NO NET LOSS OF SHORELINE ECOLOGICAL FUNCTIONS

As requested by the City of Sammamish (letter from Lindsey Ozbolt dated 4-12-17), the following discussion is an analysis of the potential for the project to affect features contributing to shoreline ecological functions.

The City's Shoreline Master Program (SMP) includes regulations that, when met, ensure no net loss of shoreline ecological functions (SMC 25.02.050(6)). Specifically, by avoiding, minimizing and mitigating impacts to shoreline resources, this project complies with the City's SMP and achieves the "no net loss" objective.

According to WAC 173-26-201(3)(d)(i)(D), the overall condition of habitat and shoreline resources are determined by certain ecosystem-wide processes and ecological functions. To demonstrate that construction and use of ELST South Sammamish Segment B will have no net loss of ecological function in the City's shoreline jurisdiction, we have evaluated the potential effects of the project on each of these processes or functions. As shown in the table and discussion below, the project, including minimization and mitigation measures, will have neutral or beneficial effects on each process or function.

Table 1. Potential effects on processes and ecological functions that determine the overall condition of shoreline resources and habitat.

Shoreline Process or Ecological Function (WAC 173-26-201(3)(d)(i)(D))	Project Effects
The distribution, diversity, and complexity of the watersheds, marine environments, and landscape-scale features that form the aquatic systems to which species, populations, and communities are uniquely adapted.	Project effects will be local and will not affect the distribution, diversity, or complexity of watersheds or landscape-scale features.
The spatial and temporal connectivity within and between watersheds and along marine shorelines. Drainage network connections include flood plains, wetlands, upslope areas, headwater tributaries, and naturally functioning routes to areas critical for fulfilling life history requirements of aquatic and riverine-dependent species.	Connectivity of stream networks will be maintained or improved. Replacement of 8 existing culverts with wider, shorter culverts will improve connectivity to approximately 660 feet of upstream habitat between the Interim Use Trail and East Lake Sammamish Parkway, with the potential for access to an additional 46,450 feet of habitat upstream of East Lake Sammamish Parkway. Replacement of the culverts on Pine Lake Creek and Zackuse Creek under East Lake Sammamish Shore Lane will improve connectivity to approximately 200 feet of habitat between Lake Sammamish and the trail crossings on those two streams. Within the shoreline jurisdiction, the project will result in a net gain of 4 linear feet (34 square feet) of stream channel.
The shorelines, beaches, banks, marine near-shore habitats, and bottom configurations that provide the physical framework of the aquatic system.	No project work will take place below or within 10 feet the OHWM of any shorelines of the state.

Exhibit 56
SSDP2016-00415
005555

Table 1. Potential effects on processes and ecological functions that determine the overall condition of shoreline resources and habitat.

Shoreline Process or Ecological Function (WAC 173-26-201(3)(d)(i)(D))	Project Effects
The timing, volume, and distribution of woody debris recruitment in rivers, streams and marine habitat areas.	Most streams in the project area have residences, other private structures, or culverts or catch basins downslope of the project alignment that hinder the movement of woody debris along streams and to Lake Sammamish. In those few streams where that is not the case, and where project construction will remove trees from the riparian area, mitigation planting will ensure no net loss of woody debris recruitment.
The water quality necessary to maintain the biological, physical, and chemical integrity of the system and support survival, growth, reproduction, and migration of individuals composing aquatic and riverine communities.	During construction, a construction stormwater pollution prevention plan will be implemented to minimize and control pollution from project generated stormwater. The new trail surface will be non-pollution generating impervious surface. Although the project proposes driveway reconfigurations, there are no target areas within the project requiring water quality treatment.
The sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	During construction, a temporary erosion and sedimentation control plan will be implemented to minimize and control erosion from stormwater. In the long term, culvert replacements will move streams in the project area toward a more natural sediment regime.
The range of flow variability sufficient to create and sustain fluvial, aquatic, and wetland habitats, the patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows, and duration of flood plain inundation and water table elevation in meadows and wetlands.	No measurable modifications to flow regimes are anticipated in any of the threshold discharge areas (TDAs) that drain the project area. The trail qualifies for an exemption from flow control requirements in 50 of the 56 TDAs. Of the six remaining TDAs, five meet the direct discharge exemption requirements to Lake Sammamish, and an infiltration facility will be used to meet flow control requirements in one (Parametrix 2016).
The species composition and structural diversity of plant communities in river and stream areas and wetlands that provides summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of woody debris sufficient to sustain physical complexity and stability.	As discussed in greater detail below, restoration and enhancement of wetlands, wetland buffers, and shoreline setback areas in the shoreline jurisdiction will ensure the maintenance of plant communities in stream areas and wetlands with a species composition and structural diversity that provides the specified ecological functions.

The project will thus have no effect on the following ecological processes and functions:

- The distribution, diversity, and complexity of watersheds and landscape-scale features
- Shorelines, beaches, banks, marine near-shore habitats, and bottom configurations
- Water quality
- The range of flow variability.

In addition, the project will have beneficial effects on the following ecological processes and functions:

- Spatial and temporal connectivity within and between watersheds
- Sediment regime.

Finally, by applying appropriate measures to mitigate unavoidable impacts, the project will achieve no net loss of ecological function in the shoreline jurisdiction. Mitigation measures include the following:

- Woody debris recruitment: Enhancement of stream buffers along reaches upstream of the shoreline jurisdiction will include the establishment of forested habitat. Woody debris and other organic material recruited to these streams from the buffer enhancement areas will be transported downstream, into the shoreline jurisdiction. As discussed in Section 4.2.2 of the CAS, most of the stream buffers that will be affected by project construction consist of narrow, linear swathes immediately adjacent to the Interim Use Trail. Much of the existing vegetation consists of herbaceous species, landscaped plants associated with adjacent residences, and invasive species such as Himalayan blackberry; native trees and shrubs are present in some areas. Based on the dearth of mature trees in these areas, disturbance of the existing vegetation is expected to have a low potential for adverse effects on woody debris recruitment or other riparian processes and functions. The establishment and enhancement of forested stream buffers in upstream reaches will ensure no net loss of the potential for recruitment of woody debris in the shoreline jurisdiction.
- Species composition and structural diversity of plant communities in river and stream areas and wetlands: As discussed in Section 4.1.3 of the CAS, most of the wetland buffers that will be affected by project construction consist of narrow, linear swathes immediately adjacent to the Interim Use Trail. Existing vegetation consists of herbaceous species, landscaped plants associated with adjacent residences, and invasive species such as Himalayan blackberry; native trees and shrubs are present in some areas. The structural and species diversity of the affected areas is lower than that of the forested and scrub-shrub habitats that will be established in the wetland buffer mitigation areas. The amounts of wetland buffer enhancement and addition and shoreline setback areas in the shoreline jurisdiction will exceed the combined area of impacts to these resources at a ratio of 1.1:1. Moreover, the mitigation plantings will improve the species composition and structural diversity of plant communities in stream buffers as well as in wetland buffers because many of the areas where wetland and wetland buffer mitigation is proposed in the shoreline jurisdiction also fall within stream buffers. As such, wetland buffer mitigation will result in net improvements in the species composition and structural diversity of plant communities in stream areas and wetlands.