugust

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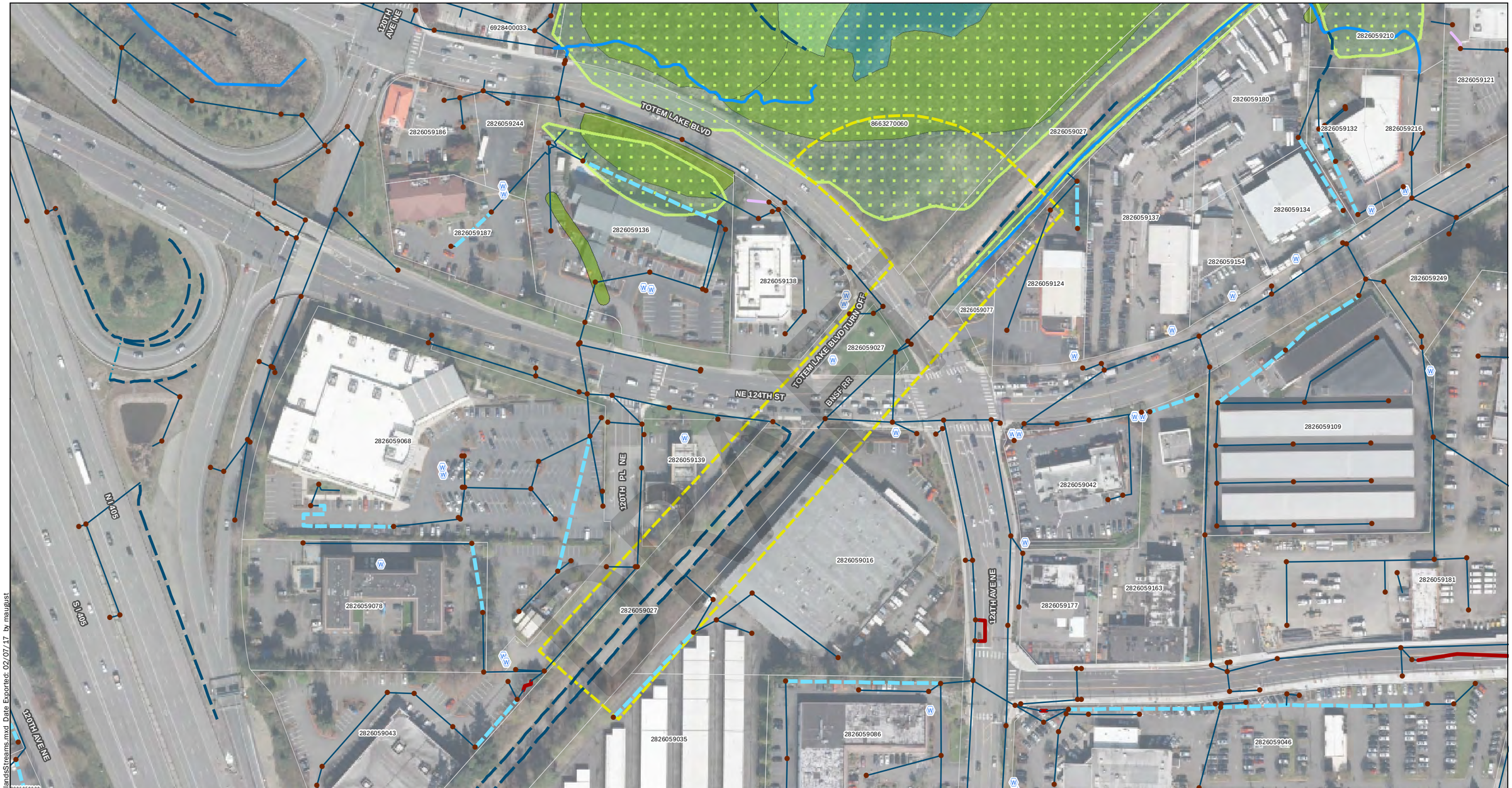


Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers,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

Data Source: Data from City of Kirkland, 2016

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

City of Kirkland Wetlands
- Wetlands

National Wetlands Inventory
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

Stormwater Main
- Culvert
- Pipe
- Tank
- Trench Drain
- Vault

- Project Limits
- Streams
- Drainage Channels
- Tax Parcel
- Storm Water Manhole
- Water Meter

N W E S

150 0 150
Feet

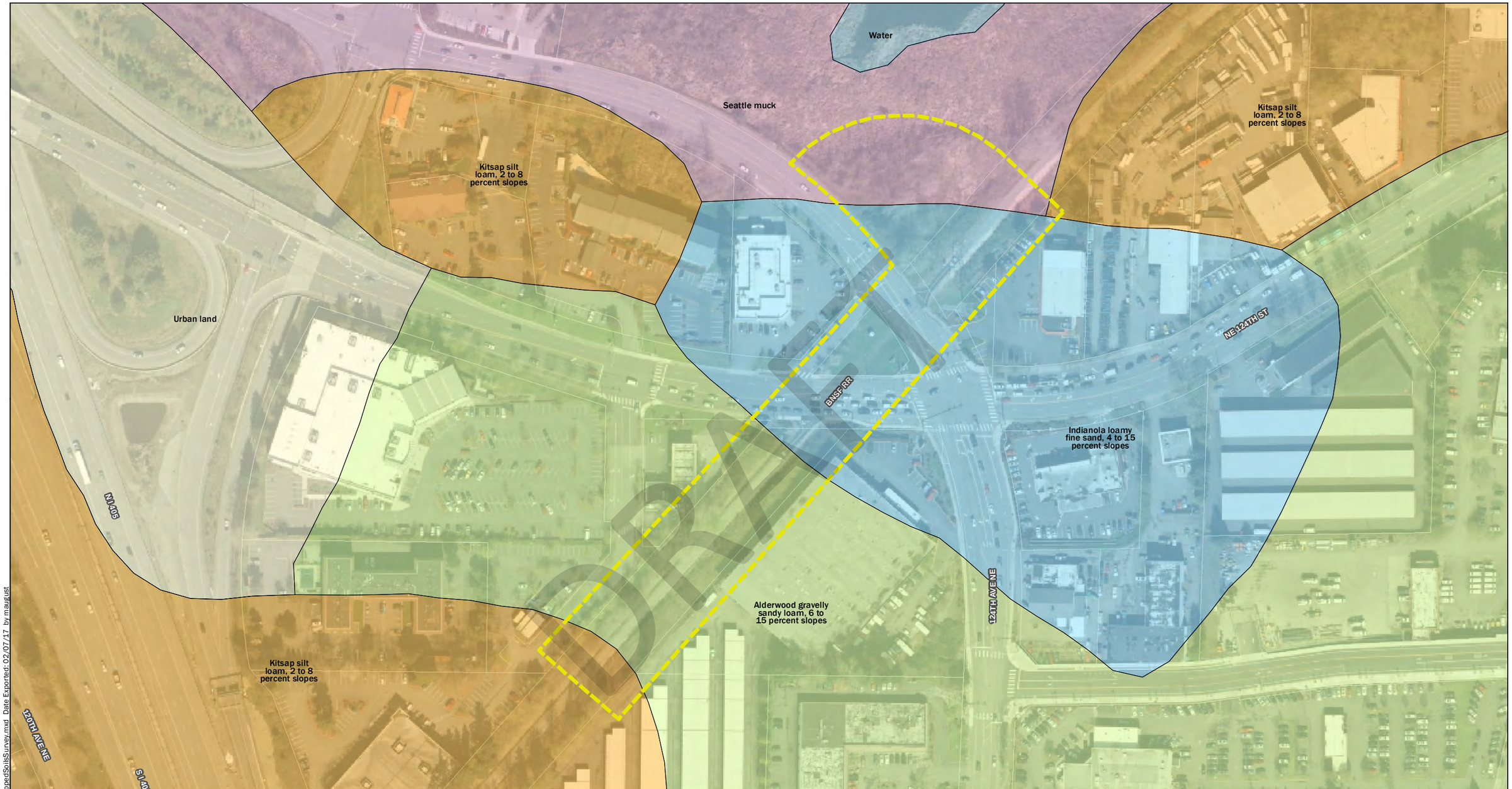
Mapped Wetlands and Drainage Data

Totem Lake Connector
Kirkland, Washington

GEOENGINEERS

Figure 2

P:\0\0231090\GIS\MXD\0231090_F02_WetlandsStreams.mxd Date Exported: 02/07/17 by maugust



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.

Data Source: Data from City of Kirkland, 2016

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

USDA NRCS Soils Data

- Alderwood gravelly sandy loam, 6 to 15 percent slopes
- Indianola loamy fine sand, 4 to 15 percent slopes
- Kitsap silt loam, 2 to 8 percent slopes
- Seattle muck
- Urban land
- Water
- Project Limits
- Tax Parcel

N W E S

150 0 150
Feet

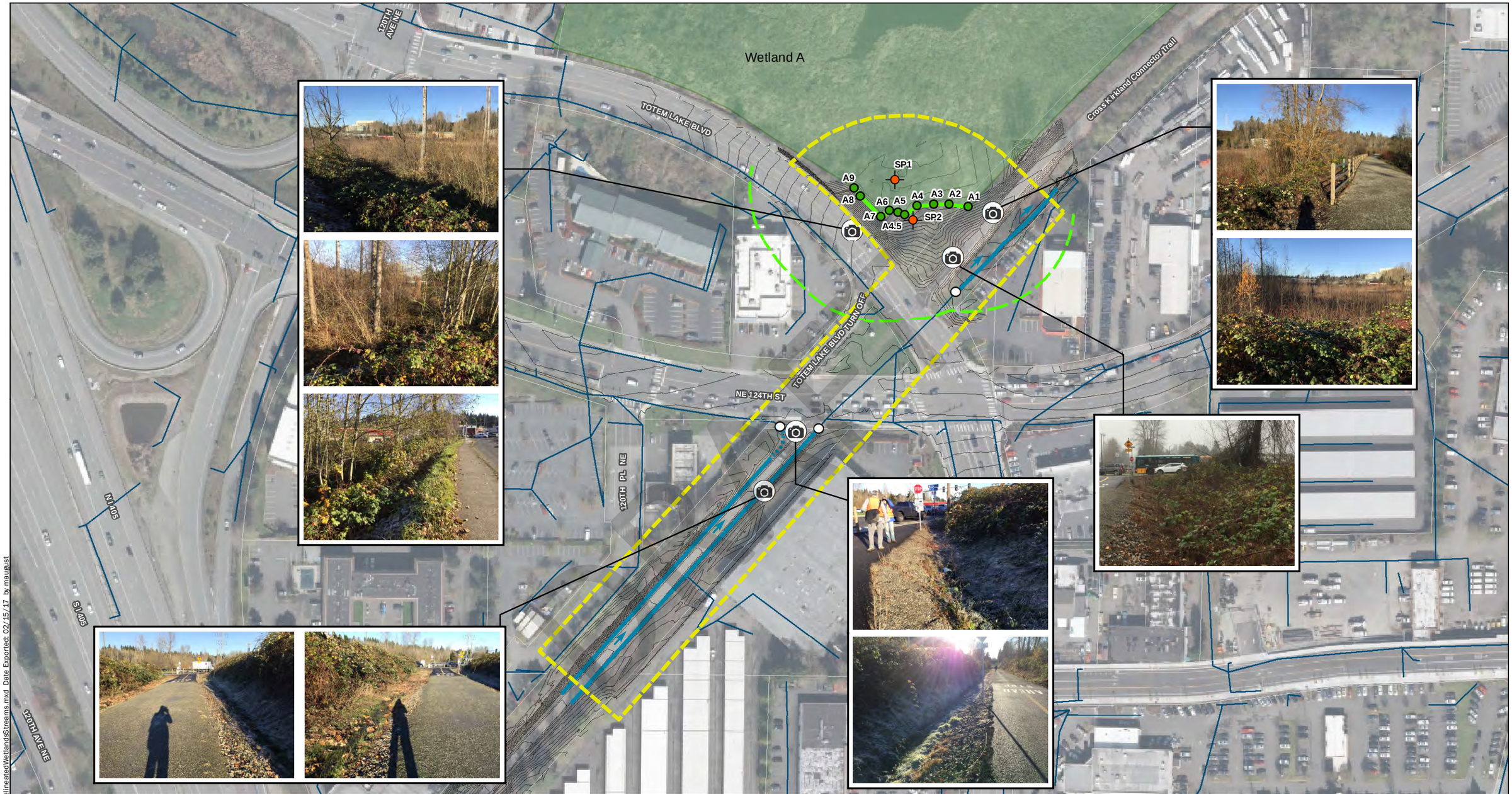
Mapped Soils Survey

Totem Lake Connector
Kirkland, Washington

GEOENGINEERS

Figure 3

P:\0\0231090\GIS\MXD\0023109000_F03_MappedSoilsSurvey.mxd Date Exported: 02/07/17 by maugust



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.

Data Source: Data from City of Kirkland, 2016

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Project Site
Photo Point Location
Wetland Flag
Delineated Wetland
Wetland Buffer (165 ft)
Ditch (Intermittent)
Ditch (Approximate)
City of Kirkland Drainage Pipes
Culvert Inlet/Outlet
Contour Line (1 ft)
Tax Parcel
Sample Plot
Flow Direction

N
W E
S

150 0 150
Feet

Wetland Delineation Results

Totem Lake Connector
Kirkland, Washington

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Figure 4

P:\0\0231090\GIS\MXD\0023109000_F04_DelineatedWetlandsStreams.mxd Date Exported: 02/15/17 by maugust

APPENDIX A
Totem Lake Connector Design Graphic

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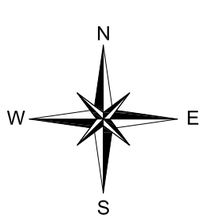
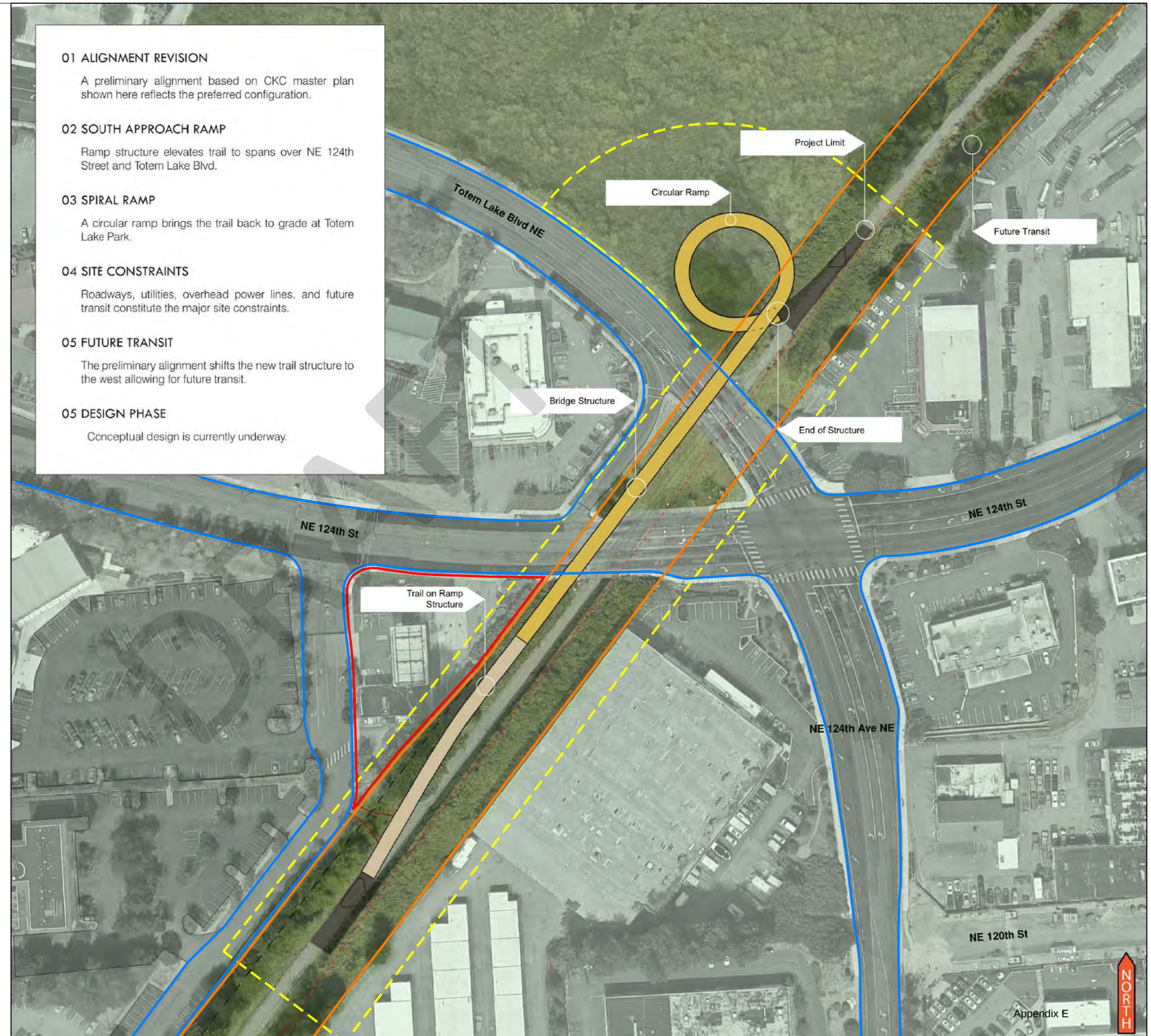
LEGEND:

- City Right-of-way
- Approximate Study Area
- High Risk Site of Concern
- CKC Right-of-way





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APPENDIX B
USFWS Species List

DRAFT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington Fish and Wildlife Office
510 DESMOND DRIVE SE, SUITE 102
LACEY, WA 98503
PHONE: (360)753-9440 FAX: (360)753-9405
URL: www.fws.gov/wafwo/

Consultation Code: 01EWFW00-2017-SLI-0372 January 20, 2017
Event Code: 01EWFW00-2017-E-00432
Project Name: Totem Lake Non-Motorized Bridge

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated and proposed critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. The species list is currently compiled at the county level. Additional information is available from the Washington Department of Fish and Wildlife, Priority Habitats and Species website: http://wdfw.wa.gov/mapping/phs/ or at our office website: http://www.fws.gov/wafwo/species_new.html. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

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A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether or not the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species, and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:
http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). You may visit our website at http://www.fws.gov/pacific/eagle/for information on disturbance or take of the species and information on how to get a permit and what current guidelines and regulations are. Some projects affecting these species may require development of an eagle conservation plan: (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Also be aware that all marine mammals are protected under the Marine Mammal Protection Act (MMPA). The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas. The importation of marine mammals and marine mammal products into the U.S. is also prohibited. More information can be found on the MMPA website: http://www.nmfs.noaa.gov/pr/laws/mmpa/.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Related website:
National Marine Fisheries Service:
http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

Attachment

DRAFT

Official Species List

Provided by:

Washington Fish and Wildlife Office
510 DESMOND DRIVE SE, SUITE 102
LACEY, WA 98503
(360) 753-9440
http://www.fws.gov/wafwo/

Consultation Code: 01EWFW00-2017-SLI-0372
Event Code: 01EWFW00-2017-E-00432

Project Type: DEVELOPMENT

Project Name: Totem Lake Non-Motorized Bridge
Project Description: Construction of an elevated connection between segments of the existing Cross Kirkland Corridor (CKC) trail spanning the intersection of 124th Street/124th Avenue NE in Kirkland, Washington.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

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Project Location Map:

Project Coordinates: MULTIPOLYGON (((-122.17910528182985 47.70664271656532, -122.17957735061647 47.70683042896988, -122.17607975006105 47.709949243838736, -122.17408418655396 47.71097436908258, -122.17369794845582 47.710671165124566, -122.17910528182985 47.70664271656532)))

Project Counties: King, WA

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United States Department of Interior
Fish and Wildlife Service

Project name: Totem Lake Non-Motorized Bridge

Endangered Species Act Species List

There are a total of 5 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Marbled murrelet *(Brachyramphus marmoratus)* Population: U.S.A. (CA, OR, WA)	Threatened	Final designated	
Streaked Horned lark *(Eremophila alpestris strigata)* Population: Wherever found	Threatened	Final designated	
Yellow-Billed Cuckoo *(Coccyzus americanus)* Population: Western U.S. DPS	Threatened	Proposed	
Fishes			
Bull Trout *(Salvelinus confluentus)* Population: U.S.A., conterminous, lower 48 states	Threatened	Final designated	
Mammals			
North American wolverine *(Gulo gulo luscus)* Population: Wherever found	Proposed Threatened		

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Critical habitats that lie within your project area

There are no critical habitats within your project area.

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APPENDIX C
Site Photographs

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Photograph 1. SP-1 Location. Looking northwest (Photo taken December 19, 2016)

Photograph 2. SP-2 Looking southeast (Photo taken December 19, 2016)

Site Photographs	
Totem Lake Connector Kirkland, Washington	
GeoEngineers	Figure C-1

00231-090-00

Photograph 3. Riparian wetland associated with Totem Lake. Looking northwest. (Photo taken December 19, 2016)

Photograph 4. Riparian wetland associated with Totem Lake. Looking west. (Photo taken December 19, 2016)

Site Photographs	
Totem Lake Connector Kirkland, Washington	
GeoEngineers	Figure C-2

00231-090-00

Photograph 5. Typical vegetation in critical area buffer (100 feet) of Totem Lake. Looking south. (Photo taken December 19, 2016)

Photograph 6. Typical vegetation in critical area buffer (100 feet) of Tributary W. Looking southwest. (Photo taken December 6, 2016)

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Site Photographs

Totem Lake Connector
Kirkland, Washington

GeoEngineers

Figure C-3

00231-090-00

Photo 6. Totem Lake wetland buffer. Looking west from trail. (Photo taken December 19, 2016)

Photograph 8. Totem Lake wetland buffer. Looking west from trail. (Photo taken December 19, 2016)

DRAFT

Site Photographs

Totem Lake Connector
Kirkland, Washington

GeoEngineers

Figure C-4

00231-090-00

Photograph 9. Open stream/ditch adjacent to project area on north side of NE 124th Street/124th Avenue NE intersection. Looking northwest. (Photo taken December 19, 2016)

Photograph 10. Southern portion of project site looking down Cross Kirkland Cooridor Trail. Ditches adjacent on either side of path. (Photo taken December 19, 2016)

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Site Photographs	
Totem Lake Connector Kirkland, Washington	
GeoEngineers	Figure C-5

00231-090-00

Photograph 9. Adjacent eastern ditch and related piping. Looking north. (Photo taken December 19, 2016)

Photograph 10. Adjacent eastern ditch. Looking south. (Photo taken December 19, 2016)

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Site Photographs	
Totem Lake Connector Kirkland, Washington	
GEOENGINEERS	Figure C-6

00231-090-00

Photograph 11. Adjacent eastern ditch. Looking north. (Photo taken December 19, 2016)

Photograph 12. Adjacent western ditch. Looking north. (Photo taken December 6, 2016)

Site Photographs	
Totem Lake Connector Kirkland, Washington	
GeoEngineers	Figure C-7

00231-090-00

APPENDIX D
Sample Plots Data Forms

DRAFT

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

Project/Site: City of Kirkland Totem Lake Pedestrian Bridge City/County: King County Sampling Date: 12/19/2016

Applicant/Owner: City of Kirkland State: WA Sampling Point: SP-1

Investigator(s): David Conlin and Emily Duncanson Section/Township/Range: S28, T26N, R5E

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

Subregion (LLR): LRRA Lat: 47.70995 Long: -122.17561 Datum: NAD83

Soil Map Unit Name: Seattle muck NWI Classification:

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	
Wetland Hydrology Present?	☑ Yes	☐ No	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. POPUL	50	Y	FAC
2.			
3.			
4.			
	50	= Total Cover	
Sapling/Shurb Stratum			
1. SALUL	30	Y	FACW
2. POPUL (<20')	35	Y	FAC
3.			
4.			
5.			
	65	= Total Cover	
Herb Stratum			
1. EQAR	35	Y	FAC
2. CAREX	55	Y	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	= Total Cover	
Woody Vine Stratum			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: **4** (A)

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

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

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:	
OBL Species	0	x 1 =	0	
FACW Species	1	x 2 =	2	
FAC Species	3	x 3 =	9	
FACU Species	0	x 4 =	0	
UPL Species	0	x 5 =	0	
Column Totals:	4	(A)	11	(B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problem Hydrophytic Vegetation (Explain)

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

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

Area of test pit is a flat level terrace that gets flooded. Sampled location meets parameter for hydrophytic vegetation.

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SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	**2.5Y 2.5/1**	**100**	--	--	--	--	**mucky**	fibric, dark, greasy
6-11	**10YR 3/2**	**100**	--	--	--	--	**mucky**	fibric, but more decomposed
11-17	**5Y 2.5/1**	**50**	--	--	--	--	**sasi**	
11-17	**10YR 3/1**	**50**	--	--	--	--	**sasi**	

[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)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in 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:

Sampled location meets the required parameter for presence of hydric soils

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):	0 bgs
Water Table Present?	☑ Yes	☑ No	Depth (inches):	2" bgs
Saturation Present? (includes capillary fringe)	☑ Yes	☐ No	Depth (inches):	0" bgs

Wetland Hydrology Present? ☑ Yes ☐ No

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

Remarks:

Test pit meets required parameter for presencets of WL hydrology. High GW, saturated soil.

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

Project/Site: City of Kirkland Totem Lake Pedestrian Bridge City/County: King County Sampling Date: 12/19/2016

Applicant/Owner: City of Kirkland State: WA Sampling Point: SP-2

Investigator(s): David Conlin and Emily Duncanson Section/Township/Range: S28, T26N, R5E

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

Subregion (LLR): LRRA Lat: 47.70995 Long: -122.17561 Datum: NAD83

Soil Map Unit Name: Seattle muck NWI Classification:

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	
Wetland Hydrology Present?	☐ Yes	☑ No	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. ALRU2	60	Y	FAC
2.			
3.			
4.			
	60	= Total Cover	
Sapling/Shurb Stratum			
1. RUAR9	40	Y	FACU
2.			
3.			
4.			
5.			
	40	= 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 30

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: 1 (A)

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

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

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	0	x 1 =	0	
FACW Species	0	x 2 =	0	
FAC Species	1	x 3 =	3	
FACU Species	1	x 4 =	4	
UPL Species	0	x 5 =	0	
Column Totals:	2	(A)	7	(B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problem Hydrophytic Vegetation (Explain)

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

Hydrophytic Vegetation Present? ☐ Yes ☑ No

Remarks:

Sampled location does not meet the required parameter for presence of hydrophytic vegetation.

DRAFT

SOIL

Sampling Point:

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	**7.5YR 3/2**	**100**	--	--	--	--	**salo**	
8-17	**10YR 5/4**	**100**	--	--	--	--	**salo**	

[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)
- ☐ Very Shallow Dard Surface (TF12)
- ☐ Other (Explain in 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:
Sampled location does not meet the required parameter for presence of hydric soils

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:

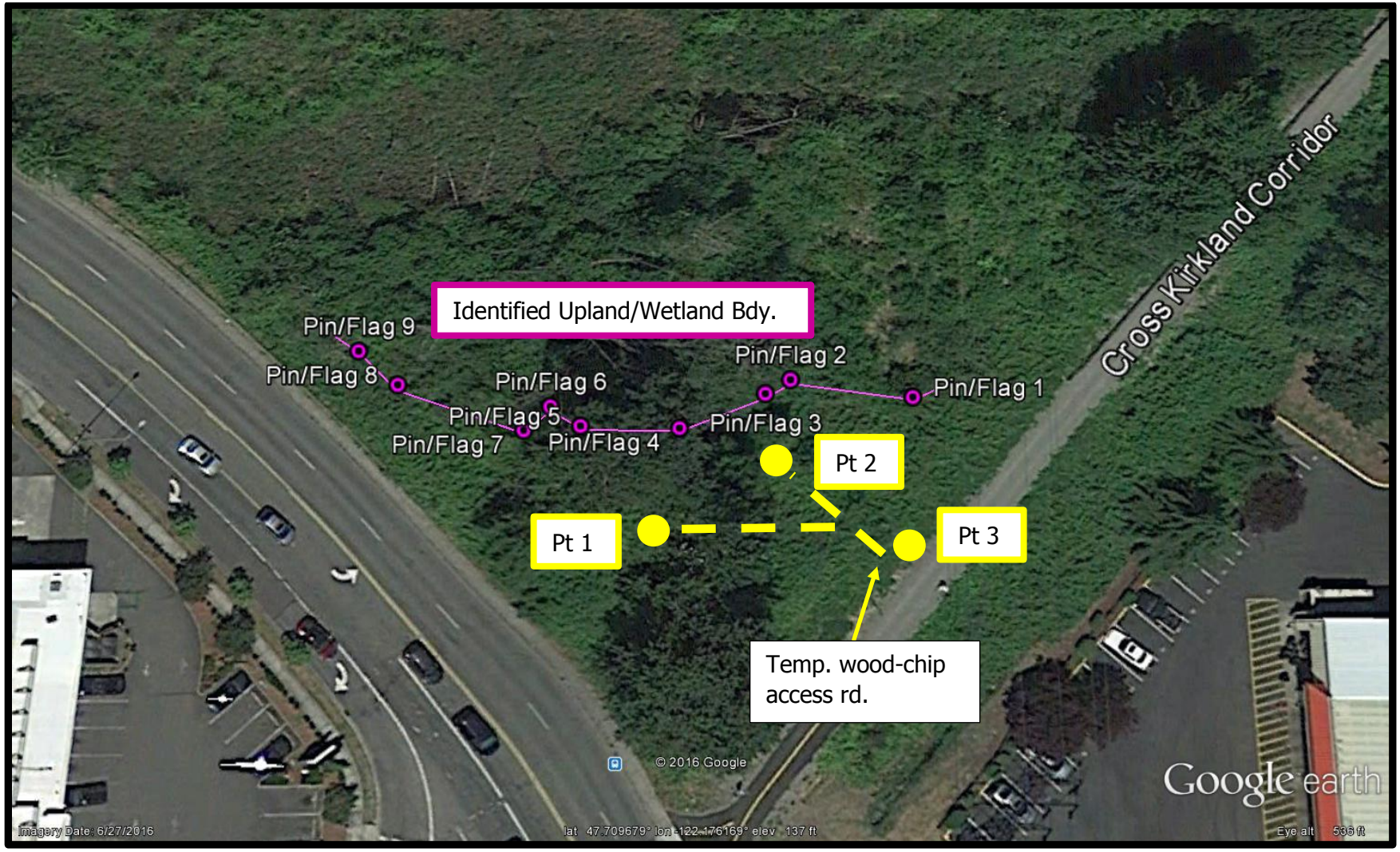
Surface Water Present?	☐ Yes	☑ No	Depth (inches):	0 bgs
Water Table Present?	☐ Yes	☑ No	Depth (inches):	2" bgs
Saturation Present? (includes capillary fringe)	☐ Yes	☑ No	Depth (inches):	0" bgs

Wetland Hydrology Present? ☐ Yes ☑ No

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

Remarks:
Test pit does not meet required parameter for presencets of WL hydrology.

DRAFT



Totem Lake Park – Geotechnical Drilling Locations and Access Road Location (approx.)

January 17, 2017, by A. McDonald, P.E., City of Kirkland Public Works

Kirkland Project # CNM-0086-100, Totem Lake Connector Ped/Bike Bridge