King County
Department of Natural Resources and Parks
Wastewater Treatment Division
**Regulatory Compliance and Land Acquisition Services**
King Street Center, KSC-NR-0505
201 South Jackson Street
Seattle, WA 98104-3855

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Robin Proebsting, Senior Planner
City of Mercer Island
9611 SE 36th Street
Mercer Island, WA 98040

North Mercer Island Interceptor and Enatai Interceptor Upgrade Project – Response to City of Mercer Island Request for Information (PAE19-001, CAO19-020, and SHL19-019)

Dear Ms. Proebsting:

This letter is in response to your request for information on the land use permit application materials for the North Mercer Island Interceptor and Enatai Interceptor Upgrade Project (NME Project) on Mercer Island, Washington. This letter addresses comments from the City of Mercer Island (Mercer Island) Community Planning and Development Department and two third party reviewers: (1) Wood Environment & Infrastructure Solutions, Inc. (Wood) and (2) Environmental Science Associates (ESA). In addition, there was an update to the proposed trash rack located on Mercer Island right-of-way adjacent to the North Mercer Pump Station (NMPS), updates to the landscape restoration and impact values, and some minor changes to the proposed schedule.

The information in this response to comments package is considered an amendment to the original land use application materials that were deemed complete by Mercer Island on October 14, 2019. Supplemental information on Lift Station 11 (LS11) was provided to Mercer Island on November 6, 2019, associated with meeting a reduction in impervious surface area within Fruitland Landing Park. This supplemental information was referenced by ESA as the *North Mercer Island Interceptor and Enatai Interceptor Upgrade Project – Fruitland Landing Park (Lift Station 11) Update for Shoreline Permitting*. As requested, the supplemental information for LS11, and other updated information associated with the land use permit application materials, was incorporated into the revised Critical Areas Study (CAS), Project Narrative (PN), Code Compliance Narrative (CCN), and Development Plan Set (PLAN). These revised documents are included in this response to comments package. No other materials from the original land use permit application have been updated.

Table 1 below summarizes the comments and responses detailed in this letter, including a cross reference for the report sections or drawing numbers that were revised. Detailed responses for each reviewer (i.e., Mercer Island, Wood, and ESA) are included in the sections below Table 1. Note that, if the comment indicated that the reviewer agreed with the conclusions of the report, that comment was noted but not added to this response to comments package.

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**Table 1. Summary of Comments and Revised Materials for the Mercer Island Land Use Permit Application**

| Report / NME Project Element | Comment | Cross Reference (report section or drawing) |
|---|---|---|
| **Development Plan Set (PLAN Version)** | | |
| NMPS | Calculate the Gross Floor Area of the existing pump station and proposed generator building, per MICC 19.16 | • Attachment 1 (new)<br>• CCN Section 4.2 |
| NMPS | Calculate the total existing and proposed impervious surface on the NMPS site, per MICC 19.02.060 | • Attachment 1 (new)<br>• V1: PLAN Sheet G012<br>• CCN Section 4.2 |
| Conveyance along SE 22nd Street | Provide height of the proposed temporary improvements along SE 22nd Street, including the TPS transformer, bioxide totes, temporary retaining wall, and stream diversion dam and show compliance with MICC 19.02.020(C)(3) | • V1: PLAN Sheet T-C101<br>• CCN Section 4.2 |
| General Review Comment | The drawing index included with the plan set appears to not match the sheets provided in the plan set | • V1: PLAN Sheet G002, G003<br>• V2: PLAN Sheet G002, G003, G004 |
| **Geotechnical Design Memorandum (GEO)** | | |
| Mercer Island Boat Launch | Impacts to steep slopes at the eastern shoreline near the Mercer Island Boat Launch need to be addressed, demonstrating how the criteria in MICC 19.07.160(B)(2) are met | • Attachment 2 (new)<br>• GEO Section 4.4 Geologic Hazards<br>• CCN Section 4.2 |
| General Review Requirements | Supplemental letter/report from geotechnical professional addressing specific items related to geologically hazardous areas, per MICC 19.07.160(B)(2), 19.07.160(B)(3), and MICC 19.07.110(B)(11) | • Attachment 2 (new)<br>• CCN Section 4.2 |
| Statement of Risk | Provide a statement of risk for work within the Shoreline Jurisdiction consistent with MICC (2017) 19.07.060(D)(2) | • Attachment 2 (new)<br>• CCN Section 4.2 |
| Development Standards | Address the seasonal use criteria in MICC 19.07.160(F)(2) | • Attachment 3 (new)<br>• CCN Section 4.2 |
| Development Standards | Add discussion of the potential impacts for the planned construction through geologically hazardous areas to existing structures, roads, utilities, and other facilities along the proposed alignment. | • Attachment 2 (new) |
| **Critical Areas Study (CAS)** | | |
| Best Management Practices | No fish exclusion measures were mentioned as BMPs for Mercer Island Boat Launch or East Channel crossing | • CAS Section 4.3<br>• PN Section 2.3 |
| LS11 at Fruitland Landing Park | Provide a figure graphically showing which portions of the site would be pervious landscape and which would be grass | • PLAN Sheet L601<br>• Attachment 4 (new)<br>• CCN Section 4.2 |
| LS11 at Fruitland Landing Park | Revise the CAS to be consistent with the impervious surface calculations shown in the memo titled *North Mercer Island Interceptor and Enatai Interceptor Upgrade Project – Fruitland Landing Park (Lift Station 11) Update for Shoreline Permitting* dated November 6, 2019 | • CAS Section 4.2, 5,2, and 6.2<br>• CCN Section 4.2<br>• PN Section 2.2 |
| LS11 at Fruitland Landing Park | Provide details on the type of pervious surface proposed for the improvements at LS11, demonstrating how the definition of "impervious surface" per MICC 19.16.010.I(5) | • CAS Section 4.2<br>• CCN Section 4.2<br>• PN Section 2.2 |
| LS11 at Fruitland Landing Park | With regards to pervious surfaces, follow the recommendations in the King County 2016 Surface Water Design Manual – Simplified Drainage Requirements (Appendix C) | • CAS Section 4.2<br>• CCN Section 4.2<br>• PN Section 2.2 |

CAS = Critical Areas Study; CCN = Code Compliance Narrative; GEO = Geotechnical Design Memorandum; PLAN = Development Plan Set; PN = Project Narrative; TPS = Throttle Position Sensor; V1 = Development Plan Set Volume 1; V2 = Development Plan Set Volume 2

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## DEVELOPMENT PLAN SET

The PLAN Sheets were originally provided on September 27, 2019, and revised per Mercer Island criteria and accepted on October 14, 2019, as part of the land use permit application package. The PLAN Sheets were broken down into two separate volumes. Volume 1 (V1) contained information regarding the North Mercer Pump Station (NMPS) and LS11 at Fruitland Landing Park work areas, while Volume 2 (V2) contained information about the rest of the pipeline conveyance on Mercer Island.

The following information from the PLAN Sheets is provided below, as requested:

**Mercer Island Comment**: Please calculate the Gross Floor Area (GFA) of the existing pump station and proposed generator building using the definition of Gross Floor Area in MICC 19.16.

***Response:*** *The GFA, per MICC 19.02.020(D)(1), for the proposed NMPS generator building is 1,376 square feet (SF). This is excluding the Basement Floor Area, per MICC 19 Appendix B. The existing pump station has a GFA of 1,804 SF for the one level above grade (with 150% allowance for the portion of a room with ceiling heights of 12 feet to16 feet measured from the floor surface to the ceiling, per MICC 19.02.020(D)(2)(a)). The existing floors that are entirely below grade have been excluded as these would be deducted under the Basement Floor Area deductions anyway. The combined (as proposed) GFA for NMPS is 1,228 SF + 1,804 SF = 3,032 SF. This is below the 5,000 SF limit allowed within the R-8.4 zoning restrictions.*

*Please refer to Attachment 1 for a visual of this calculation.*

**Mercer Island Comment:** Please calculate the total existing and proposed impervious surface on the NMPS site, demonstrating compliance with MICC 19.02.060.

***Response:*** *The lot size is 37,265 SF and there will be 4,940 SF (+13%) of new impervious surface area at NMPS for a total of 10,758 SF (29%). Note that this is a reduction from the original calculation of impervious surface area presented in the land use application materials. The original calculation was for an increase of 5,300 SF at NMPS.*

*The lot slope is calculated by subtracting the lowest existing elevation (elev. 121.0 feet at inlet to box culvert) from the highest existing elevation (elev. 147.5 feet in the southwest corner of lot) and dividing the resulting number (26.5) by the shortest horizontal distance between these two points (250 feet) as shown on PLAN Sheet Volume 1: G012. The resulting slope is 10.6%. MICC 19.02.060 allows a maximum impervious surface of 40% for lot slopes less than 15%, and so the increase in impervious surface area is in compliance with the code.*

*Please refer to Attachment 1 for a depiction of the high and low spots from which lot slope was calculated.*

**Mercer Island Comment:** Please provide information about the height of the proposed temporary improvements along SE 22nd Street, including the TPS [Temporary Pump Station] transformer, bioxide totes, temporary retaining wall, and stream diversion dam and show compliance with MICC 19.02.020(C)(3).

***Response:*** *The following provides the height of the proposed temporary improvements along SE 22nd Street (as shown on Volume 1 Drawing, T-C101) and demonstrates compliance with MICC 19.02.020(C)(3):*

- *Temporary Fence: The North Mercer Pump Station site will be temporarily fenced during construction. The fence will be six feet tall and will have a vinyl banner attached to limit the view into the site. Under MICC 19.02.050(E) (as referenced in MICC 19.02.020(C)(3)(c)), the height of the fence will not exceed the maximum height of 72 inches.*
- *Temporary Pump Station (TPS): Within the fenced area will be the temporary pump station (TPS), which will set less than a foot above grade.*
- *Electrical and Power Systems: Within the fence will be power systems and electrical trailers at about 12 feet tall, and a standby generator set at about 14 feet tall.*
- *Temporary Odor Control Systems: A mobile odor control unit at about 8 feet tall shall provide odor control for the TPS during construction, and bioxide chemical totes at about three feet tall will provide chemical injection to reduce sulfides in the system.*
- *Temporary Electrical Transformer: Outside the fence along the street will be a temporary electrical transformer up to about six feet tall.*
- *Temporary Retaining Wall: Along the western property boundary, a temporary retaining wall will extend from zero feet tall near SE 22nd Street to about maximum of about 8 feet tall adjacent to the planned generator building. Under MICC 19.02.050(E), for Cut Slopes (as referenced in MICC 19.02.020(C)(3)(c)), the height of the retaining wall shall not exceed the maximum height of 144 inches.*
- *Temporary Dam: During the installation of sewer force mains across the existing stream, a temporary dam will be built across the stream to allow for the trenching work to progress in dry conditions. This will be up to about four feet high, but because it is set down into the creek, is well below the predominant site grade.*

*This temporary equipment is shown on PLAN Sheet Volume 1: T-C101.*

**Mercer Island Comment:** The drawing index included with the plan set appears to not match the sheets provided in the plan set. It is understood that the parts of the index have been shaded red to indicate that they are not part of the plan set. However, there are sheets listed in the index that are not shaded red and that are not included in the plan set. There are also sheets that are not listed in the index that are included in the plan set.

***Response:*** *The drawing indexes were updated to match the sheets provided in the plan sets by volume. Volume 1 is the NMPS and LS11 construction package, and Volume 2 is the conveyance package.*

## GEOTECHNICAL DESIGN MEMORANDUM

**Mercer Island Comment:** Impacts to steep slopes at the eastern shoreline near the Mercer Island Boat Launch need to be addressed, demonstrating how the criteria in MICC (2019) 19.07.160(B)(2) are met.

**This is a summary of the comment from Wood:** The Shannon & Wilson memorandum does not address the steep slope area (which also shows bank erosion along the waterfront) at the eastern

shoreline (Mercer Island Boat Launch). This is generally in the vicinity of project Station 207+00 to 210+50. While a restoration design is included in the project plans, the stability of this area is not discussed in the geotechnical report.

***Response:*** *Attachment 2 is a memorandum that provides responses from Shannon & Wilson associated with construction within geologically hazardous areas, including construction within the steep slope area at the Mercer Island Boat Launch. In summary, the very dense, sandy silt and hard, silty clay soils encountered in the steep slope at the site have high shear strength and are not susceptible to landslide activity or slope instability. The East Channel Siphon will be installed mostly perpendicular to the steep slope and the construction will be conducted in limited lengths. Therefore, during construction the risk of landslides within the steep slope is minimal and the site will remain safe. Because the siphon will be constructed in limited lengths and returned to the original grade and condition, the pipeline, when completed, will be as safe as if it were not located in a steep slope hazardous area and will not adversely impact the slope or adjacent properties.*

*Note that this summary was also incorporated into the revised CCN (Section 4.2).*

**Mercer Island Comment:** Provide a supplemental letter or report from the geotechnical professional to address code criteria pertaining to geologically hazardous areas, including MICC 19.07.160(B)(2), 19.07.160(B)(3), and MICC 19.07.110(B)(11).

**This is a summary of the comment from Wood:** Because Confluence (not Shannon & Wilson) prepared the Critical Areas Study, there needs to be a supplemental letter/ report from the geotechnical professional to address specific items pertaining to geologically hazardous areas. This includes the following:

- MICC (2019) 19.07.160(B)(2) - Statements and supporting documentation are required that indicate the proposed alteration: (a) will not adversely impact other critical areas; (b) will not adversely impact the subject property or adjacent properties; (c) will mitigate impacts to the geologically hazardous area consistent with best available science; and (d) includes landscaping of disturbed areas and hardscaping prior to final inspection;
- MICC 19.07.160(B)(3) - the geotechnical professional provides a statement of risk (a, b, c, or d as appropriate); and
- MICC 19.07.110(B)(11), the geotechnical professional needs to confirm they have reviewed the design, and that the plans are consistent with their report recommendations.

***Response:*** *Attachment 2 is a memorandum that provides responses from Shannon & Wilson associated with construction within geologically hazardous areas. The geotechnical professional reviewed the appropriate Mercer Island code and design to confirm that the design is both consistent with MICC and the original recommendation within the GDM. Attachment 2 includes three separate memorandums by the geotechnical professional: (1) along the conveyance alignment (pp. 3-14), (2) NMPS (pp. 15-16), and (3) LS11 (pp.17-19).*

*In general, all areas were identified as minimal risk for construction activities within designated landslide hazard areas or seismic hazard areas. Further proposed construction is consistent with MICC 19.07.160(B)(2) and MICC 19.07.160(B)(3). Based on the geotechnical engineer's review and evaluation, the NME Project elements and construction methods are minor in nature and will not*

*increase the risk of landslide, erosion, or harm from seismic activity. Within the geologically hazardous areas, the pipeline and ancillary facilities of the NME Project will be constructed along in shallow trenches of 15 feet or less and will be backfilled to match the existing grade and surface conditions. In the landslide hazard areas, the pipeline and facilities are either located in glacially overridden very dense or hard deposits that are not susceptible to landslide activity, or will be constructed near the top of the landslide hazard area, which during construction unloads the slope and reduces the risk of landslide activity. After installation, the pipeline and fill will weigh the same as or less than the existing condition. In the seismic hazard areas, the pipeline and facilities are either located in glacially overridden very dense or hard deposits that are not susceptible to liquefaction or seismic-induced settlements are within magnitudes that can be mitigated by the pipe design.*

*The following is a summary of the locations highlighted in Attachment 2. Note that steep slopes at the Mercer Island Boat Launch were addressed above.*

- *Along the Conveyance: The NME Project will meet the conditions of MICC 19.07.160(B)(3)(a) and MICC 19.07.160(B)(3)(c):*

  *SE 22nd Street (Station [Sta.] 1+64 to 5+50): The NME Project will be constructed in limited lengths and returned to the original grade and condition. Therefore, the force mains, when completed, will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties. Based on the project plans, the force mains will be founded in stiff to very stiff clay. These soils are not susceptible to seismic hazards, including liquefaction or lateral spreading.*

  - *SE 24th Street (Sta. 19+20 to 24+58): The soils along SE 24th Street consist of about 5 feet of medium dense fill over about 7 feet of stiff silts and clays (recessional lacustrine deposits), and groundwater was not encountered. The subsurface soil and groundwater conditions along this section is not potentially liquefiable or susceptible to lateral spreading.*

  - *81st Avenue SE (Sta. 25+60 to 29+40): The soils along 81st Avenue SE consist of very dense or hard silts and clays (glaciolacustrine deposits), and groundwater was encountered at a depth of 35 feet below ground surface (bgs). The soil and groundwater conditions along this section is not potentially liquefiable or susceptible to lateral spreading.*

  - *Shorewood Drive (Sta. 61+32 to 61+67): The soils along this section consist of about 17 feet of medium dense to very dense fill over about 5 feet of loose recessional outwash with groundwater at a depth of about 17 feet bgs. These soils are potentially liquefiable but not susceptible to lateral spreading. The GDM indicates that liquefaction-induced settlements of 2 to 2.5 inches may occur in this area. The force mains through this section have been designed to accommodate the potential settlement.*

  - *90th Place SE (Sta. 71+75 to 73+11): The dense to very dense till and till-like soils encountered at the site have high shear strength and are not susceptible to landslide activity. Due to the steepness of the grade in this area, trench dams were recommended to prevent groundwater migration and erosion of the backfill soils. The trench drains have been included in the design.*

- *I-90 Trail (Sta. 74+62 to 78+05): The gravity sewer will be installed along the top of the existing slope in limited lengths, and the slope will be temporarily unloaded, which reduces the risk of landslide activity along the trail and to neighboring properties. Because the final installed pipeline will weigh the same or less than the current condition, when completed, will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties.*

- *I-90 Trail (Sta. 81+23 to 82+35): The site is relatively flat with no nearby slopes, and the construction of the gravity sewer in this section is so minor that it does not pose a threat to the public health, safety and welfare.*

- *SE 35th Street (Sta. 88+80 to 90+30): The gravity sewer will be installed along the top of the existing slope in limited lengths, and during construction the slope will be temporarily unloaded, which reduces the risk of landslide activity along the roadway and to neighboring properties. Because the final installed pipeline will weigh the same or less than the current condition, the gravity sewer through this section, when completed, will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties.*

  *The soils along SE 35th Street consist of 12 feet of dense to very dense fill over very dense, glacially overridden advance outwash deposits. Groundwater is deeper than 25 feet along this section. The soils and groundwater conditions along this section are not potentially liquefiable or susceptible to lateral spreading.*

- Residence at 3425 97th Avenue SE (Sta. 97+08 to 99+37): *The soils along this section consist of 7 feet of loose to medium dense fill over stiff to very stiff glaciolacustrine deposits with groundwater at about 8 feet bgs. The soils and groundwater conditions along this section are not potentially liquefiable or susceptible to lateral spreading.*

- *I-90 Trail (Sta. 102+24 to 102+96): The gravity sewer will be shored and installed in limited lengths, and during construction the risk of landslides within the slope or neighboring properties is minimal and the site will remain safe. Because the project will be constructed in limited lengths and returned to the original grade and condition, the gravity sewer, when completed, will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties.*

- *NMPS: Based on an evaluation of site-specific subsurface conditions, the NME Project soils are primarily clays and are not susceptible to seismic-induced liquefaction or lateral spreading. Therefore, the proposed NME Project is not located in a seismic hazard area, per MICC 19.07.160(B)(3)(a).*

  *The stability of the existing slopes was evaluated as part of the design. The project plans and specifications require that all excavations be shored during construction to limit ground*

*movement, and the permanent project facilities were designed for the site-specific soils, groundwater, and slope conditions. Consequently, the NME Project has been designed so that the risk to the site and adjacent properties is mitigated such that the site is determined to be safe, per MICC 19.07.160(B)(3)(b).*

- *LS11: Based on an evaluation of site-specific subsurface conditions, the NME Project soils will consist of 5 to 7 feet of fill or very soft recessional lacustrine silts over medium dense to dense silt or very stiff to hard glaciolacustrine clays with groundwater at depths of 2 to 8 feet bgs. The valve vault and force main will be founded in medium dense silt or very stiff to hard clay, which are not susceptible to seismic-induced liquefaction or lateral spreading. Therefore, the proposed NME Project is not located in a seismic hazard area, per MICC 19.07.160(B)(3)(a).*

  *The project plans and specifications require that all excavations be shored during construction to limit ground movement, and the permanent project facilities are primarily below grade and will not adversely affect the existing condition of the site or neighboring properties. The new valve vault has a limited extent and will be shored and, therefore, the risk of landslides is minimal, particularly within a limited buffer zone. Based on the gradual grade of 97th Avenue SE and that the new force main will be installed perpendicular to the slope of the roadway, the risk of landslides within the roadway or neighboring properties is also minimal. Consequently, the NME Project construction and elements are so minor that they do not pose a threat to the public health, safety, and welfare, per MICC 19.07.160(B)(3)(d).*

*Note that this summary was also incorporated into the revised CCN (Section 4.2).*

**Mercer Island Comment:** Provide a statement of risk for work within the Shoreline Jurisdiction consistent with MICC (2017) 19.07.160(D)(2).

**This is a summary of the comment from Wood:** Similarly for Shorelands, to address MICC (2017) Section 19.07.160.D.2 requires the geotechnical professional provide a statement of risk. They should also confirm they have reviewed project plans, and that the planned development is consistent with their report recommendations.

***Response:*** *Attachment 2 is a memorandum that provides responses from Shannon & Wilson associated with construction within geologically hazardous areas. Areas within the NME Project that overlap with shorelands include LS11 and Mercer Island Boat Launch. Similar to the information presented above, the proposed construction methods will result in a minimal risk to existing geologically hazardous areas or adjacent properties within shorelands.*

*Note that this summary was also incorporated into the revised CCN (Section 4.2).*

**Mercer Island Comment:** Address the seasonal use criteria in MICC 19.07.160(F)(2).

**This is a summary of the comment from Wood:** The project duration is mentioned as April 2021 through December 2023. We did not notice any discussion of seasonal use restrictions per Section 19.07.160.F.2. A statement should be included regarding any additional mitigation required to preserve site stability. Any requirements as it pertains to erosion hazards and planned best management practices should also be addressed.

***Response:*** *The information related to construction during the wet season was addressed both in the Geotechnical Design Memorandum (Shannon & Wilson 2019), updated information by the geotechnical professional (Attachment 2), Section 5.11, and in the Seasonal Development Limitation Waiver application that is submitted as part of the construction permitting process (e.g., building and site development permits).*

*In general, the work proposed within each work areas on Mercer Island will consist of relatively shallow excavation and filling in limited lengths. Most of the excavation in the landslide hazard areas is either perpendicular to the slope or along the top of the slope, which reduces the risk of landsliding or slope instability. Consequently, the risk of landslides is not increased during wet season construction work. In conducting the work during the wet seasons, the geotechnical professional recommends that all excavations be shored to support the ground during construction, that an approved temporary erosion and sediment control plan be implemented, and that the Best Management Practices, as described in the GDM (Shannon & Wilson 2019), be followed during wet season construction.*

*Finally, based on the second pre-application meeting (September 11, 2019 – PRE19-042), and additional discussions with Don Cole (Mercer Island building official) and Patrick Yamashita (Mercer Island engineer), the only NME Project work areas that required a Seasonal Development Limitation Waiver included NMPS, LS11, and Mercer Island Boat Launch. The application information for the waivers in each of these areas is provided as Attachment 3.*

*Note that this summary was also incorporated into the revised CCN (Section 4.2).*

**Mercer Island Comment:** Add discussion of the potential for the planned construction through geologically hazardous areas to adversely affect existing structures, roads, utilities, and other facilities along the proposed alignment.

**This is a summary of the comment from Wood:** The geotechnical report needs to discuss the potential for the planned construction through geologic hazard areas to adversely affect existing structures, roads, utilities, and other facilities along the alignment. For example, we note that the planned sewer alignment will require excavation immediately adjacent to I-90 roadway and retaining walls (such as between Sta. 31+75 to Sta. 33+50, between Sta. 42+00 to 45+00). The pipeline trenching runs through landslide deposits along the north side of I-90 between Sta. 72+00 and Sta. 87+00. While the geotechnical report discusses temporary shoring methods that "could" or "should" be used, the means and methods are typically left open to the discretion of the contractor. While the Shannon & Wilson geotechnical memorandum and the Confluence Critical Areas report discuss settlement monitoring in conjunction with temporary dewatering activities, the reports need to address what if any instrumentation is required to monitor lateral deformations of adjacent facilities, and to establish threshold levels for taking action. If required, these items need to be included in the project bid documents. If not required, this needs to be acknowledged in the project risk statements.

***Response:*** *Attachment 2 is a memorandum that provides responses from Shannon & Wilson associated with construction within geologically hazardous areas. The geotechnical professional specifically addressed the risk on structures and facilities (pp. 12-13). In summary, most of the geologically hazard areas do not have structures located within a horizontal distance equal to 1.5 times the depth of excavation. The exception is the I-90 walls that parallel most of the pipeline alignment along the I-90 Trail. An analysis was conducted by the design team in 2019 to evaluate the impact of pipeline*

*construction on the adjacent WSDOT retaining walls on Mercer Island. Based on this analysis, none of the pipeline excavations were within the WSDOT foundation influence zone or passive zone and, therefore, the trench excavations should not adversely affect the walls.*

*While there are few structures located within a horizontal distance equal to 1.5 times the depth of excavation, there are many potentially sensitive utilities within that distance, including storm drains, sewers, and water mains that will require settlement monitoring or video surveys during construction. Instrumentation recommendations for monitoring sensitive utilities are provided in Section 6.0 of the GDM (Shannon & Wilson, 2019). Surface settlement points are recommended for monitoring:*

- *Curbs, sidewalks, and roadways;*
- *Utility settlement points on settlement-sensitive utilities such as water mains that cross above and/or parallel the pipe excavations;*
- *Video surveys on sewers and storm drains prior to and after construction to evaluate settlement or damage;*
- *Structure settlement points on selected WSDOT retaining walls; and*
- *Slope monitoring points along slopes in the landslide or steep slope hazard areas.*

*These monitoring points are included in the NME Project plans and specifications. In addition to the instrumentation locations, action or threshold levels were developed for each instrument type and are included in the project specifications.*

## CRITICAL AREAS STUDY

**ESA Comment:** ESA noticed that no fish exclusion measures were mentioned as BMPs for the Mercer Island Boat Launch or the East Channel sites. If WDFW requires this BMP during their review of the Hydraulic Project Approval (HPA) we recommend that these permit requirements be included in the CAS.

***Response:*** *The NME Project is working with WDFW and the National Marine Fisheries Service (NMFS) to identify appropriate fish exclusion measures. Where fish handling will potentially be required, the NME Project will use the recommended USFWS (2012) guidance. This include the NMPS stream. For the East Channel work, including the Mercer Island Boat Launch, isolation and fish exclusion will be established in a way that will discourage fish presence. For example, the mobile turbidity curtains used to control water quality conditions are folded in half and expanded slowly throughout the work area to naturally exclude fish. It is also notable that the in-work will be done during the standard work window to avoid Endangered Species Act listed salmonids.*

*A note about use of the USFWS (2012) guidance for fish exclusion, where relevant, was added to the CAS (Section 4.3).*

**Mercer Island Comment:** Revise the CAS to be consistent with the impervious surface calculations shown in the memo titled *North Mercer Island Interceptor and Enatai Interceptor Upgrade Project – Fruitland Landing Park (Lift Station 11) Update for Shoreline Permitting* dated November 6, 2019.

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**This is a summary of the comment from ESA:** ESA believes that NME Project meets the recommendations of the City's current SMP (MICC 19.07.110) with the exception of the calculation of impervious surface at the Fruitland Landing Park site. There are several inconsistencies when comparing the calculations of impervious surface in the CAS (Table 10) with the calculations of impervious surface in the Shoreline Permitting Memo (Table 1 and 2). For example, the total existing impervious surface within 25 feet and 50 feet of the OHWM in the CAS Table 10 is 261 SF and 450 SF, respectively. However, in Table 1 and Table 2 in the Shoreline Permitting Memo, the existing area of impervious surface within 25 feet and 50 feet are 184 SF and 453 SF, respectively. Additionally, the proposed impervious surface in the CAS Table 10 is 337 SF within 25 feet of the OHWM and 771 SF within 50 feet of the OHWM. However, the current proposed impervious surface areas in Table 1 and 2 of the Shoreline Permitting Memo 300 SF within 25 feet of the OHWM and 760 SF within 50 feet of the OHWM. ESA recommends that the CAS and/or the Shoreline Permitting Memo be revised to be consistent in the amount of existing and proposed impervious surface.

***Response:*** *The impervious surface (**note:** this is also relevant to hard surface) values provided in the Shoreline Permitting Memorandum (dated November 6, 2019) have been reviewed against the final site layout and updated, as presented in the revised CAS Table 10 below. These values have also been updated in the supporting exhibits for the existing and new layouts of the hard surface areas (Attachment 3). The revised Table 10 shows a site reduction in impervious surface area within the 0- to 25-foot buffer, 25-foot to 50-foot buffer, and beyond 50-foot buffer. There is an overall reduction of 3% in impervious surface area within the Fruitland Landing Park work area.*

**Revised CAS Table 10. Impervious (Hard) Surface Area within Fruitland Landing Park**

| | Within 25 feet of OHWM | Within 25 feet to 50 feet of OHWM | Beyond 50 feet of OHWM | Total |
|---|---|---|---|---|
| Existing Impervious Surface Area (SF) | 185 | 449 | 1,228 | 1,862 |
| Proposed Impervious Surface Area (SF) | 167 | 405 | 1,130 | 1,702 |
| Change in Impervious Surface Area (SF) | -18 | -44 | -98 | -160 |
| Total Area (includes vegetated area) (SF) | 680 | 964 | 4,403 | 6,047 |
| **% Total Impervious Surface Area** | **25%** | **42%** | **26%** | **28%** |
| **% Change in Total Impervious Surface Area** | **-3%** | **-5%** | **-2%** | **-3%** |

OHWM = ordinary high water mark; SF = square feet

*The revised CAS Table 10 is also provided in the CAS itself. In reviewing Section A of the Mercer Island 'small projects stormwater Site Plan/Report' (http://www.mercergov.org/files/MercerIsland_Sections_A-D.pdf), the site and new works answer yes to all the criteria with the exception of criteria 3. As noted in Attachment 3 and revised CAS Table 10, the works are less than the 2,000 SF minimum for new plus replaced impervious surfaces, with a land disturbing area less than 7,000 SF with an overall site reduction in impervious surface area.*

**City Comment:** Provide a figure graphically showing which portions of the site would be pervious landscape and which would be grass.

**This is a summary of the comment from ESA:** The revised design at LS11 (Fruitland Park) achieves a net reduction in impervious surface primarily due to the addition of pervious landscape/grass. However, the Shoreline Permitting Memo does not detail what portions of the site would be pervious landscape (i.e., permeable pavement) and what portions of the site would be grass. ESA recommends that the figure that accompanies the Shoreline Permitting Memo be revised to include these details.

***Response:*** *All pervious surfaces being replaced within Fruitland Landing Park will be either grass or planting beds with new imported topsoil and mulch under the vegetated areas. No pervious pavers will be used on the site. This will be corrected in the CAS. Please refer to Attachment 3 for a graphical representation of these changes.*

**Mercer Island Comment:** Provide details on the type of pervious surface proposed for the improvements at LS-11, demonstrating how the definition of "impervious surface" in the City's code is or is not met.

**This is a summary of the comment from ESA:** The Shoreline Permitting Memo does not provide details on what type of pervious surfaces would be used in the project improvements at LS-11 (Fruitland Park). According to MICC 19.16.010.I(5), impervious surfaces include any "structure or hard surface which either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development, or causes water to run off the surface in greater quantities or at an increased rate of flow from present flow rate under natural conditions prior to development." ESA recommends that the CAS and Shoreline Permitting Memo be revised to include additional detail on the type of pervious materials that are proposed, and how they do or do not meet the definition above.

***Response:*** *See response above. All of the proposed surfaces added by the NME Project meet the definition of pervious. Please refer to Attachment 3 for a graphical representation of these changes.*

**ESA Comment:** If the NME Project proposes the use of pervious surfaces, ESA recommends that the project design follows recommendations in the King County 2016 Surface Water Design Manual – Simplified Drainage Requirements (Appendix C). Specifically, Section C.2.7 puts forth design specifications for several types of permeable pavement and recommends that a soil analysis and infiltration testing occur before installation to demonstrate that permeable pavement would be effective in reducing runoff. The manual also gives maintenance instructions for permeable pavement as regular inspection and maintenance is necessary to ensure the surface is infiltrating properly.

***Response:*** *See responses above. Please refer to Attachment 3 for a graphical representation of these changes.*

## ADDITIONAL UPDATES

As the design has progressed beyond 60%, there have been updates incorporated into the NME Project on Mercer Island. In addition, there were changes to the materials discussed in the land use application package. Notable updates in the revised documents included in this response to comments package include:

- Updates to the landscape restoration and tree planting at NMPS (PLAN Sheets Volume 1: L101 and L102), LS11 (PLAN Sheets Volume 1: L601 and L602), and Mercer Island Boat Launch (PLAN Sheets Volume 2: C132 to C134).
- Updates to the storm drainage plan at NMPS, which is in-line with the current post-90% design (PLAN Sheet Volume 1: C124 and C125).
- Updates to the piped stream location and associated buffer at Fruitland Landing Park, which was relocated by Mercer Island in 2019. This also included removal of a tree on the pipe alignment (PLAN Sheets Volume 1: D603, C601, C602, C603, and C605).
  **Note:** not all sheets were updated with this change if it was not relevant to the information on the sheet, but the original note was left related to how the piped stream location was relocated by Mercer Island.
- Better information on the existing impervious surface along the I-90 Trail, which led to a more accurate calculations of added impervious surface area from the NME Project. Due to the presence of 2 feet of gravel along each edge of the trail, the expansion of the trail will only result in an additional 6,140 SF of impervious surface compared to the original estimate of 20,160 SF. This change will be more thoroughly detailed in the drainage report submitted with the site development permit for the NME Project conveyance. Also note that these changes are all outside of critical areas or shorelands.
- Updates to the Temporary Erosion and Sediment Control measures were added along the I-90 Trail and moving down into Mercer Island Boat Launch (PLAN Sheets Volume 2: C230, C231, and C232).
- Updates in the design also led to increases in temporary impacts (+8,080 SF) and decreases in permanent impacts via reduced impervious surface areas (-520 SF) within critical areas and shorelands compared to the original CAS.
- Updates to the enhancement designs and calculations were provided in the CAS. During review of the materials for the land use application, it was identified that some of the enhancements were over calculated, but still higher than the proposed impacts within critical areas and shorelands.
- Updates will be made to the Tree Management Plan, but it was determined that these would be provided during the construction permit process (i.e., building permit, site development permits) associated with the Tree Permit application process. This decision was in coordination with requested information by John Kenney (Mercer Island arborist), and resulted in removing the draft Tree Management Plan from the land use application materials.

## SUMMARY

Overall, the comments from Mercer Island and outside reviewers, and resulting updates to the NME Project documents, did not change the overall conclusions in the land use application materials. The impacts are still primarily temporary (95%), and both site restoration and ecological enhancements will result in a no-net-loss of critical area and shoreland functions on Mercer Island. In addition, there were a few updates from the responses and changes in the design that resulted in a reduction of the potential permanent impacts. The main changes that resulted in a reduction of permanent impacts within critical areas and shorelands included:

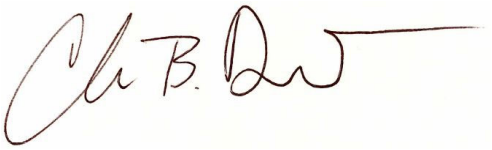
King County

- A 360 SF reduction in permanent impacts within the NMPS stream buffer.
- A 160 SF reduction in impervious surface area within the shoreland at Fruitland Landing Park.

These changes, along with additional improvements at Fruitland Landing Park, resulted in an overall change in impacts (158,370 SF) compared to site restoration and ecological enhancements (169,000 SF). The NME Project will continue to work to reduce the overall impacts during construction.

If you have any questions, please contact me at 206-477-5458, or email me at chris.dew@kingcounty.gov.

Sincerely,

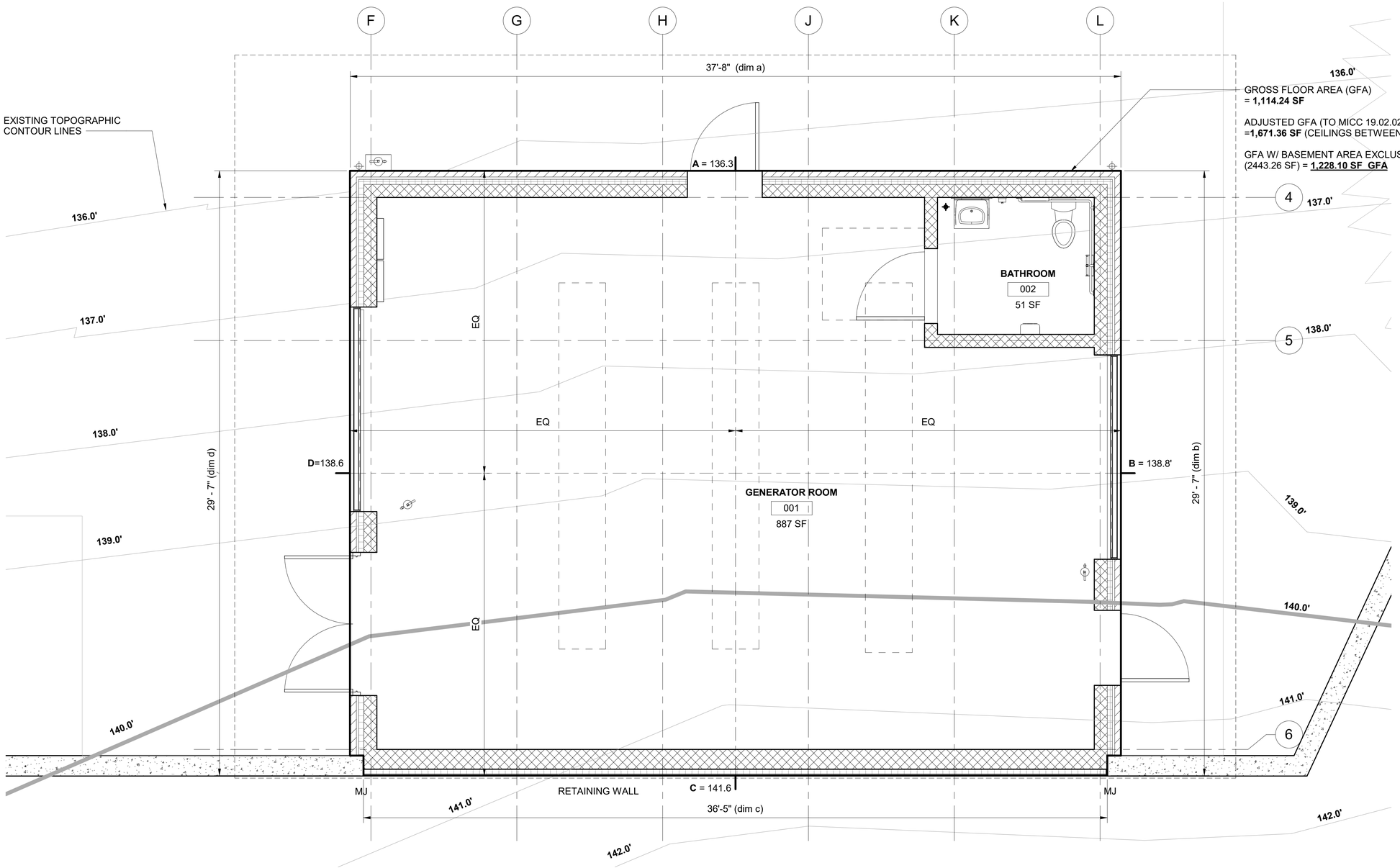


Christopher Dew

Water Quality Planner/Project Manager

Enclosure(s): revised versions of the Critical Areas Study (CAS), Project Narrative (PN), Code Compliance Narrative (CCN), and Development Plan Set (PLAN)

# Attachment 1: North Mercer Pump Station Gross Floor Area and Lot Slope Calculations




GROSS FLOOR AREA (GFA)
= **1,114.24 SF**

ADJUSTED GFA (TO MICC 19.02.020(D)(2)(a))
=**1,671.36 SF** (CEILINGS BETWEEN 12' & 16')

GFA W/ BASEMENT AREA EXCLUSION
(2443.26 SF) = **1,228.10 SF GFA**

## AVERAGE BUILDING ELEVATION CALCULATIONS:

GENERATOR BUILDING

| MIDPOINT ELEVATION | RECTANGLE SEGMENT LENGTH |
|---|---|
| A = 136.3 | a = 37' - 8" |
| B = 138.8 | b = 29' - 7" |
| C = 141.6 | c = 36' - 4" |
| D = 138.6 | d = 29' - 7" |

$$\frac{Aa+Bb+Cc+Dd}{a+b+c+d} = ABE$$

$$\frac{136.30(37.66)+138.80(29.58)+141.60(37.33)+138.6(29.58)}{37.66+29.58+36.33+29.58}$$

=138.81'

## GROSS FLOOR AREA CALCULATIONS:

GENERATOR BUILDING

| WALL SEGMENT LEGNTH | COVERAGE |
|---|---|
| A = 37' - 8" | 0% |
| B = 29' - 7" | 0% |
| C = 36' - 4" | 73% |
| D = 29' - 7" | 0% |

ACTUAL GROSS FLOOR AREA (GFA)
= 1,114.24 SF

ADJUSTED GFA (TO MICC 19.02.020(D)(2)(a))
= 1,671.36 SF

BASEMENT EXCLUSION
1,671.36 SF X (A%+B%+C%+D%)
= 443.26 SF

GFA W/ BASEMENT EXCLUSION
1,671.36 - 443.26
= **1,228.10 SF**




| NO | REVISION DESCRIPTION | BY | APVD | DATE |
|---|---|---|---|---|

TETRA TECH
JACOBS®

| | |
|---|---|
| DESIGNED/DRAWN: Author | SCALE: As indicated |
| PROJECT ENGINEER: Designer | REFERENCE 0 1 |
| DESIGN APROVAL: Checker | FACILITY NUMBER: 333 |
| PROJECT ACCEPTANCE: Approver | CONTRACT NO: C01339C20 |

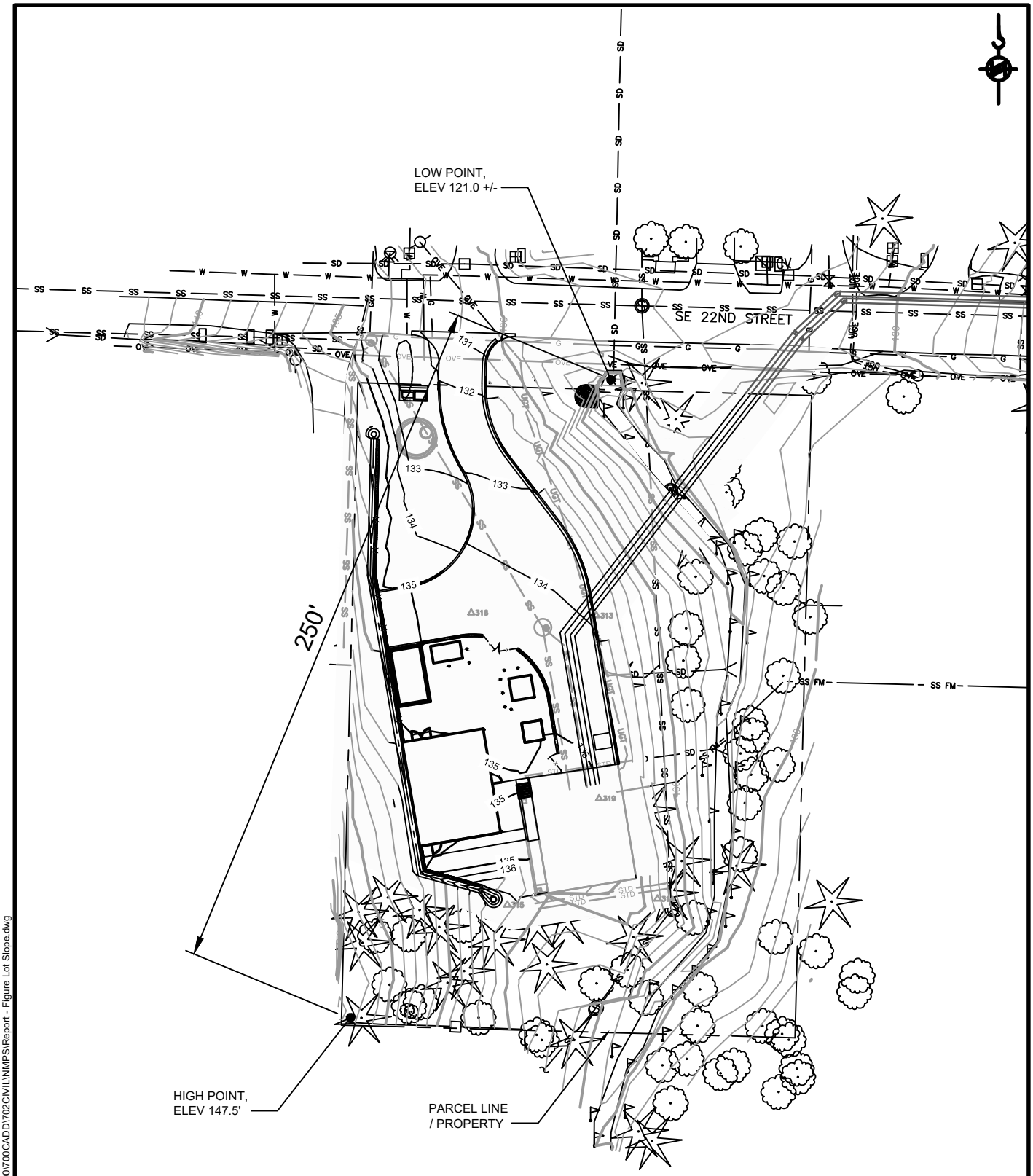
King County

DEPARTMENT OF NATURAL RESOURCES & PARKS
WASTEWATER TREATMENT DIVISION
NORTH MERCER ISLAND INTERCEPTOR AND ENATAI INTERCEPTOR UPGRADE – PUMP STATION IMPROVEMENTS

# GENERATOR BUILDING - FLOOR PLAN - ABE & GFA CALCULATIONS

DCN:
DATE: 12/16/2019
PROJECT FILE NO:
DRAWING NO:
SHT NO / TOTAL: /
REV NO:

BORDER FILE: KCWTD-2017-Dsize-TB-Border
FILE LOCATION: BIM 360://North Mercer Pump Station/333-E00306E13-PS-A-2019.rvt
PLOT DATE: 2/19/2020 5:08:41 PM
PLOTTED BY: REVIT




FILE LOCATION:P:\W3X67200\700CADD\702CIVIL\NMPSIReport - Figure Lot Slope.dwg

1 ALLIANCE GEOMATICS SURVEYING & MAPPING

LOT MAP, DEVELOPED CONDITIONS

SCALE: 1"=50'

0 REFERENCE 1"

| | | | |
|---|---|---|---|
| JACOBS | NORTH MERCER ISLAND PUMP STATION IMPROVEMENTS | **LOT SLOPE INFO** | FIGURE - |

# Attachment 2:
# Additional Geotechnical Information

SHANNON & WILSON
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

March 6, 2020

Ms. Grizelda Sarria
Tetra Tech, Inc.
1420 Fifth Avenue, Suite 600
Seattle, WA 98101

RE: SUPPLEMENTAL GEOTECHNICAL LETTER REPORT, GEOLOGICALLY HAZARDOUS AREAS ALONG THE CONVEYANCE ALIGNMENT, NORTH MERCER ISLAND INTERCEPTOR AND ENATAI INTERCEPTOR UPGRADE PROJECT, MERCER ISLAND, WASHINGTON

Dear Ms. Sarria:

In accordance with your request, we have prepared this supplemental geotechnical letter report in support of comments received on the Mercer Island land use permit application. We were provided a copy of the January 2020 comments prepared by Mercer Island review staff and Wood Environmental & Infrastructure Solutions, Inc. as part of this document preparation. The comments pertain primarily to items related to geologically hazardous areas along the conveyance alignment on Mercer Island. This letter report should be reviewed in conjunction with our Geotechnical Design Memorandum (Shannon & Wilson, 2019).

According to the Mercer Island geographic information system (2019), there are landslide and seismic hazards along the conveyance alignment. We have identified six sections of the conveyance alignment that are within landslide hazard areas and six sections that are within seismic hazard areas. In addition, the North Mercer Pump Station and Lift Station No. 11 are located within landslide and/or seismic hazard areas. These sites are discussed in separate letters (Shannon & Wilson, 2020).

## LANDSLIDE HAZARD AREAS

As discussed above, there are six sections of the conveyance alignment that are within designated landslide hazard areas. These sections include Station (Sta.) 1+64 to 5+50, Sta. 71+75 to 73+11, Sta. 74+62 to 78+05, Sta. 81+23 to 82+35, Sta. 89+87 to 90+30, and Sta. 102+24 to 102+96. The locations of these sections are shown in Figure 1.

## SE 22nd Street (Station [Sta.] 1+64 to 5+50)

The pipeline between Sta. 1+64 and 5+50 is located within a designated landslide hazard area. This section of pipeline will consist of dual force mains installed within the right-of-way of SE 22nd Street to depths of 8 to 12 feet below ground surface (bgs). The existing grade of SE 22nd Street along this section ranges from relatively flat near Sta. 1+64 to about 11% near Sta. 5+50. The soils along this section of the alignment consist of about 7 feet of medium dense fill over stiff to very stiff clay. Groundwater is about 7.5 feet bgs.

We anticipate the force mains will be installed using conventional open-cut construction methods with temporary shoring consisting of trench boxes. We also anticipate that the construction will be conducted in limited lengths of 50 feet or less and that the force mains will be backfilled and compacted back to the original grade and surface conditions (paved).

### Minimum Risk Statement

Based on the gradual grade of SE 22nd Street, that the new force mains will be installed perpendicular to the slope of the roadway, and that that the construction will be conducted in limited lengths, it is my opinion that during construction the risk of landslides within the roadway or neighboring properties is minimal and that the site will remain safe. Because the project will be constructed in limited lengths and returned to the original grade and condition, it is also my opinion that the force mains, when completed, will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties.

## 90th Place SE (Sta. 71+75 to 73+11)

The pipeline between Sta. 71+75 and 73+11 is located within a designated steep slope hazard area. This section of pipeline will consist of a gravity sewer installed to depths of 12 to 16 feet bgs within the right-of-way of 90th Place SE and perpendicular to a steep slope within the Washington State Department of Transportation (WSDOT) right-of-way. The soils along this section consist of dense to very dense till and till-like deposits. Groundwater is about 11 feet bgs.

We anticipate the gravity sewer will be installed using conventional open-cut construction methods with temporary shoring consisting of trench boxes. We also anticipate that the construction will be conducted in limited lengths of 50 feet or less and that the gravity sewer will be backfilled and compacted back to the original grade and disturbed areas above the sewer will be landscaped or paved in accordance with the project plans and specifications.

### Minimum Risk Statement

The dense to very dense till and till-like soils encountered at the site have high shear strength and are not susceptible to landslide activity. Consequently, in my opinion, the site is not located in a landslide hazard. However, due to the steepness of the grade in this area, trench dams were recommended to prevent groundwater migration and erosion of the backfill soils. Based on my review of the plans and specifications, the trench drains have been included in the design.

## Interstate 90 (I-90) Trail (Sta. 74+62 to 78+05)

The pipeline between Sta. 74+62 and 78+05 is located within a designated landslide hazard area. This section of pipeline will consist of a gravity sewer installed to a depth of 8 feet bgs along the top of an existing slope within the I-90 Trail. The soils along this section consist of about 8 feet of loose to very dense fill over very soft to stiff landslide debris. Based on the boring conducted within this section, groundwater is more than 21.5 feet bgs.

Existing information from WSDOT indicates older landslides occurred to the south of I-90 and that the toe of these slides is located about 100 feet south of the proposed alignment. In my opinion, it is likely that the landslide debris encountered in this section is old landslide debris used as fill to raise the roadway grade. The topography around the landslide has since been altered to a degree that would not suggest the same landslide susceptibility as was present at the time of the landslide. There is currently no evidence that landslides have occurred in this area post-I-90 construction.

We anticipate the gravity sewer will be installed using conventional open-cut construction methods with temporary shoring consisting of trench boxes. We also anticipate that the construction will be conducted in limited lengths of 50 feet or less and that the gravity sewer will be backfilled and compacted back to the original grade and surface conditions (paved trail).

### Minimum Risk Statement

Since the gravity sewer will be installed along the top of the existing slope in limited lengths, it is my opinion that during construction the slope will be temporarily unloaded, which reduces the risk of landslide activity along the trail and to neighboring properties. In addition, because the final installed pipeline will weigh the same or less than the current condition, it is also my opinion that the gravity sewer through this section, when completed,

will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties.

## I-90 Trail (Sta. 81+23 to 82+35)

The pipeline between Sta. 81+23 and 82+35 is located within a designated landslide hazard area. This section of pipeline will consist of a gravity sewer installed to a depth of 17 feet bgs within and adjacent to the I-90 Trail. The soils along this section consist of about 19 feet of very loose to loose landslide debris over dense recessional outwash deposits and very stiff glaciolacustrine deposits. Groundwater varies depending on season from 12 to 18 feet bgs.

As discussed above for the pipeline from Sta. 74+62 to 78+05, it is our opinion that the landslide debris encountered in this section is old landslide debris used as fill to raise the I-90 roadway grade and that the topography around the landslide has since been altered to a degree that would not suggest the same landslide susceptibility as was present at the time of the landslide. The site along this section is relatively flat and there is currently no evidence that landslides have occurred in this area since the I-90 construction. Based on the site and the lack of existing slopes in the area, it appears that this section was designated as a landslide hazard based on the existence of landslide debris and not potential slope instability.

We anticipate the gravity sewer will be installed using conventional open-cut construction methods with temporary shoring consisting of slide-rail shoring systems or similar. We also anticipate that the construction will be conducted in limited lengths of 50 feet or less and that the gravity sewer will be backfilled and compacted back to the original grade and surface conditions (paved trail and landscaping).

### Minimum Risk Statement

Since the site is relatively flat with no nearby slopes, it is my opinion that the construction of the gravity sewer in this section is so minor that it does not pose a threat to the public health, safety and welfare.

## SE 35th Street (Sta. 89+87 to 90+30)

The pipeline between Sta. 89+87 and 90+30 is located within a designated landslide hazard area. This section of pipeline will consist of a gravity sewer installed to a depth of 20 feet bgs along the top of an existing slope within the right-of-way of SE 35th Street. The soils

along this section consist of dense to very dense fill with groundwater deeper than 25 feet bgs.

We anticipate the gravity sewer will be installed using conventional open-cut construction methods with temporary shoring consisting of slide-rail shoring systems or similar. We also anticipate that the construction will be conducted in limited lengths of 50 feet or less and that the gravity sewer will be backfilled and compacted back to the original grade and condition (paved).

### Minimum Risk Statement

Since the gravity sewer will be installed along the top of the existing slope in limited lengths, it is my opinion that during construction the slope will be temporarily unloaded, which reduces the risk of landslide activity along the roadway and to neighboring properties. In addition, because the final installed pipeline will weigh the same or less than the current condition, it is also my opinion that the gravity sewer through this section, when completed, will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties.

## I-90 Trail (Sta. 102+24 to 102+96)

The pipeline between Sta. 102+24 to 102+96 is located within an identified landslide, steep slope hazard area. This section of pipeline will consist of a gravity sewer installed to a depth of about 10 to 14 feet bgs within a steep slope in the WSDOT right-of-way. The soils along this section consist of about 8 feet of loose to medium dense fill over about 14 feet of loose to medium dense recessional outwash with groundwater at a depth of 15 feet bgs.

We anticipate the gravity sewer will be installed using conventional open-cut construction methods with temporary shoring consisting of trench boxes. Due to the steepness of the slope, we also anticipate that the construction will be conducted in very limited lengths of 30 feet or less and that the gravity sewer will be backfilled and compacted back to the original grade and condition (landscaped).

### Minimum Risk Statement

Since the gravity sewer will be shored and installed in limited lengths, it is my opinion that during construction the risk of landslides within the slope or neighboring properties is minimal and that the site will remain safe. Because the project will be constructed in limited lengths and returned to the original grade and condition, it is also my opinion that the

gravity sewer, when completed, will be as safe as if it were not located in a geologically hazardous area and will not adversely impact adjacent properties.

## SEISMIC HAZARD AREAS

As discussed earlier, in addition to landslide hazard areas, there are six sections of the alignment that are within seismic hazard areas, including Sta. 1+64 to 5+50, Sta. 19+20 to 24+58, Sta. 25+60 to 29+40, Sta. 61+32 to 61+67, Sta. 88+80 to 90+30, and Sta. 97+08 to 99+37. The locations of these sections are shown in Figure 1.

### SE 22nd Street (Sta. 1+64 to 5+50)

The pipeline between Sta. 1+64 and 5+50 is located within a designated seismic hazard area. This section of pipeline will consist of dual force mains installed within the right-of-way of SE 22nd Street to depths of 8 to 12 feet bgs. The soils along this section of the alignment consist of about 7 feet of medium dense fill over stiff to very stiff clay. Groundwater is about 7.5 feet bgs.

Based on the project plans, the force mains will be founded in stiff to very stiff clay. Based on our analysis, these soils are not susceptible to seismic hazards, including liquefaction or lateral spreading.

#### Minimum Risk Statement

Since the force mains are founded in soils that are not susceptible to liquefaction or lateral spreading, it is my opinion that the proposed force mains are not located in a seismic hazard area.

### SE 24th Street (Sta. 19+20 to 24+58)

The pipeline between Sta. 19+20 and 24+58 is located within a designated seismic hazard area. This section of pipeline will consist of dual force mains installed within the right-of-way of SE 24th Street to depths of 5 to 12 feet bgs. The soils along SE 24th Street consist of about 5 feet of medium dense fill over about 7 feet of stiff silts and clays (recessional lacustrine deposits), and groundwater was not encountered. Based on our analysis, the subsurface soil and groundwater conditions along this section is not potentially liquefiable or susceptible to lateral spreading.

### Minimum Risk Statement

Since the force mains are founded in soils that are not susceptible to liquefaction or lateral spreading, it is my opinion that the proposed force mains along this section of the alignment are not located in a seismic hazard area.

## 81st Avenue SE (Sta. 25+60 to 29+40)

The pipeline between Sta. 25+60 and 29+40 is located within a designated seismic hazard area. This section of pipeline will consist of dual force mains installed within the right-of-way of 81st Avenue SE to depths of 5 to 12 feet bgs. The soils along 81st Avenue SE consist of very dense or hard silts and clays (glaciolacustrine deposits), and groundwater was encountered at a depth of 35 feet bgs. Based on our analysis, the soil and groundwater conditions along this section is not potentially liquefiable or susceptible to lateral spreading.

### Minimum Risk Statement

Since the force mains are founded in soils that are not susceptible to liquefaction or lateral spreading, it is my opinion that the proposed force mains along this section of the alignment are not located in a seismic hazard area.

## Shorewood Drive (Sta. 61+32 to 61+67)

The pipeline between Sta. 61+32 to 61+67 is located within an identified seismic hazard area. This section of pipeline will consist of dual force mains installed within the right-of-way of Shorewood Drive to a depth of about 10 feet bgs. The soils along this section consist of about 17 feet of medium dense to very dense fill over about 5 feet of loose recessional outwash with groundwater at a depth of about 17 feet bgs. Based on our analysis, these soils are potentially liquefiable but not susceptible to lateral spreading. Our analysis indicates that liquefaction-induced settlements of 2 to 2.5 inches may occur in this area. The force mains through this section have been designed to accommodate the potential settlement.

### Minimum Risk Statement

Since the force mains can accommodate the potential liquefaction-induced settlement, it is my opinion that the proposed force mains are designed so that the risk to the site and adjacent property is eliminated or mitigated such that the site is determined to be safe.

## SE 35th Street (Sta. 88+80 to 90+30)

The pipeline between Sta. 88+80 and 90+30 is located within a seismic hazard area. This section of pipeline will consist of a gravity sewer installed within the right-of-way of SE 35th Street to a depth of 25 feet bgs. The soils along SE 35th Street consist of 12 feet of dense to very dense fill over very dense, glacially overridden advance outwash deposits. Groundwater is deeper than 25 feet along this section. Based on our analysis, the soils and groundwater conditions along this section are not potentially liquefiable or susceptible to lateral spreading.

### Minimum Risk Statement

Since the gravity sewer is founded in soils that are not susceptible to liquefaction or lateral spreading, it is my opinion that the proposed gravity sewer along this section of the alignment is not located in a seismic hazard area.

## Residence at 3425 97th Avenue SE (Sta. 97+08 to 99+37)

The pipeline between Sta. 97+08 and 99+37 is located within a designated seismic hazard area. This section of pipeline will consist of a gravity sewer primarily installed on private property at 3425 97th Avenue SE to a depth of about 8 feet bgs. The soils along this section consist of 7 feet of loose to medium dense fill over stiff to very stiff glaciolacustrine deposits with groundwater at about 8 feet bgs. Based on our analysis, the soils and groundwater conditions along this section are not potentially liquefiable or susceptible to lateral spreading.

### Minimum Risk Statement

Since the gravity sewer is founded in soils that are not susceptible to liquefaction or lateral spreading, it is my opinion that the proposed gravity sewer along this section of the alignment is not located in a seismic hazard area.

## MERCER ISLAND BOAT LAUNCH

The pipeline within the Mercer Island Boat Launch site (Sta. 207+00 and 210+40) is located within a designated steep slope hazard area. The pipeline will consist of a triple-barrel siphon installed within the WSDOT right-of-way. The depth of the triple-barrel siphon will range from about 6 to 12 feet bgs. The existing grade of the site varies from about 10% between Sta. 207+00 and 210+00 to 46% between Sta. 210+00 and 210+40. The soils in the flatter area of the site (Sta. 207+00 and 210+00) consist of about 12 feet of loose to medium

dense fill over very dense silt and sand. For the steep slope area (Sta. 210+00 and 210+40), the soils consist of about 11 feet of glacially overridden, very dense, sandy silt over hard, silty clay. Groundwater levels vary from about 2 feet bgs near the lake to 21 feet bgs further upslope.

We anticipate the triple-barrel siphon will be installed using conventional open-cut construction methods with temporary shoring consisting of trench boxes. We also anticipate that the construction of the triple-barrel siphon will be conducted mostly perpendicular to the steep slopes in limited lengths of 30 feet or less and that the siphon pipeline will be backfilled and compacted back to the original grade and surface conditions (landscaped).

### Minimum Risk Statement

The very dense, sandy silt and hard, silty clay soils encountered in the steep slope at the site have high shear strength and are not susceptible to landslide activity or slope instability. Because the triple-barrel siphon will be installed mostly perpendicular to the steep slope and the construction will be conducted in limited lengths, it is my opinion that during construction the risk of landslides within the steep slope is minimal and that the site will remain safe. Because the triple-barrel siphon will be constructed in limited lengths and returned to the original grade and condition, it is also my opinion that the pipeline, when completed, will be as safe as if it were not located in a steep slope hazardous area and will not adversely impact the slope or adjacent properties.

## SEASONAL DEVELOPMENT LIMITATIONS

The City of Mercer Island city code 19.07.160.F.2 restricts work including clearing, grading, filling, and foundation work within a landslide hazard area during the wet season, defined as October 1 to April 1, unless a waiver is granted. The planned work within the landslide hazard areas, as described herein, will require clearing, grading, excavation, foundation preparation, and fill placement during multiple wet seasons from 2021 to 2023. Consequently, seasonal development limitation waivers will be required for work between October 1 and April 1 in each year.

In general, the work at each site will consist of relatively shallow excavation and filling in limited lengths and most of the excavation in the landslide hazard areas is either perpendicular to the slope or along the top of the slope, which reduces the risk of landsliding or slope instability. Consequently, in my opinion the risk of landslides is not increased during wet season construction work. In conducting the work during the wet

seasons, we recommend that all excavations be shored to support the ground during construction, that an approved temporary erosion and sediment control plan be implemented, and that the Best Management Practices, as described in the Geotechnical Design Memorandum (Shannon & Wilson, 2019), be followed during wet season construction. Provided that these recommendations are followed, it is my opinion that no safety problems, environmental harm or adverse environmental impacts to the slopes or neighboring properties will occur by allowing clearing, grading, excavation, and fill activities to occur during the wet seasons.

## POTENTIAL AFFECTS ON STRUCTURES AND FACILITIES

Ground movements and settlement could result from lateral deformation of temporary shoring systems and could impact adjacent structures, improvements, utilities, pavements, and facilities. These deformations and potential affects were evaluated during the design and are discussed in detail in Section 5.9 of the Geotechnical Design Memorandum (Shannon & Wilson, 2019). In general, deformation and settlement can occur within a horizontal distance equal to one to 1.5 times the depth of the excavation.

For most of the geologic hazard areas, there are no structures located within a horizontal distance equal to 1.5 times the depth of excavation. The exception is the I-90 walls which parallel most of the pipeline alignment. An analysis was conducted by the design team in 2019 to evaluate the impact of pipeline construction on the adjacent WSDOT retaining walls on Mercer Island. The analysis included compiling the as-built information for retaining walls and developing sections every 25 feet along the project corridor. The sections included the existing retaining walls, proposed pipeline trenches, and the wall foundation influence zone beneath the retaining wall footings. The wall foundation influence zone, as defined in the WSDOT Utility Manual, is the area below a 45-degree envelope from the bottom of any edge of a footing. Based on this analysis, none of the pipeline excavations were within the WSDOT foundation influence zone or passive zone and, therefore, the trench excavations should not adversely affect the walls.

Although there are few structures located within a horizontal distance equal to 1.5 times the depth of excavation, there are many potentially sensitive utilities within that distance. The potentially sensitive utilities include storm drains, sewers, and water mains that will require settlement monitoring or video surveys during construction. We evaluated utilities within a horizontal distance equal to 1.5 times the depth of excavation and provided instrumentation recommendations in Section 6.0 of the Geotechnical Design Memorandum (Shannon & Wilson, 2019). In general, we recommended surface settlement points for monitoring curbs,

sidewalks, and roadways; utility settlement points on settlement-sensitive utilities such as water mains that cross above and/or parallel the pipe excavations; video surveys on sewers and storm drains prior to and after construction to evaluate settlement or damage; structure settlement points on selected WSDOT retaining walls; and slope monitoring points along slopes in the landslide or steep slope hazard areas. These monitoring points have been included in the project plans and specifications. In addition to the instrumentation locations, action or threshold levels were developed for each instrument type and are included in the project specifications. We have reviewed the instrumentation plans and specifications and the documents are consistent with our recommendations in the Geotechnical Design Memorandum (Shannon & Wilson, 2019).

## PROJECT PLANS AND SPECIFICATIONS

We have reviewed the project plans and specifications for the geologically hazardous areas described herein. We reviewed the shoring, foundation preparation, earthwork, dewatering, erosion control, surface restoration, and instrumentation requirements in the design and they are consistent with recommendations made in our Geotechnical Design Memorandum (Shannon & Wilson, 2019).

We appreciate this opportunity to provide our services. Should you have any questions, or if additional information is required, please contact me at (206) 695-6856.

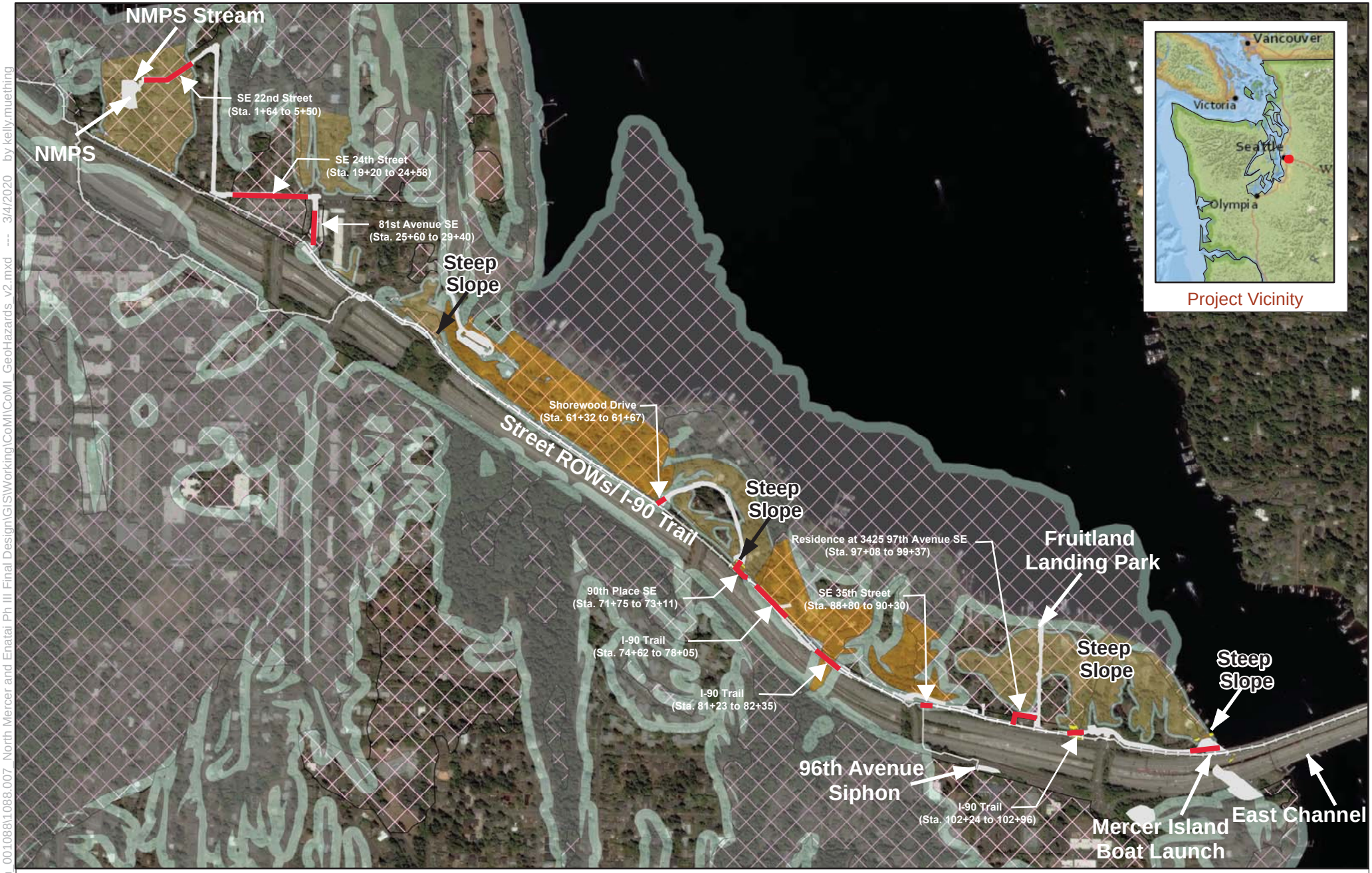
Sincerely,

SHANNON & WILSON


Michael S. Kucker, PE
Vice President

MSK/msk

Enc. Figure 1 – Geologic Hazard Areas




**Landslide Hazard Type**

- Deep
- Presumed Deep
- Shallow
- Landslide Hazard Buffer (width based on type)
- Steep Slope
- Steep Slope Buffer
- Seismic Hazard
- Limits of Construction
- I-90 Trail System

N

0 0.25 0.5 Miles

0 0.4 0.8 Kilometers

# FIGURE 1

CONFLUENCE ENVIRONMENTAL COMPANY

SHANNON & WILSON
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

March 5, 2020

Ms. Grizelda Sarria
Tetra Tech, Inc.
1420 Fifth Avenue, Suite 600
Seattle, WA 98101

RE: MINIMUM RISK STATEMENT, NORTH MERCER PUMP STATION UPGRADE, NORTH MERCER ISLAND INTERCEPTOR AND ENATAI INTERCEPTOR UPGRADE PROJECT, MERCER ISLAND, WASHINGTON

Dear Ms. Sarria:

In accordance with your request, we have prepared these minimal risk statements for the proposed upgrades to the North Mercer Pump Station (NMPS). We were provided a copy of the Intake Screening Comments prepared by Mercer Island review staff as part of this document preparation.

The upgrades to the existing NMPS will include a new generator building, BIOXIDE® storage tank, fuel storage tank, electric transformer, electric vault, odor control vessel, about 165 feet of dual force mains, and a temporary pump station to manage flows during construction. In addition to these facilities, the existing access roadway and parking area will be modified and expanded to improve vehicle access and turning, and will require new retaining walls that range from about 3 to 7 feet high along the west side of the site.

The proposed upgrades will primarily be constructed to the north and west of the existing pump station building. The west side of the property is currently undeveloped with a gentle slope of 5 Horizontal to 1 Vertical. In general, grading and excavations of up to about 8 feet deep will be required to install the new generator building, retaining walls, electric vault, odor control vessel, and parking area. The temporary pump station will require an excavation that is 35 feet deep. The BIOXIDE® storage tank, fuel storage tank, and electric transformer will be aboveground facilities and founded on slabs-on-grade.

Based on borings conducted for this project, the subsurface soil conditions consist of about 4 feet of fill over 5 to 8 feet of medium stiff to stiff clay. Underlying this layer is stiff to very stiff, hard clay to depths of greater than 50 feet. Groundwater was encountered on the site at depths of about 7 to 17 feet.

SHANNON & WILSON

According to the Mercer Island geographic information system (2019), the project site is in a shallow landslide and seismic hazard area. Slope movement and seismic induced liquefaction and lateral spreading were evaluated as part of the design and were implemented into the most current project plans and specifications. We have reviewed the most current plans and specifications and they are in conformance with the recommendations in our Geotechnical Design Memorandum (Shannon & Wilson, 2019).

Based on an evaluation of site-specific subsurface conditions, the project soils are primarily clays and are not susceptible to seismic-induced liquefaction or lateral spreading. Consequently, in my opinion and in accordance with Mercer Island City Code (MICC) 19.07.160(B)(3), the proposed project is not located in a seismic hazard area.

The stability of the existing slopes was evaluated as part of the design. The project plans and specifications require that all excavations be shored during construction to limit ground movement, and the permanent project facilities were designed for the site-specific soils, groundwater, and slope conditions. Consequently, in my opinion and in accordance with MICC 19.07.160(B)(3), the project has been designed so that the risk to the site and adjacent properties is mitigated such that the site is determined to be safe.

We appreciate this opportunity to provide our services. Should you have any questions, or if additional information is required, please contact me at (206) 695-6856.

Sincerely,

SHANNON & WILSON


Michael S. Kucker, PE
Vice President

MSK/msk

SHANNON & WILSON
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

March 5, 2020

Ms. Grizelda Sarria
Tetra Tech, Inc.
1420 Fifth Avenue, Suite 600
Seattle, WA 98101

RE: MINIMUM RISK STATEMENT, UPGRADE OF LIFT STATION 11 AT FRUITLAND LANDING, NORTH MERCER ISLAND INTERCEPTOR AND ENATAI INTERCEPTOR UPGRADE PROJECT, MERCER ISLAND, WASHINGTON

Dear Ms. Sarria:

In accordance with your request, we have prepared these minimal risk statements for the proposed upgrades to Lift Station 11 (LS 11) at the Fruitland Landing. We were provided a copy of the Intake Screening Comments prepared by Mercer Island review staff as part of this document preparation.

The upgrades to the existing LS 11 will include motor upsizing, modifications to the existing dry and wet wells, a new valve vault, concrete slab for the electrical cabinets, and electrical improvements. The new valve vault will be an approximately 8 feet wide by 14 feet long precast concrete vault founded approximately 11 feet below ground surface (bgs). The electrical cabinet slab will be approximately 6 feet wide by 12 feet long.

There is an existing 340 feet of 10-inch-diameter asbestos concrete force main along 97th Avenue SE that connects the regional wastewater system to LS 11 located between LS 11 and SE 34th Street. As part of the upgrade, the existing asbestos concrete force main will be rehabilitated using cured-in-place pipe methods and approximately 280 feet of new 10-inch-diameter ductile iron force main will be installed along 97th Avenue SE from SE 34th Street to the new interceptor near the Interstate 90 (I-90) Trail. The new pipe will be installed at a depth ranging from 5 to 10 feet bgs. All work for the force main extension will occur within the right-of-way of 97th Avenue SE.

The subsurface conditions at the new valve vault and concrete slab for the electrical cabinets at the Fruitland Landing site will consist of 7 feet of fill over medium dense silt and sandy silt to a depth of over 40 feet bgs. Groundwater is anticipated to be 2 feet bgs at this site.

For the new section of force main between SE 34th Street and the I-90 Trail, the subsurface conditions vary, with the north end near SE 34th Street consisting of about 5 feet of very soft

recessional lacustrine silts over very stiff to hard glaciolacustrine clays, and the south end near the I-90 Trail consisting of 7 feet of loose to medium dense fill over dense or very stiff glaciolacustrine silt and sandy silt. Groundwater is anticipated along the new section of force main at a depth of about 8 feet bgs.

According to the Mercer Island geographic information system (2019), the new valve vault and electrical cabinet slab are located within the buffers for shallow and deep landslide hazard areas, and a portion of the new force main is located within a shallow landslide hazard area. The entire project site, including 76th Avenue SE and the Fruitland Landing, are also within a seismic hazard area. Risks of slope movement and seismic-induced liquefaction and lateral spreading were evaluated as part of the design and were implemented into the most current project plans and specifications. We have reviewed the most current plans and specifications and they are in conformance with the recommendations in our Geotechnical Design Memorandum (Shannon & Wilson, 2019).

Based on an evaluation of site-specific subsurface conditions, the project soils consist of 5 to 7 feet of fill or very soft recessional lacustrine silts over medium dense to dense silt or very stiff to hard glaciolacustrine clays with groundwater at depths of 2 to 8 feet bgs. The valve vault and force main will be founded in medium dense silt or very stiff to hard clay, which are not susceptible to seismic-induced liquefaction or lateral spreading. Consequently, in my opinion and in accordance with Mercer Island City Code (MICC) 19.07.160(B)(3), the proposed project is not located in a seismic hazard area.

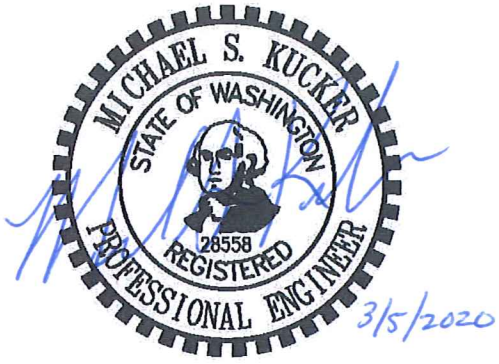
The stability of the project site was evaluated as part of the design. The project plans and specifications require that all excavations be shored during construction to limit ground movement, and the permanent project facilities are primarily below grade and will not adversely affect the existing condition of the site or neighboring properties. The new valve vault has a limited extent and will be shored and, therefore, the risk of landslides is minimal, particularly within a limited buffer zone. Based on the gradual grade of 97th Avenue SE and that the new force main will be installed perpendicular to the slope of the roadway, the risk of landslides within the roadway or neighboring properties is also minimal. Consequently, in my opinion and in accordance with MICC 19.07.160(B)(3), the project construction and elements are so minor that they do not to pose a threat to the public health, safety and welfare.

SHANNON & WILSON

We appreciate this opportunity to provide our services. Should you have any questions, or if additional information is required, please contact me at (206) 695-6856.

Sincerely,

SHANNON & WILSON




Michael S. Kucker, PE
Vice President

MSK/msk

# Attachment 3:
# Seasonal Development Limitation Waiver

King County
Department of Natural Resources and Parks
Wastewater Treatment Division
**Regulatory Compliance and Land Acquisition Services**
King Street Center, KSC-NR-0505
201 South Jackson Street
Seattle, WA 98104-3855

March 9, 2020

Don Cole, Building Official
City of Mercer Island
9611 SE 36th Street
Mercer Island, WA 98040

North Mercer Island Interceptor and Enatai Interceptor Upgrade Project – Seasonal Development Limitation Waiver Application Package: North Mercer Pump Station – Transmittal Letter

King County Wastewater Treatment Division (WTD) is applying for various environmental and construction permits from the City of Mercer Island (Mercer Island). King County WTD identified a need for capacity upgrades for the North Mercer Island and Enatai interceptors. The North Mercer Island Interceptor and Enatai Interceptor Upgrade Project (NME Project) proposes to construct a new pipeline from Mercer Island to Bellevue. The proposed pipeline route that is covered in this construction application package includes upgrades to the North Mercer Pump Station (NMPS), crossing the NMPS stream for the start of the new force main pipe. The purpose of the NME Project is to increase the reliability and capacity of the regional wastewater system that carries flows from the NMPS to the Eastside Interceptor in Bellevue.

During the second pre-application meeting with Mercer Island's Development Services Group on September 11, 2019 (PRE19-042), and through additional conversations, it was determined that the NME Project will submit an application for a Seasonal Development Limitation Waiver, but provide flexibility within the application to update the Building Official as project information becomes available. For example, as the contractor's detailed schedule is created, updates will be provided to Mercer Island to schedule site visits.

This application includes the required documents for a waiver, including:

- Geotechnical Report
- Working Drawings
- Construction Schedule
- Erosion Control Plan
- Emergency Procedures
- Emergency Contact Information

The following information is a description of the geologically hazardous areas within the NMPS work area, and the proposed measures to control erosion and sediments during the wet season (October 1 through April 1). This information is summarized from the more detailed *Geotechnical Design Memorandum* (Shannon & Wilson 2019), and amended as necessary. Also included in this information is a general construction schedule within each work area. Additional details on construction methods can be found in the *Project Narrative* by work area provided in the application materials for a building permit for the NME Project.

## NMPS Work Area

The existing NMPS (7631 SE 22nd Street, Parcel Number 531510-1945) was constructed around 1968 (Building Permit #68-254), and has not been significantly upgraded since construction. As part of the NME Project, NMPS will be upgraded to accommodate the increased flow and pumping head (pressure) that it will experience with the proposed pipeline improvements. Preventing nuisance odor impacts is also a major goal for the operation of the NME Project. The existing odor control system at the NMPS will be replaced with a more reliable carbon scrubber system. The carbon scrubber system, combined with the existing injection of inorganic salt solution into the wastewater at the NMPS, will control and treat odors at the pump station site and in the downstream pipelines.

A new building will be constructed to the west of the existing pump station structure. The new building will house a standby generator, electrical service equipment, and a restroom. A temporary pump station will be built to manage flows during construction. Exterior modifications will include relocation of the electrical transformer and an odor control chemical storage tank, and addition of a fuel tank and more odor control equipment. The access roadway and parking area will be modified and expanded to improve vehicle access and turning and will require new retaining walls along the west side of the site.

Other earthwork includes replacing the existing pipe that connects to the NMPS by installing new sewer pipes using conventional open cut-and-cover construction methods across the stream adjacent to NMPS. The NMPS stream is an unnamed stream that is a tributary to the Lake Washington watershed.

### Construction Schedule

NMPS and NMPS stream construction is expected to extend from April 2021 to December 2023 (Table 1). Activities within sensitive habitats are prioritized to occur for as short a period as possible. Site-specific restrictions will affect the timing and duration of construction activities. For example, construction timing will adhere to approved in-water fish work windows for the NMPS stream, as determined by the U.S. Army Corps of Engineers and Washington Department of Fish and Wildlife.

**Table 1. Construction Sequencing for the NME Project on Mercer Island**

| Work Area | Proposed Actions | Construction Sequencing | Duration (months) |
|---|---|---|---|
| NMPS | • Begins with initial mobilization.<br>• Ends with the NMPS facility upgrades completed. | • Apr 2021<br>• Dec 2023 | 33 |
| NMPS Stream | • Begins after initial mobilization.<br>• Ends when the open cut-and-cover work is complete across the NMPS stream. | • Jul 2022<br>• Aug 2022 | 2 |

NMPS = North Mercer Pump Station

Construction timing will need to be during the entire period from April 2021 through December 2023 in order to get NMPS operating. Therefore, work will need to occur during the wet season (October 1 to April 1) in all 3 years of construction.

## Soil Conditions and Groundwater

During the original construction in the 1960s, fill was placed to level the site. Based on existing information, up to 7 feet of medium dense fill, consisting of well-graded sand with silt, was placed across the site, with the thickest fill along the east side of the existing driveway. The existing influent sewer was constructed using pipe-jacking methods and a construction shaft was located in the existing parking area just north of the pump station. The size and shape of the shaft is not known. There is a geotechnical boring near the existing influent maintenance hole in the parking area (NME-7). Based on boring data (Shannon & Wilson 2019), the backfilled pipe-jacking construction shaft used to install the existing influent sewer appears to have been backfilled with poorly graded sand with silt and scattered wood and construction debris. Groundwater in the shaft backfill is about 8 feet below ground surface (bgs).

The subsurface soils where the new generator building, retaining walls, electrical and odor control facilities, and temporary pump station will be constructed consist of about 4 feet of fill over 5 to 8 feet of medium stiff to stiff clay. Underlying this layer is stiff to very stiff and hard clay to depths of greater than 50 feet bgs. Groundwater was encountered on the site at depths of about 7 to 17 feet bgs.

Based on the borings along the dual force main alignment on SE 22nd Street, the subsurface soils consist of about 7 feet of fill, consisting of soft clay with sand, over about 8 feet of medium stiff clay. Underlying the medium stiff clay is stiff to very stiff clay to a depth of about 22 feet bgs. Groundwater was encountered along the force main alignment at a depth of about 4 feet bgs.

## Geological Hazards

According to the Mercer Island (2019) GIS, there is a potential erosion area along the west side of the King County property associated with NMPS. The site is also within a shallow landslide hazard area (Figure 1). The new generator building, retaining walls, and electrical and odor control facilities will require excavations of up to 8 feet bgs, the temporary pump station excavation will be approximately 35 feet deep, and the trench excavation for the force mains will range from 8 to 17 feet bgs.

Portions of the planned work at the NMPS and the adjacent right-of-way (ROW) of SE 22nd Street will require grading, excavation, and fill placement during the wet seasons from 2021 to 2023. Seasonal groundwater measurements indicate that levels in the clay soils are relatively stable throughout the year and, therefore, the geotechnical engineers (Shannon & Wilson 2019) concluded that the risk of landslides is not increased during wet season construction work. Recommendations include that all excavations be shored to support the ground during construction, an approved temporary erosion and sediment control (TESC) plan be implemented, and best management practices (BMPs), as described in the *Geotechnical Design Memorandum* and summarized below, be followed during wet season construction. Provided that these recommendations are followed, no safety problems, environmental harm or adverse environmental impacts to the site, ROW, or neighboring properties are likely to occur from grading, excavation, and fill activities to occur during the wet seasons. In addition, the geotechnical engineers note that there are no records of historic landslides at the NMPS site or along SE 22nd Street and no observed signs of past landslides in these areas.

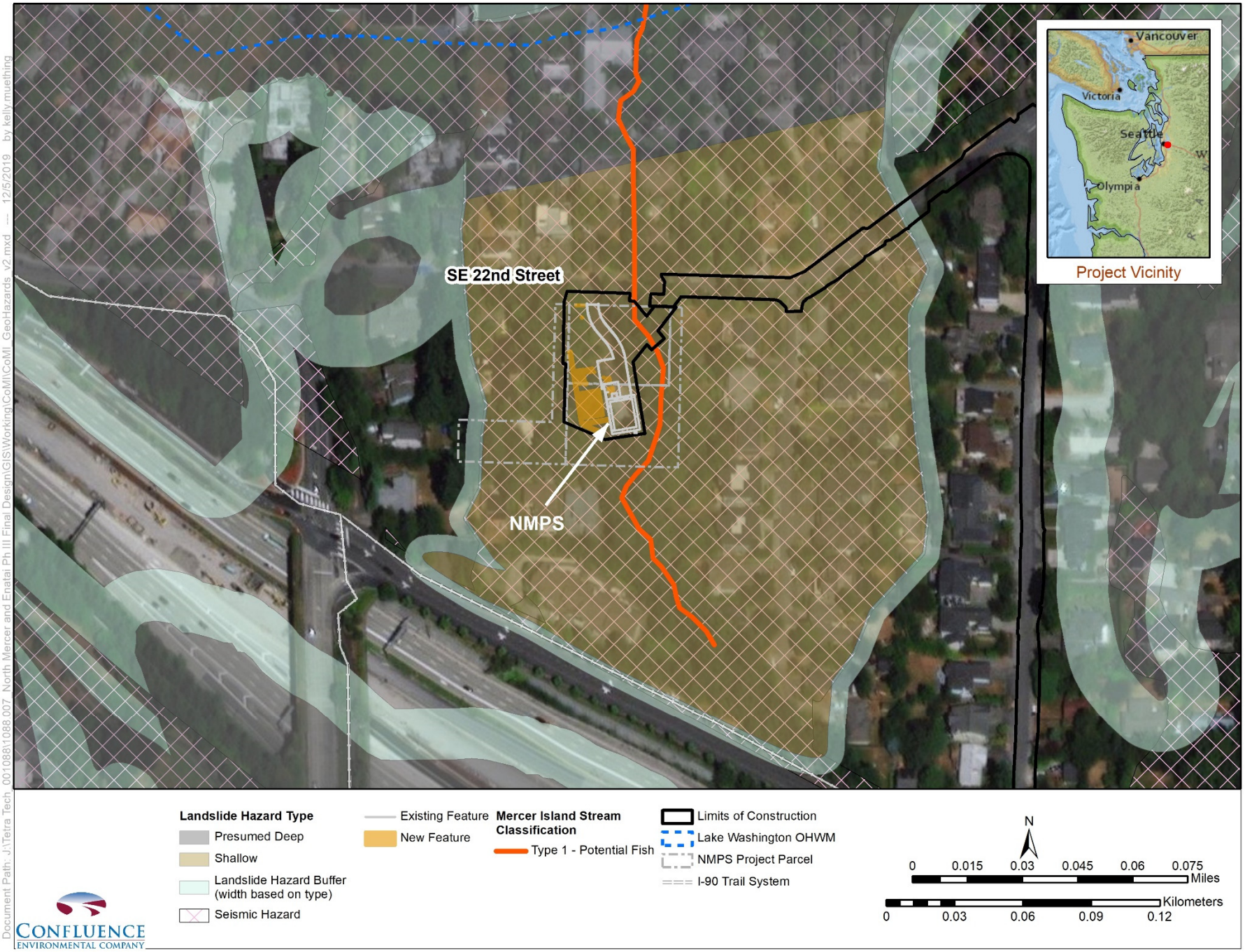



Figure 1. Geologically Hazardous Areas Surrounding NMPS

This area is also within a designated seismic hazard area associated primarily with the Seattle Fault Zone (Figure 1). Based on geotechnical boring data, the new generator building, retaining walls, electrical and odor control facilities, and pipeline will be constructed primarily in stiff to very stiff clay soils, which are not susceptible to seismic hazards including liquefaction or lateral spreading. Seismic design considerations have been applied to the final structures at the NMPS.

## Wet Season Best Management Practices

A TESC plan is provided in the working drawings (attached). General erosion control measures are identified in the *Project Narrative* for each work area. The contractor will be responsible for selecting the equipment and methods necessary to complete the work in accordance with NME Project specifications, but wet season earthwork will be unavoidable to maintain the project schedule.

The following BMPs are recommended in the *Geotechnical Design Memorandum* (Shannon & Wilson 2019) during wet season work:

- The ground surface in the construction area should be sloped to promote the runoff of precipitation away from work areas and to prevent ponding of water.
- Covering work areas or slopes with plastic, sloping, ditching, using sumps, dewatering, and other measures should be employed as necessary to permit proper completion of the work.
- Earthwork should be accomplished in small sections to minimize exposure to wet conditions. Excavation, or the removal of unsuitable soil, should be followed immediately by the placement of concrete or compaction of a suitable thickness (generally 12 inches or more) of clean structural fill. The size and type of construction equipment and its mode of mobility (wheels or track) should be selected to prevent soil disturbance. It may be necessary to excavate soils with a backhoe, Gradall, or equivalent, located so that the equipment does not traffic over the excavated area; thus, subgrade disturbance caused by equipment traffic will be reduced.
- Uncompacted soil should not be left exposed to moisture. Where vibration settlement-sensitive facilities are not located within 10 feet, a smooth-drum vibratory roller, or equivalent, should roll the surface to seal out as much water as possible.
- In-place soils or fill soils that are, or become, wet and unstable and/or are too wet to suitably compact should be removed and replaced with clean granular soil.
- Grading and earthwork should not be conducted during periods of heavy continuous rainfall.
- Excavation and placement of structural fill material should be observed on a full-time basis by an engineer or engineer's representative experienced in earthwork, to determine that all work is being accomplished in accordance with the intent of the specifications.

## Emergency Procedures

The following emergency procedures can be used during construction in the event of a natural or man-made disaster such as a landslide or erosion-control problem:

- Cease all work;
- Secure the area;
- Evaluate any safety issues; and
- Notify the City.

Once the site is secured and determined to be safe, conduct reconnaissance to determine the extent and cause of the problem. Based on the reconnaissance, develop and submit a remediation plan for review by the City. Implement the approved remediation plan. Examples of actions may include placement of a toe buttress to stabilize a landslide or modify drainage in conjunction with ground cover for erosion-control issues.

## Emergency Contact Information

The following emergency contacts will be posted at each job site in the event of a natural or man-made disaster such as a landslide or erosion-control problem (as provided on the next page).

| **CITY OF MERCER ISLAND CONTACT INFORMATION** | |
|---|---|
| **After Hours: call Police Non-Emergency** | **1.425.577.5656** |
| **During Regular Hours:** 8:30 am – 5:00 pm | |
| Development Services Ground (DSG) | 206.275.7605 |
| Public Works Department | 206.275.7608 |
| Police | 206.275.7610 |
| Fire | 206.275.7607 |
| **KING COUNTY WASTEWATER TREATMENT DIVISION CONTACT INFORMATION** | |
| Construction Manager (Fred Tervet) | 206.263.9520 (office), 206.949.1319 (cell) |
| Project Manager (Courtney Schaumberg) | 206.263.5776 |

# EMERGENCY: CALL 911

If you have any questions, please contact me at 206-263-0562, or email me at chris.dew@kingcounty.gov.

Sincerely,

Christopher Dew
Water Quality Planner/Project Manager

Enclosure(s): City of Mercer Island Seasonal Development Limitation Waiver Application Package – NMPS

King County

## References

Mercer Island. 2019. City of Mercer Island GIS Portal [online mapping]. Available at: https://chgis1.mercergov.org/Html5Viewer/Index.html?viewer=PubMaps&viewer=PubMaps (accessed on November 22, 2019).

Shannon & Wilson, Inc. 2019. Geotechnical Design Memorandum: North Mercer Island Interceptor and Enatai Interceptor Upgrade Project, King County, Washington. Prepared by Shannon & Wilson. Prepared for Tetra Tech, Inc., Seattle, Washington. 133 pp. Project No. 21-1-22000-213.

King County
Department of Natural Resources and Parks
Wastewater Treatment Division
**Regulatory Compliance and Land Acquisition Services**
King Street Center, KSC-NR-0505
201 South Jackson Street
Seattle, WA 98104-3855

March 9, 2020

Don Cole, Building Official
City of Mercer Island
9611 SE 36th Street
Mercer Island, WA 98040

North Mercer Island Interceptor and Enatai Interceptor Upgrade Project – Seasonal Development Limitation Waiver Application Package: Lift Station 11 – Transmittal Letter

King County Wastewater Treatment Division (WTD) is applying for various environmental and construction permits from the City of Mercer Island (Mercer Island). King County WTD identified a need for capacity upgrades for the North Mercer Island and Enatai interceptors. The North Mercer Island Interceptor and Enatai Interceptor Upgrade Project (NME Project) proposes to construct a new pipeline from Mercer Island to Bellevue. The proposed pipeline route that is covered in this construction application package includes modifications at Mercer Island's Lift Station 11 (LS11). The purpose of the NME Project is to increase the reliability and capacity of the regional wastewater system that carries flows from the North Mercer Pump Station (NMPS) to the Eastside Interceptor in Bellevue.

During the second pre-application meeting with Mercer Island's Development Services Group on September 11, 2019 (PRE19-042), and through additional conversations, it was determined that the NME Project will submit an application for a Seasonal Development Limitation Waiver, but provide flexibility within the application to update the Building Official as project information becomes available. For example, as the contractor's detailed schedule is created, updates will be provided to Mercer Island to schedule site visits.

This application includes the required documents for a waiver, including:

- Geotechnical Report
- Working Drawings
- Construction Schedule
- Erosion Control Plan
- Emergency Procedures
- Emergency Contact Information

The following information is a description of the geologically hazardous areas within the NMPS and LS11 work areas, and the proposed measures to control erosion and sediments during the wet season (October 1 through April 1). This information is summarized from the more detailed *Geotechnical*

*Design Memorandum* (Shannon & Wilson 2019), and amended as necessary. Also included in this information is a general construction schedule within each work area. Additional details on construction methods can be found in the *Project Narrative* by work area provided in the application materials for a building permit for the NME Project.

## LS11 at Fruitland Landing Park Work Area

Mercer Island has requested upgrades to the existing LS11 (3309 97th Avenue SE). LS11 upgrades will consist of motor upsizing, modifications to the existing dry and wet wells, a new valve vault, concrete slab for the electrical cabinets, and electrical improvements. The new valve vault will be an approximately 8 feet wide by 14 feet long precast concrete vault located at approximately 11 feet bgs. Shoring will be needed to install the new valve vault, likely using a slide-rail system in conjunction with well points to control groundwater. The electrical cabinet slab will be approximately 6 feet wide by 12 feet long.

There is an existing 340-linear feet (LF) force main along 97th Avenue SE that connects the regional wastewater system to LS11 located between LS11 and SE 34th Street. The existing force main will be extended by approximately 280 LF as a 10-inch-diameter pipe southward from the intersection of 97th Avenue SE and SE 34th Street to the new interceptor located near the Interstate 90 (I-90) Trail. The new pipe will be installed at a depth between 5 to 10 feet bgs. In addition, there will be cured-in-place pipe (CIPP) rehabilitation of the existing pipe. All work for the force main extension will occur within the street ROW.

### Construction Schedule

LS11 construction is expected to extend from March 2021 to August 2022 (18 months). Activities within sensitive habitats are prioritized to occur for as short a period as possible, including work along the shoreline of Lake Washington. Other sensitive areas, such as the piped stream located on the site, will be avoided or potential impacts controlled through the use of BMPs during construction. Earthwork will need to occur during the wet season from October 1, 2021 to April 1, 2022.

### Soil Conditions and Groundwater

The subsurface conditions at the new valve vault and concrete slab for the electrical cabinets at the Fruitland Landing site will consist of 7 feet of fill over medium dense silt and sandy silt to a depth of over 40 feet bgs. Groundwater is anticipated to be 2 feet bgs at this site.

For the new section of force main between SE 34th Street and the I-90 Trail, the subsurface conditions will vary, with the north end near SE 34th Street consisting of about 5 feet of very soft recessional lacustrine silts over very stiff to hard glaciolacustrine clays, and the south end near the I-90 Trail consisting of 7 feet of loose to medium dense fill over dense or very stiff glaciolacustrine silt and sandy silt. Groundwater is anticipated along the new section of force main at a depth of about 8 feet bgs.

### Geological Hazards

The new valve vault and electrical cabinet slab are located within the buffers for shallow and deep landslide hazard areas and a portion of the LS11 force main is located within a shallow landslide hazard area (Figure 1). The new valve vault will be installed in the Fruitland Landing and require an excavation

depth of about 11 feet bgs and the new LS11 force main will be installed within the ROW of 97th Avenue SE to depths of 7 to 10 feet bgs.

Portions of the planned work within the Fruitland Landing and the 97th Avenue SE ROW will require grading, excavation, and fill placement during the wet seasons from 2021 to 2022. The excavation for the new valve vault has a limited extent and will be shored and, therefore, the geotechnical engineers have concluded that the risk of landslides, particularly within a limited buffer zone, is not increased during wet season construction work. Based on the gradual grade of 97th Avenue SE and that the new force main will be installed perpendicular to the slope of the roadway, the geotechnical engineers have likewise concluded that the installation of the pipeline will not increase the risk of landslides within the roadway or neighboring properties. In conducting the work during the wet seasons, the geotechnical engineers recommend that all excavations be shored to support the ground during construction, that an approved TESC plan be implemented, and that the BMPs, as described in the *Geotechnical Design Memorandum* and summarized below, be followed during wet season construction. Provided that these recommendations are followed, it is the geotechnical engineers' opinion that no safety problems, environmental harm or adverse environmental impacts to the LS11 site, ROW, or neighboring properties will occur by allowing grading, excavation, and fill activities to occur during the wet seasons. In addition, the geotechnical engineer notes that there are no records of historic landslides at the LS11 site or along 97th Avenue SE, and the geotechnical engineer did not observe any signs of past landslides in these areas.

Both the new valve vault and LS11 force main are located within a designated seismic hazard area that is generally associated with the Seattle Fault Zone (Figure 1). The valve vault and force main will be installed within Fruitland Landing and the ROW of 97th Avenue SE to depths of 5 to 11 feet bgs. As discussed above, the soils will consist of 5 to 7 feet of fill or very soft recessional lacustrine silts over medium dense to dense silt or very stiff to hard glaciolacustrine clays with groundwater at depths of 2 to 8 feet bgs. The valve vault and pipeline will be located in medium dense silt or very stiff to hard clay, which are not susceptible to seismic hazards including liquefaction or lateral spreading. Seismic design considerations have been applied to the new valve vault structure.

## Wet Season Best Management Practices

A TESC plan is provided in the working drawings (attached). General erosion control measures are identified in the *Project Narrative* for each work area. The contractor will be responsible for selecting the equipment and methods necessary to complete the work in accordance with NME Project specifications, but wet season earthwork will be unavoidable to maintain the project schedule.

The following BMPs are recommended in the *Geotechnical Design Memorandum* (Shannon & Wilson 2019) during wet season work:

- The ground surface in the construction area should be sloped to promote the runoff of precipitation away from work areas and to prevent ponding of water.
- Covering work areas or slopes with plastic, sloping, ditching, using sumps, dewatering, and other measures should be employed as necessary to permit proper completion of the work.


Figure 1. Geologically Hazardous Areas Surrounding LS11

- Earthwork should be accomplished in small sections to minimize exposure to wet conditions. Excavation, or the removal of unsuitable soil, should be followed immediately by the placement of concrete or compaction of a suitable thickness (generally 12 inches or more) of clean structural fill. The size and type of construction equipment and its mode of mobility (wheels or track) should be selected to prevent soil disturbance. It may be necessary to excavate soils with a backhoe, Gradall, or equivalent, located so that the equipment does not traffic over the excavated area; thus, subgrade disturbance caused by equipment traffic will be reduced.
- Uncompacted soil should not be left exposed to moisture. Where vibration settlement-sensitive facilities are not located within 10 feet, a smooth-drum vibratory roller, or equivalent, should roll the surface to seal out as much water as possible.
- In-place soils or fill soils that are, or become, wet and unstable and/or are too wet to suitably compact should be removed and replaced with clean granular soil.
- Grading and earthwork should not be conducted during periods of heavy continuous rainfall.
- Excavation and placement of structural fill material should be observed on a full-time basis by an engineer or engineer's representative experienced in earthwork, to determine that all work is being accomplished in accordance with the intent of the specifications.

## Emergency Procedures

The following emergency procedures can be used during construction in the event of a natural or man-made disaster such as a landslide or erosion-control problem:

- Cease all work;
- Secure the area;
- Evaluate any safety issues; and
- Notify the City.

Once the site is secured and determined to be safe, conduct reconnaissance to determine the extent and cause of the problem. Based on the reconnaissance, develop and submit a remediation plan for review by the City. Implement the approved remediation plan. Examples of actions may include placement of a toe buttress to stabilize a landslide or modify drainage in conjunction with ground cover for erosion-control issues.

## Emergency Contact Information

The following emergency contacts will be posted at each job site in the event of a natural or man-made disaster such as a landslide or erosion-control problem (as provided on the next page).

King County

| CITY OF MERCER ISLAND CONTACT INFORMATION | |
|---|---|
| **After Hours: call Police Non-Emergency** | **1.425.577.5656** |
| **During Regular Hours:** 8:30 am – 5:00 pm | |
| Development Services Ground (DSG) | 206.275.7605 |
| Public Works Department | 206.275.7608 |
| Police | 206.275.7610 |
| Fire | 206.275.7607 |

| KING COUNTY WASTEWATER TREATMENT DIVISION CONTACT INFORMATION | |
|---|---|
| Construction Manager (Fred Tervet) | 206.263.9520 (office), 206.949.1319 (cell) |
| Project Manager (Courtney Schaumberg) | 206.263.5776 |

# EMERGENCY: CALL 911

If you have any questions, please contact me at 206-263-0562, or email me at chris.dew@kingcounty.gov.

Sincerely,

Christopher Dew
Water Quality Planner/Project Manager

Enclosure(s): City of Mercer Island Seasonal Development Limitation Waiver Application Package – LS-11

## References

Shannon & Wilson, Inc. 2019. Geotechnical Design Memorandum: North Mercer Island Interceptor and Enatai Interceptor Upgrade Project, King County, Washington. Prepared by Shannon & Wilson. Prepared for Tetra Tech, Inc., Seattle, Washington. 133 pp. Project No. 21-1-22000-213.

King County
Department of Natural Resources and Parks
Wastewater Treatment Division
**Regulatory Compliance and Land Acquisition Services**
King Street Center, KSC-NR-0505
201 South Jackson Street
Seattle, WA 98104-3855

March 9, 2020

Don Cole, Building Official
City of Mercer Island
9611 SE 36th Street
Mercer Island, WA 98040

North Mercer Island Interceptor and Enatai Interceptor Upgrade Project – Seasonal Development Limitation Waiver Application Package: Mercer Island Boat Launch – Transmittal Letter

King County Wastewater Treatment Division (WTD) is applying for various environmental and construction permits from the City of Mercer Island (Mercer Island). King County WTD identified a need for capacity upgrades for the North Mercer Island and Enatai interceptors. The North Mercer Island Interceptor and Enatai Interceptor Upgrade Project (NME Project) proposes to construct a new pipeline from Mercer Island to Bellevue. The proposed pipeline route that is covered in this construction application package includes construction activities at the North Mercer Island Boat Launch. This work area is where the proposed North Mercer Island Interceptor pipeline alignment joins with the proposed new alignment for the East Channel Siphon. The boat launch is located along the shoreline of Lake Washington. The purpose of the NME Project is to increase the reliability and capacity of the regional wastewater system that carries flows from the NMPS to the Eastside Interceptor in Bellevue.

During the second pre-application meeting with Mercer Island's Development Services Group on September 11, 2019 (PRE19-042), and through additional conversations, it was determined that the NME Project will submit an application for a Seasonal Development Limitation Waiver, but provide flexibility within the application to update the Building Official as project information becomes available. For example, as the contractor's detailed schedule is created, updates will be provided to Mercer Island to schedule site visits.

This application includes the required documents for a waiver, including:

- Geotechnical Report (see the building permit application)
- Working Drawings (see the building permit application)
- Construction Schedule (see below)
- Erosion Control Plan (see attached sheets)
- Emergency Procedures (see below)
- Emergency Contact Information (see below)

The following information is a description of the geologically hazardous areas at the Mercer Island Boat Launch work area, and the proposed measures to control erosion and sediments during the wet season (October 1 through April 1). This information is summarized from the more detailed *Geotechnical Design Memorandum* (Shannon & Wilson 2019), *Supplemental Geotechnical Letter Report for Geologically Hazardous Areas along the Conveyance Alignment* (Shannon & Wilson 2020), and amended as necessary. Also included in this information is a general construction schedule specific to the Mercer Island Boat Launch work area. Additional details on construction methods can be found in the *North Mercer Island Interceptor and East Channel Siphon: Project Narrative* provided in the application materials for a building permit for the NME Project.

Please note that an application for the two other components of the NME Project on Mercer Island that are required to obtain a seasonal development limitation waiver for construction during the wet season – the North Mercer Pump Station (NMPS) and Lift Station 11 (LS11) – was submitted on December 21, 2019. These components of the NME Project do not appear in this application.

## Mercer Island Boat Launch Work Area

The existing Mercer Island Boat Launch (3600 East Mercer Way, Parcel Number 082405-9310) work area is the where the North Mercer Island Interceptor and East Channel Siphon connect. Installation of this pipe will occur at the northern end of the Mercer Island Boat Launch through a lawn area to the beach of Lake Washington. The lawn area is separated from the beach by a low (approximately 4-foot) concrete bulkhead that is failing in several locations. The work area is located just to the north of the I-90 East Channel Bridge. The work area is located approximately 300 linear feet (LF) from the actual boat launch, and will not affect traffic or use of the boat launch area.

There are four proposed activities that will involve earthwork: (1) install operations and maintenance access vault (Siphon Maintenance Structure), (2) install new pipes above the ordinary high water mark (OHWM), (3) install new pipes below the OHWM, and (4) replace a portion of the existing bulkhead. The only geologically hazardous area is a steep slope (54%) protected by a low (approximately 4-foot) bulkhead that is composed of failing concrete with some rip-rap armoring likely part of a temporary fix to the failing bulkhead. This area will be impacted to install the new connection between the North Mercer Island Interceptor and East Channel Siphon. The bulkhead will be partially removed (65 LF out of 128 LF) and replaced with a more ecologically-friendly alternative during construction.

### Construction Schedule

The Mercer Island Boat Launch work will occur from June 2021 to November 2022 (Table 1). Work in this area will need to occur during the wet season (October 1 to April 1) in both years of construction.

**Table 1. Construction Sequencing for the NME Project on Mercer Island**

| Work Area | Proposed Actions | Construction Sequencing | Duration (months) |
|---|---|---|---|
| Mercer Island Boat Launch (North Mercer Island Interceptor) | • Begins after the installation of the shoring system (upland)<br>• In-water work begins as soon as the in-water fish work window opens<br>• Ends after site restoration of the bulkhead and planting the riparian area behind the bulkhead | • Jun 2021<br>• Jul 2022<br>• Nov 2022 | 18 |

Activities within sensitive habitats will be prioritized to occur for as short a period as possible. Site-specific restrictions will affect the timing and duration of construction activities. Construction timing will adhere to approved in-water fish work windows along the shoreline of Lake Washington, as determined by the U.S. Army Corps of Engineers and Washington Department of Fish and Wildlife.

## Soil Conditions and Groundwater

Based on the four earthwork activities described above, the groundwater conditions for each location include the following:

- **Operations and Maintenance Access Vault:** The subsurface soils consist of approximately 12 feet of medium dense fill over very dense glaciolacustrine deposits. These deposits are considered to be good to very good foundation soils. The operations and maintenance structure will be about 9.5 feet wide by 16 feet long and founded approximately 10 feet below ground surface (bgs). The groundwater level at this location was observed at approximately 21 feet bgs. Therefore, the groundwater is well below the structure, but perched water may be encountered above the glaciolacustrine deposits.
- **Pipe above OHWM:** The soils within the area where the new North Mercer Island Interceptor pipeline alignment is proposed consists of up to 12 feet of loose to medium dense fill over very dense glaciolacustrine deposits consisting of silt, sandy silt, and silt with sand. In the steep portion of the slope, located within 50 feet of the shoreline, the fill becomes shallow and the very dense glaciolacustrine deposits are near the surface. In this area, the very dense glaciolacustrine deposits are 11 feet thick and underlain by hard silty clay. Groundwater levels vary from 2 feet bgs at the shoreline to 21 feet bgs upslope near the operations and maintenance structure.
- **Pipe below OHWM:** Beach substrate along the shoreline is dominated by cobble, gravel, and mud. The subsurface soils consist of loose to dense recessional deposits to depths of up to 15 feet below the mudline. Underlying the recessional deposits is dense to very dense weathered and intact till and till-like deposits. The recessional deposits and till and till-like deposits consist of silty sand, silty sand with gravel, silty gravel with sand, and sandy gravel.
- **Bulkhead Replacement:** This area is consistent with the transition between the above OHWM and below OHWM described above.

## Geological Hazards

Based on Mercer Island (2020) hazards maps and qualified geotechnical expert consultation (Mike Kucker, pers. comm., 2020), the only geologically hazardous area at the Mercer Island Boat Launch work area is the steep slope located within both WSDOT and Mercer Island ROWs (Figure 1). The slope extends upland of the OHWM from a failing bulkhead through a section of mixed lawn and roadway (see the Development Plan Set Sheet C232). Although there are seismic hazard areas both north and south of the Mercer Island Boat Launch work area, they are not located in the work area itself according to Mercer Island (2020).

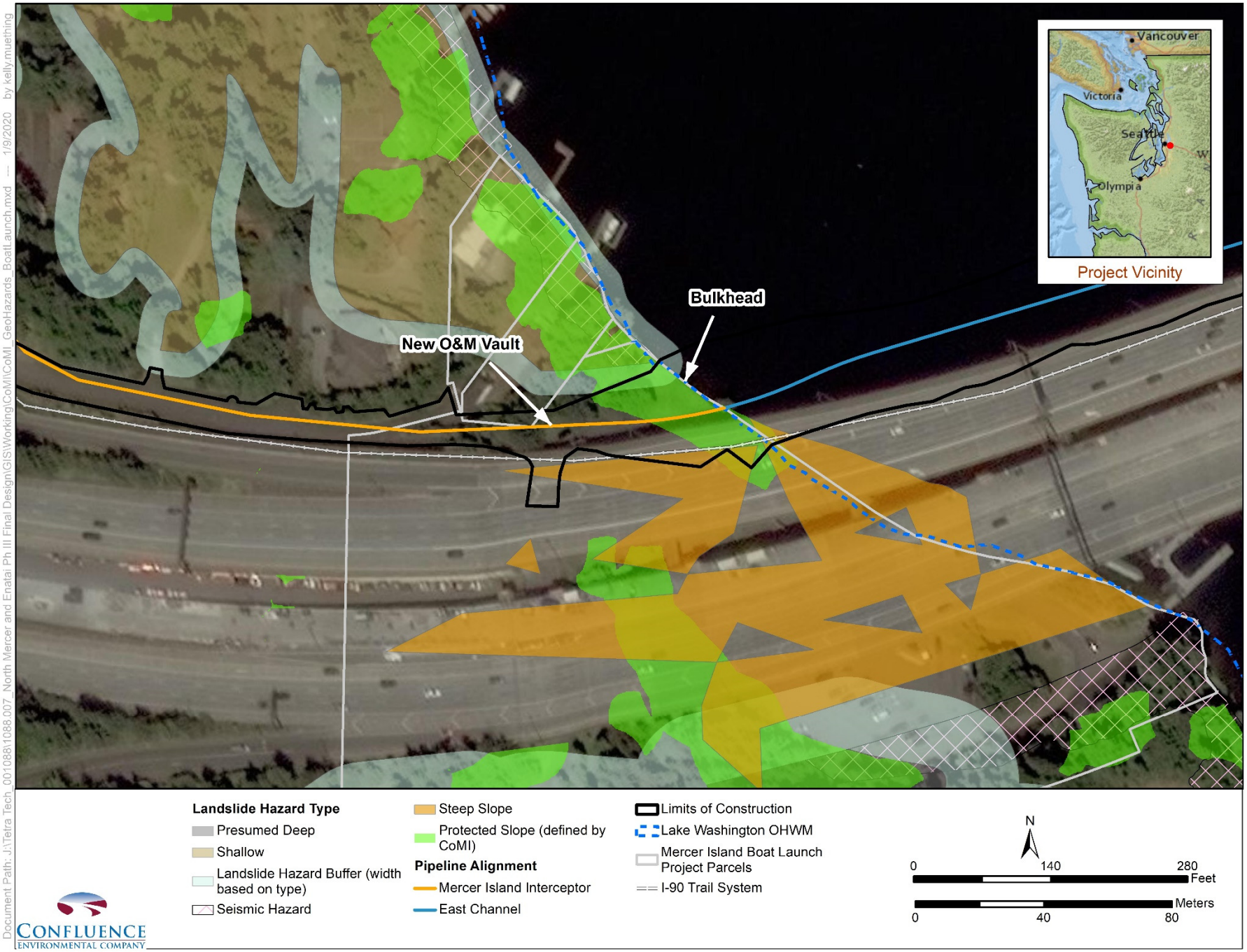



Figure 1. Geologically Hazardous Areas Surrounding the North Mercer Island Boat Launch

The planned work within the Mercer Island Boat Launch will require grading, excavation, and fill placement during the wet seasons from 2021 to 2022. The excavation for the new operations and maintenance access vault has a limited extent and will be shored and, therefore, the geotechnical engineers have concluded that the risk of landslides in the steep slope is not increased during wet season construction work. In addition, since the new pipes will be installed mostly perpendicular to the steep slope, the geotechnical engineers have likewise concluded that the installation of the pipes will not increase the risk of landslides within the boat launch work area or neighboring properties.

In conducting work during the wet seasons, the geotechnical engineers recommend that all excavations be shored to support the ground during construction, that an approved Temporary Erosion and Sediment Control (TESC) plan be implemented, and that the BMPs, as described in the *Geotechnical Design Memorandum* (Shannon & Wilson, 2019) and summarized below, be followed during wet season construction. Provided that these recommendations are followed, it is the geotechnical engineers' opinion that no safety problems, environmental harm or adverse environmental impacts to the boat launch work area or neighboring properties will occur by allowing grading, excavation, and fill activities to occur during the wet seasons. In addition, the geotechnical engineer notes that there are no records of historic landslides within the boat launch work area and the geotechnical engineer did not observe any signs of past landslides in this area.

## Wet Season Best Management Practices

A TESC plan for the Mercer Island Boat Launch work area is provided in the working drawings (attached). General erosion control measures are identified in the *North Mercer Island Interceptor and East Channel Siphon: Project Narrative*. The contractor will be responsible for selecting the equipment and methods necessary to complete the work in accordance with NME Project specifications, but wet season earthwork will be unavoidable to maintain the project schedule.

The following BMPs are recommended in the *Geotechnical Design Memorandum* (Shannon & Wilson 2019) during wet season work:

- The ground surface in the construction area should be sloped to promote the runoff of precipitation away from work areas and to prevent ponding of water.
- Covering work areas or slopes with plastic, sloping, ditching, using sumps, dewatering, and other measures should be employed as necessary to permit proper completion of the work.
- Earthwork should be accomplished in small sections to minimize exposure to wet conditions. Excavation, or the removal of unsuitable soil, should be followed immediately by the placement of concrete or compaction of a suitable thickness (generally 12 inches or more) of clean structural fill. The size and type of construction equipment and its mode of mobility (wheels or track) should be selected to prevent soil disturbance. It may be necessary to excavate soils with a backhoe, Gradall, or equivalent, located so that the equipment does not traffic over the excavated area; thus, subgrade disturbance caused by equipment traffic will be reduced.
- Uncompacted soil should not be left exposed to moisture. Where vibration settlement-sensitive facilities are not located within 10 feet, a smooth-drum vibratory roller, or equivalent, should roll the surface to seal out as much water as possible.
- In-place soils or fill soils that are, or become, wet and unstable and/or are too wet to suitably compact should be removed and replaced with clean granular soil.

- Grading and earthwork should not be conducted during periods of heavy continuous rainfall.
- Excavation and placement of structural fill material should be observed on a full-time basis by an engineer or engineer's representative experienced in earthwork, to determine that all work is being accomplished in accordance with the intent of the specifications.

Please refer to the *Geotechnical Design Memorandum* (Shannon & Wilson 2019) for other construction and structure support recommendations for the Mercer Island Boat Launch work area.

## Emergency Procedures

The following emergency procedures can be used during construction in the event of a natural or man-made disaster such as a landslide or erosion-control problem:

- Cease all work;
- Secure the area;
- Evaluate any safety issues; and
- Notify Mercer Island.

Once the site is secured and determined to be safe, conduct reconnaissance to determine the extent and cause of the problem. Based on the reconnaissance, develop and submit a remediation plan for review by Mercer Island. Implement the approved remediation plan. Examples of actions may include placement of a toe buttress to stabilize a landslide or modify drainage in conjunction with ground cover for erosion-control issues.

## Emergency Contact Information

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| Public Works Department | 206.275.7608 |
| Police | 206.275.7610 |
| Fire | 206.275.7607 |
| **KING COUNTY WASTEWATER TREATMENT DIVISION CONTACT INFORMATION** | |
| Construction Manager (Fred Tervet) | 206.263.9520 (office), 206.949.1319 (cell) |
| Project Manager (Courtney Schaumberg) | 206.263.5776 |

# EMERGENCY: CALL 911

King County

If you have any questions, please contact me at 206-477-5458, or email me at chris.dew@kingcounty.gov.

Sincerely,

Christopher Dew
Water Quality Planner/Project Manager

Enclosure(s): City of Mercer Island Seasonal Development Limitation Waiver Application Package – Mercer Island Boat Launch

## References

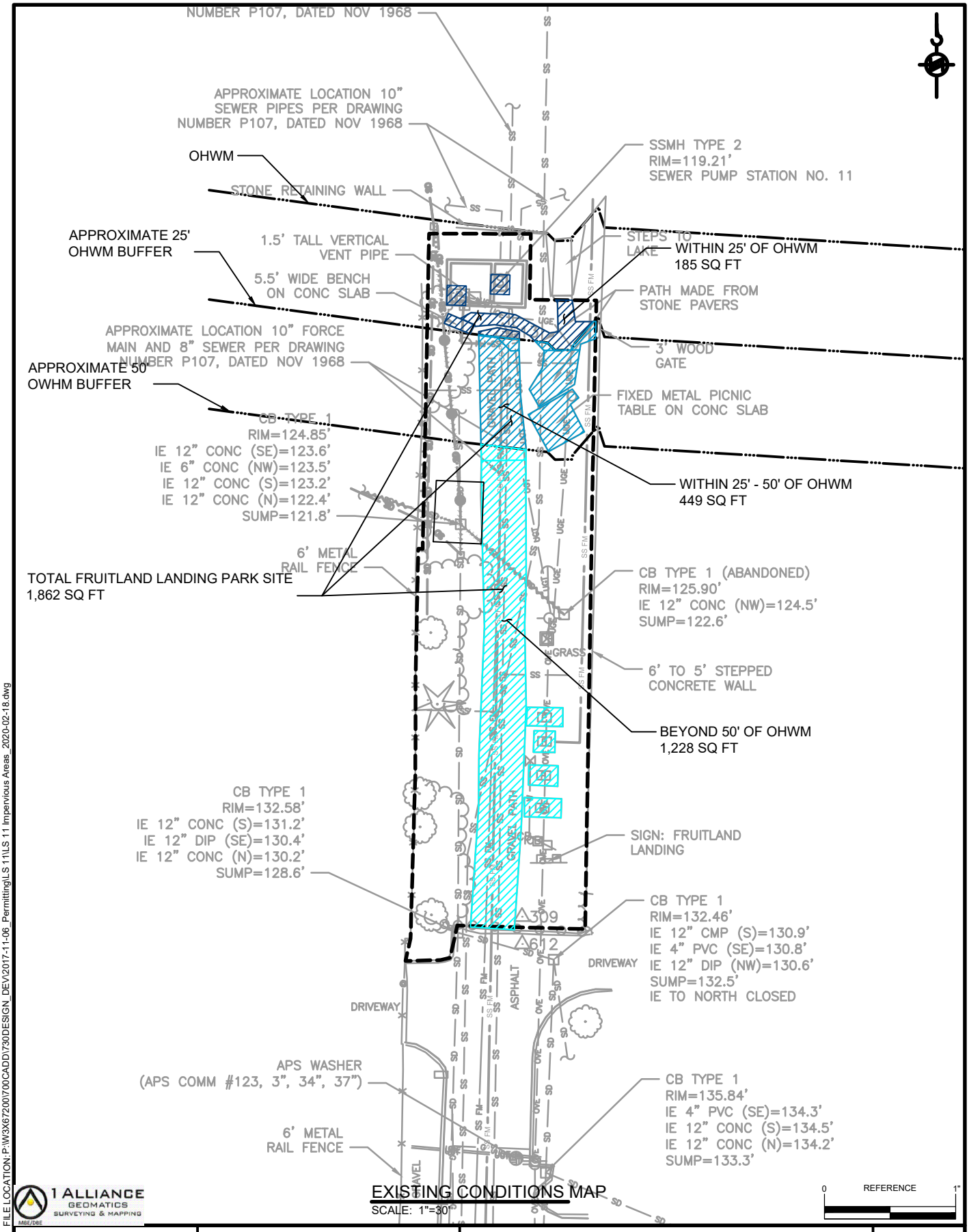
Kucker, M. 2020. Personal communication regarding geologically hazardous areas in the Mercer Island Boat Launch work area. Shannon and Wilson. Email: msk@shanwil.com

Mercer Island. 2020. City of Mercer Island GIS Portal [online mapping]. Available at: https://chgis1.mercergov.org/Html5Viewer/Index.html?viewer=PubMaps&viewer=PubMaps (accessed on January 6, 2020).

Shannon & Wilson, Inc. 2019. Geotechnical Design Memorandum, North Mercer Island Interceptor and Enatai Interceptor Upgrade Project, King County, Washington. Prepared by Shannon & Wilson. Prepared for Tetra Tech, Inc., Seattle, Washington. 133 pp. Project No. 21-1-22000-213.

Shannon & Wilson, Inc. 2020. Supplemental Geotechnical Letter Report for Geologically Hazardous Areas along the Conveyance Alignment. Prepared by Shannon & Wilson. Prepared for Tetra Tech, Inc., Seattle, Washington. 12 pp. Project No. 21-1-22000-213.

# Attachment 4:
# Lift Station 11 Impervious Surface Updates




EXISTING CONDITIONS MAP
SCALE: 1"=30'

0 REFERENCE 1"

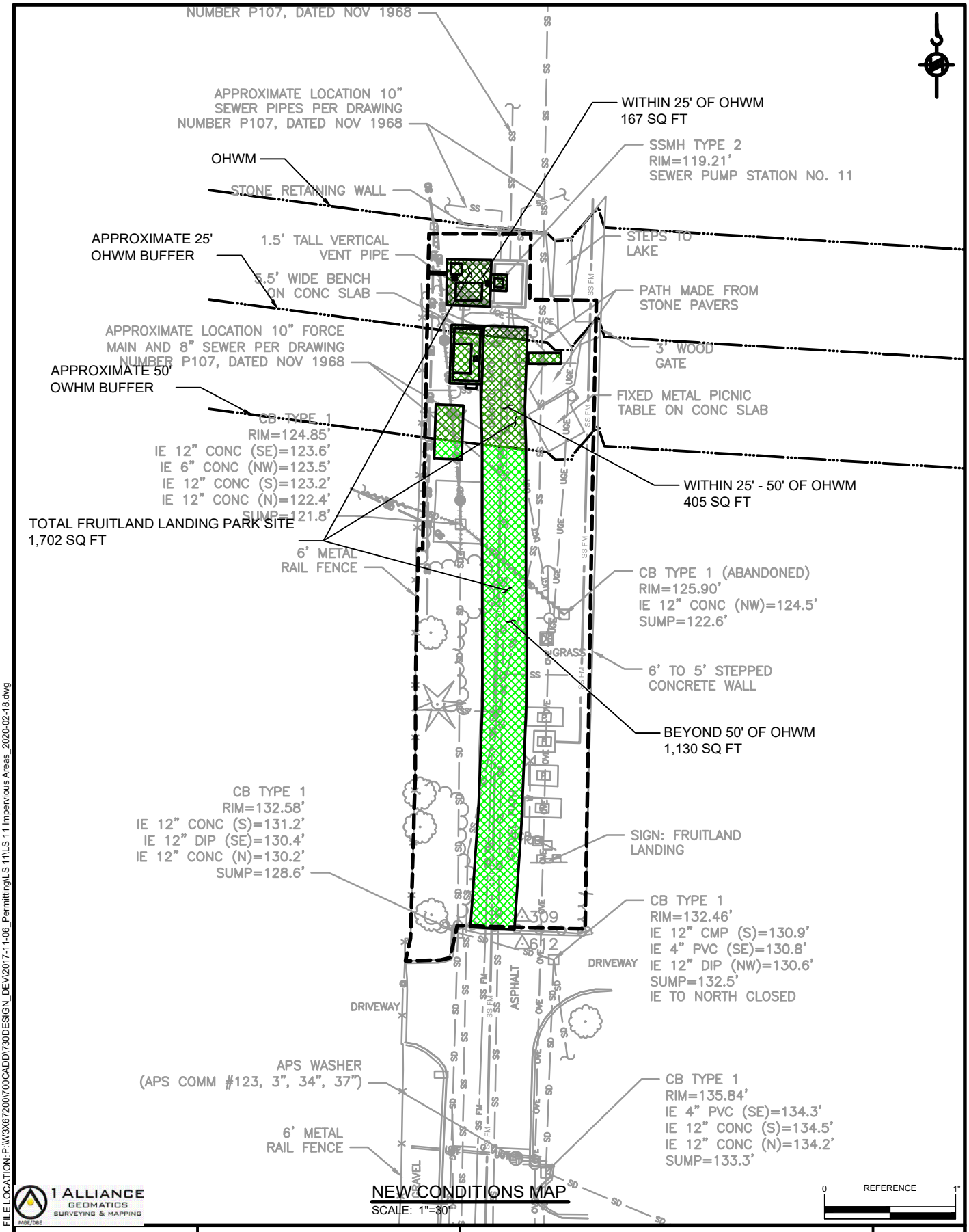
1 ALLIANCE GEOMATICS SURVEYING & MAPPING MBE/DBE

FILE LOCATION:P:\W3X67200\700CADD\730DESIGN_DEV\2017-11-06_Permitting\LS 11\LS 11 Impervious Areas_2020-02-18.dwg

JACOBS

LIFT STATION 11 IMPROVEMENTS

**HARD SURFACES EXISTING CONDITIONS**




NEW CONDITIONS MAP
SCALE: 1"=30'

1 ALLIANCE GEOMATICS SURVEYING & MAPPING
MBE/DBE

FILE LOCATION:P:\W3X67200\700CADD\730DESIGN_DEV\2017-11-06_Permitting\LS 11\LS 11 Impervious Areas_2020-02-18.dwg

JACOBS

LIFT STATION 11 IMPROVEMENTS

**HARD SURFACES NEW CONDITIONS**