MORAN PROPERTY
CRITICAL AREAS REPORT, IMPACT ANALYSIS, & MITIGATION PLAN
CITY OF MERCER ISLAND, WASHINGTON

Prepared for:

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Mercer Island, 98040

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April 11, 2022 (**Revised January 5, 2023**)

TABLE OF CONTENTS

Appendix A - Figure 1 – Vicinity Map
Figure 2 – Site Topography and Drainage
Figure 3 – National Wetland Inventory
Figure 4 – City of Mercer Island Critical Areas Mapping
Figure 5 – NRCS Soils
Figure 6 – Critical Areas Existing Conditions

Appendix B - Plan Sheet 1 – Proposed Development, Impacts, and Mitigation

Appendix C - Wetland Determination Datasheets

Report Summary

Client:	Edward and Catherine Moran 5028 West Mercer Way Mercer Island, WA 98040
Project site:	0.42-acre site, Parcel No. 1924059244 located at 5028 West Mercer Way Mercer Island, Washington 98040.
Critical Area Assessed:	Off-site Type Np stream; off-site Type Ns stream; piped watercourse 1, and non-jurisdictional Wetland A.
Regulatory Guidance:	MICC 19.07.180.A and establishes the following aquatic area types and MICC 19.07.180.C establishes standard buffer widths: Type F Waters – 120 feet with 10-foot minimum building setback; Type Np Waters – 60 feet with 10-foot minimum building setback; Type Ns Waters – 60 feet with 10-foot minimum building setback; and Piped Waters – No buffer with 45-foot minimum building setback. MICC 19.07.190 establishes the following wetland categories and standard buffer widths (based on habitat function): Category I Wetland – 75-110 feet (based on habitat function) with 10-foot minimum building setback; Category II Wetland – 75-110 feet (based on habitat function) with 10-foot minimum building setback; Category III Wetland – 60-110 feet (based on habitat function) with 10-foot minimum building setback; and Category IV Wetland – 40 feet with 10-foot minimum building setback.

Introduction

This Critical Areas Study was prepared for Edward and Catherin Moran, by Convergent Ecosystems (Convergent). Convergent conducted a site visit to confirm the location of mapped piped and open watercourses along the north end of the Project Site and to confirm the extent of their buffers onto the Project Site with implication to the proposed development. The entire site and public rights-of-ways within the Study Area were investigated for the presence of any previously unidentified wetlands and streams. This report is consistent with the requirements of Mercer Island City Code (MICC 19.07.110) for use in the current building permit (#2112-249) and any other permitted land use alterations for five years following its approval. This report includes a full characterization of existing site conditions, critical areas, buffers and setbacks, as well as existing information sources used for determining critical areas.

Field work and report preparation was led by Rosemary Baker, Convergent Ecosystems principal ecologist and senior internal review provided by professional wetland scientist Mark Merkelbach (PWS #001837) of Green Earth Operations, Inc.

Project Location

The Project Site is located on the east side of West Mercer Way approximately 0.3-mile east of the Lake Washington shoreline, 0.3-mile north of Island Crest Park, and 1.5 miles southwest of Interstate (I) 90 in the City of Mercer Island, Washington (City). The project location consists of a generally rectangular parcel abutting West Mercer Way on its west side, a private driveway to the north, and developed private properties to the east and south. The Project Site address is 5028 West Mercer Way, Mercer Island, WA 98040 (NW ¼ Section 19 of Township 24 N and Range 5 E W.M.) (**Appendix A/Figure 1**). The Project Site is a single 0.42-acre parcel (1924059244) and located in Water Resource Inventory Area (WRIA) 8 (Cedar-Sammamish).

Project Purpose and Description

The purpose of this report is to document all existing critical areas and an analysis of impacts and mitigation for a proposed single-family residential development associated with a current City of Mercer Island permit under critical areas review (#2112-249). In addition to the current permit, this documentation will support future building permit processes and will be valid for up to five years once approved by the City. This documentation of on-site and nearby off-site critical areas also offers the necessary background information for design alternatives, mitigation sequencing, and mitigation design as necessary.

The proposed development includes the building of a new 2,664 square foot (SF) residence with associated paved access driveway, front walkway, retaining wall, and landscaping.

Current Site Use and History

The Project Site is located in what was historic Puget Sound lowland forestland which is now within the incorporated City of Mercer Island. The site has remained undeveloped and consists of a regenerating

forest situated on a west-facing slope. The forest canopy is deciduous-dominant with patchy understory shrubs and groundcovers dominated by non-native invasive species. Site conditions including steep slopes on the east and west sides and a central terrace where development is proposed (**Photos 1-2**) (**Appendix A/Figure 2**). The project area is zoned by the City as R-15 (Single Family with minimum 15,000 SF lots) (MI 2022a).

	
Photo 1. View of the central interior portion of the Moran property (looking south). Photo taken 3-17-22.	**Photo 2.** View of the central interior portion of the Moran property (looking north). Photo taken 3-17-22.

Study Area

The study area for this investigation is limited to the single parcel listed in this report and the extent of adjoining properties which are known to or may have critical areas with buffers within a 200-foot radius of the Project Site (**Appendix A/Figures 1 and 6**). The investigation was performed within the project site property boundaries in addition to off-site areas accessible by public rights-of-way. Background research was conducted on pre-existing critical areas within the Study Area. Within the Study Area critical areas (if encountered) were flagged and delineated with GPS and classified per the guidance required by federal, state, and local agencies. Within the Study Area drainage ditches (if any) were also investigated for the presence of wetland characteristics and likelihood of USACE jurisdiction. See the *Methods* section below for further details.

Methods

Wetland Delineation, Identification, and Classification

Waters of the United States (U.S.), including wetlands, were investigated, and delineated within the project site boundaries consistent with the technical approaches outlined in the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory 1987), and the *Regional Supplement to USACE Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (Environmental Laboratory 2010).

In general, wetland delineation consisted of three main tasks: (1) assessing vegetation, soil, and hydrologic characteristics to identify areas meeting the wetland identification criteria, (2) evaluating constructed drainage features to determine if they would be regulated as wetlands, and (3) marking wetland boundaries where those occur on-site, if any. Within the City of Mercer Island per MICC 19.16.010 wetlands are defined as:

> *"Areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands do not include artificial wetlands, such as irrigation and drainage ditches, grass-lined swales, canals, landscape amenities, and detention facilities or those wetlands, created after July 1, 1990, that were unintentionally created as a result of the construction of a road or street unless the artificial wetlands were created to mitigate the alteration of a naturally occurring wetland. For identifying and delineating a regulated wetland, the city will use the Wetland Manual."*

Sampling locations were selected at sites representative of the area. Dominant plant species in each of the three strata (tree, sapling/shrub, and herb) were identified using northwest flora field guides (Cook 1997 and Pojar 1994). Unless otherwise noted in field data sheets due to local conditions, trees were identified within a 30-foot radius of an established data plot, scrub/shrub vegetation was identified within a 10-foot radius, and herbaceous vegetation was identified within a 3-foot radius. A determination of the presence of hydrophytic vegetation was made at each observation point in accordance with the USACE guidelines (Environmental Laboratory 2010).

The determination of the presence of hydric soils was consistent with the USACE Regional Supplement (Environmental Laboratory 2010). The Soil Survey of King County Area (NRCS 1973) provided information regarding the general characterization of the soils in the area, the parent material, as well as series, taxonomy and subgroup information. Soils were examined to a depth of approximately 20 inches, or the depth at which it could be confirmed that positive indicators were either present or absent. Soil colors were described in data forms using the Munsell soil color charts' numbering system (Munsell Color 2000). This numeric color classification system is used by the USACE Regional Supplement in determining if hydric soil indicators are present in a sample.

Hydrology data was collected from field observations and reference documents. Annual climate records and monthly precipitation during site visits were obtained from the Mercer Island 1.5 NW weather station (NOAA 2022). Upon site inspection, the presence of direct and indirect hydrologic indicators was

used to infer wetland hydrology. Field indicators of wetland hydrology were determined in accordance with the USACE guidelines (Environmental Laboratory 2010).

Wetlands, if observed, on the subject property were classified according to the USFWS classification system (Cowardin et al. 1979). This system is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate. Wetlands were also classified according to the hydrogeomorphic (HGM) wetland classification system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993).

Wetland Rating

Mercer Island City Code (MICC) 19.07.190.A requires the classification of wetlands using the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby 2014). The rating system assesses a wetland's potential to provide water quality, hydrologic, and habitat functions at a site-specific level as well as in relation to existing land use in the surrounding landscape. It also incorporates consideration of the wetland's hydrologic and geomorphic conditions into the system by assigning the wetland an hydrogeomorphic (HGM) classification. This allows for a more accurate rating of how well the wetland functions based on its position in the landscape, water source, and the flow and fluctuation of the water once in the wetland. The 2014 Rating System divides wetlands into four hierarchical categories based on specific attributes such as rarity, sensitivity to disturbance, and our ability to replace them. The classification hierarchy ranges from Category I wetlands, which exhibit outstanding features (rare wetland type, relatively undisturbed or a high sensitivity to disturbance, high level of functions) to Category IV wetlands, which have the lowest levels of function and are often heavily disturbed. The rating categories are used to identify permitted uses in the wetland and its buffer, to determine the width of buffers needed to protect the wetland from adjacent development, and to identify the mitigation ratios required to compensate for potential impacts on wetlands.

When wetlands are encountered, they are rated per Ecology rating system, and wetland buffer widths determined according to that rating, per MICC 19.07.190.C.

Stream Classification

Streams were noted within the Site and its immediate vicinity. Washington State defines a watercourse, river, or stream as "*any portion of a channel, bed, bank, or bottom waterward of the ordinary high-water line of waters of the state, including areas in which fish may spawn, reside, or pass, and tributary waters with defined bed or banks, which influence the quality of fish habitat downstream. This includes watercourses which flow on an intermittent basis or which fluctuate in level during the year and applies to the entire bed of such watercourse whether or not the water is at peak level. This definition does not include irrigation ditches, canals, storm water run-off devices, or other entirely artificial watercourses, except where they exist in a natural watercourse that has been altered by humans*" (WSL 2015; 222-110-220.105).

Watercourses are classified using the water typing system in MICC 19.07.190.A, which are as follows:

- Type S waters (there are no known Type S watercourses on Mercer Island);

- Type F waters (fish-bearing);
- Type Np waters (which include all segments of aquatic areas that are not Type S or F waters and which contain year-round surface flows);
- Type Ns waters (which include all segments of aquatic areas that are not type S, F, or Np waters and which do not contain surface year-round surface flows).
- Piped (these are segments of watercourses which flow sub-surface within pipes and hydraulically altered.

Determination of Fish and Wildlife Habitat Conservation Areas

The presence of any fish and wildlife habitats of importance on the site were determined based on the following criteria listed in MICC 19.07.170:

(1) Areas with which state or federally designated endangered, threatened, and sensitive species have a primary association;

(2) Priority habitats and areas associated with state priority species identified by the Washington State Department of Fish and Wildlife;

(3) Areas used by bald eagles for foraging, nesting, and roosting, or within 660 feet of a bald eagle nest;

(4) Watercourses and wetlands and their buffers; and:

(5) Biodiversity areas;

Results

Existing Information Review

Google Earth aerial imagery, project maps, and critical areas mapping of the area was reviewed prior to visiting the site in order to identify vegetation patterns, topography, soils, streams, and other natural resources potentially located within the project boundaries and relevant to this report. The following is a summary of the known critical areas at the Project Site.

Landscape Setting

The project site is located in the central, interior of the City of Mercer Island, an entirely land-locked island surrounded by Lake Washington with the City of Seattle to the west and the cities of Bellevue, Factoria, and Newcastle to the east. In relation to major landmarks the project site is located 1.5 miles southwest of I-90 (at its closest point) and approximately 0.3 miles north of Island Crest Park. The majority of the historic land cover at this site and in the surrounding landscapes was once old-growth Puget Sound lowland forest amidst rolling terraces and steep terrain with networks of small streams and wetlands. Mercer Island has been converted to urban commercial development along the I-90 corridor on the north end of the island and urban residential development throughout the rest of the island with the exception of pocket parks and green spaces which preserve native forests and stream corridors. The project site is a currently undeveloped privately owned parcel.

Watershed Description

This project site is located in the Pacific Northwest Region 17 (USGS 5th HUC 17110012001312) (USGS 2022) and associated with Lake Washington within WRIA 8 (Cedar-Sammamish) (Ecology 2022). According to the USGS elevation contours, elevations at the site range between approximately 182 and 222 feet above sea level (**Appendix A/Figures 1 and 5**). The entire site has sloped topography which drains generally from east to west until it reaches a ditch and road impoundment on the east side of West Mercer Way located just off-site along the west edge of the property.

Climate, Precipitation, and Growing Season

The Puget Sound lowlands experience a mild to moderate temperate climate with average annual rainfall that can vary widely with elevation, latitude, and proximity to the central Cascade foothills. Approximately 1.9 miles northwest of the site, the nearest weather station (Mercer Island 1.5 NW station) has recorded 38 inches of average annual rainfall from the years 2009-2021 (NOAA 2022). Given winter conditions, relatively low precipitation was recorded in the 10 days preceding the site investigation. The Mercer Island weather station recorded 5.15 inches of rainfall in December 2021, 5.25 inches in January 2022, and another 3.87 inches in February prior to the March field work (NOAA 2022).

The closest local growing season data for the Puget Sound lowlands comes from data collected at the Seattle-Tacoma Airport weather station. At this location, local growing season is approximately 320 days in length, typically from end of January to mid-December (using the 5 years in 10 criteria and 28˚ F)

(NOAA 2022). The USACE Delineation Manual requires that an area must be inundated or saturated for two consecutive weeks of the growing season in order to have wetland hydrology (Environmental Laboratory 2010).

Critical Areas Overview

Stream and Wetland Inventory

The National Wetland Inventory (NWI) is compiled by the U.S. Department of Interior Fish and Wildlife Service (USFWS 2022). NWI relies upon visual aerial photo interpretation of wetland, stream, and other aquatic area indicators including hydrologic, vegetation and topographic signatures. Wetlands areas identified under NWI are also classified in accordance with the Cowardin classification system (Cowardin et al. 1979). The NWI mapping does not identify wetlands within the project site (**Appendix A/Figure 3**). NWI identifies and classifies a 1.12-acre seasonally-flooded, intermittent, stream (R4SBC) crossing the northwest corner of the Project Site. This is a section of stream which appears to originate from Island Crest Way to the east and which drains west directly into Lake Washington. The closest wetland mapped by NWI is Ellis Pond, a .78-acre freshwater emergent and scrub-shrub semi-permanently flooded (PEM1/SSF) wetland, approximately 0.49-mile to the northeast. Another seasonal, intermittent stream is mapped by NWI as crossing under West Mercer Way approximately 0.14-mile to the northwest of the Project Site.

Washington Department of Natural Resources (WDNR) Forest Application Mapping Tool identifies the same stream as NWI which is mapped as crossing the northwest corner of the Project Site. WDNR designates this section of stream mapped on-site as non-fish bearing and the lowest portion of this same stream as fish-bearing approximately 800 feet to the west, and west of West Mercer Way, where topography generally flattens out at the toe of slope (WDNR 2022a). WDNR maps a second non-fish bearing stream to the north in the same location as the seasonal stream identified by NWI. No other streams or wetlands are identified by WDNR within the project vicinity.

King County does not map any wetlands or streams within the Project Site or Study Area; however, it does map erosion hazard zone throughout the project vicinity (KC 2022a).

The City of Mercer Island's critical areas online mapping indicates there are several critical areas on-site and immediately adjacent to the Project Site (MI 2022b) (**Appendix A/Figure 4**). An intermittently Type Ns (non-fish seasonal) stream and piped watercourse is mapped as crossing the northwest corner of the Project Site. Specifically, the section of this stream which is mapped on-site is a portion of its piped section however a portion of a 60-foot buffer of an un-piped section just off-site to the northwest is mapped as extending onto the northwest corner of the property. Additionally, the piped section of the same stream which runs generally northeast to southwest off-site to the north is mapped as having a 45-foot setback area which extends onto the property. City of Mercer island's critical areas mapping also indicates there is a small portion of Type Np 60-foot buffer which extends onto the property at the southwest corner. Protected slope areas and erosion hazard zone are also mapped by the City throughout the Project Site and surrounding Study Area.

Soil Survey of King County

The National Resource Conservation Service (NRCS) soil survey indicates that the soils within the site are mapped as Alderwood gravelly sandy loam (8 to 15 percent slopes) (AgC) and very steep Alderwood and Kitsap soils (AkF) (NRCS 2022a) (**Appendix A/Figure 5**).

Alderwood soils are described by United States Department of Agriculture (USDA) NRCS as consisting of moderately well drained soils that formed in glacial drift and/or glacial outwash over dense glaciomarine deposits. They occur on ridges and hills with a range of elevation from 50 to 800 feet with slopes from 8 to 15 percent (USDA 2000). Very steep Alderwood and Kitsap series soils are also moderately well drained soils formed from basal till with some volcanic ash on moraines and till plains. They range in elevation from 50 to 800 feet with steep slopes that range from 25 to 70 percent (USDA 2017). Alderwood-Kitsap complex soils and Kitsap silt loams are listed as hydric in King County (NRCS 2022b).

Sensitive Plants, Fish, Wildlife, and Habitats

According to the Washington State Department of Natural Resources (WDNR) Washington Natural Heritage Program (WNHP) database, there are no known threatened/endangered plant species or high-quality ecosystem present in the section, township, and range in which the site is located (S19/T24N/R5E) (WDNR 2022b).

Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) data does not identify or map any TES/priority species or habitats on the Project Site or within 300 feet of the property (WDFW 2022a). WDFW SalmonScape online maps a seasonal non-fish bearing stream crossing the Project Site in the generally same location as NWI and WDNR (WDFW 2022b).

Steep Slopes and Erosion Hazard Areas

The City of Mercer Island maps steep slopes, Erosion Hazard Areas (EHA), and landslide hazard areas on this Project Site and regulates them as Geologically Hazardous Areas (GHA) through their critical areas ordinance (MICC 19.07.160). Steep slopes (GHAs) were confirmed along the east property boundary and along the west property boundary adjacent to West Mercer Way (**Appendix A/Figure 2 and Appendix B/Plan Sheet 1**). There has been no prior development on this property and the current site development proposal utilizes the flatter central terrace portion of the property. There is no development proposed within steep slope areas. GHAs on-site will remain forested and undisturbed and do not present a hazard in relation to the current permit development application (**Appendix B/Plan Sheet 1**).

Site Investigation

Overview of Site Conditions

A site visit was performed on March 17, 2022 by Convergent principal ecologist, Rosemary Baker. This property consists of a west-facing hillslope dominated by deciduous upland forest. No wetlands or streams were identified on the undeveloped portion of the Project Site. All areas within 300 feet of the property were investigated and are described in detail below.

Site Topography and Hydrology

Elevations on the site range between 182 and 222 feet above sea level (USGS 2022) (**Appendix A/Figure 2**). Topography at this site fluctuates between a central terrace and steep slopes along the east and west property boundaries (**Photos 1-2, and 4**). The highest point is along the eastern edge and lowest gradient is along the west side of the site.

Overall, steep slopes occur on approximately one half of this property; however, no evidence of slope sloughing or soil instability was observed during the site investigation. All sloped areas are forested with either understory shrubs or groundcovers. Across the undeveloped and vegetated portions of this site water flow originates from direct precipitation. Along the north end of the property stormwater runoff is directed east to west down a private driveway access road until the northwest corner of the Project Site (**Appendix A/Figures 2 and 6**). Just off-site to the west is a drainage ditch feature which receives all stormwater runoff from the private driveway to the north as well as minor amounts of surface and groundwater discharge from the Project Site. This ditch is located off-site between the toe of a steep slope section and the east side of West Mercer Way.

Vegetation Community

On-site vegetation consists of a single vegetation class of closed-canopy deciduous forest vegetation dominated by big leaf maple (*Acer macrophyllum*), English holly (*Ilex aquifolium*), cherry laurel (*Prunus leurocerasis)*, and English ivy (*Hedera helix*). Other species present on-site include western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), ornamental cherry (*Prunus* sp.), western sword fern (*Polystichum munitum*), and dull Oregon grape (*Mahonia nervosa*).

Critical Areas Summary

One piped watercourse was observed on the Project Site during the February 2022 field investigation (**Table 1**). Three streams (typed watercourses), two ditches, and one unregulated wetland were identified off-site within the Study Area. Below are their individual summaries.

Table 1. On-site Critical Areas Summary

Critical Area	Wetland Category[1]/Water Type	Size (SF)	Standard King County Buffers[2, 3] (ft)
Wetland A	unregulated	205	N/A

Stream 1	Type Ns	N/A	60
Piped Watercourse	N/A	N/A	No buffer/45-foot Setback
Stream 2	Np	N/A	60
Stream 3	Ns	N/A	60
Ditch 1	Likely jurisdictional	N/A	N/A
Ditch 2	Jurisdictional	N/A	N/A

[1] Wetland rating based on 2014 Update to the *Washington State Wetland Rating System for Western Washington* (Hruby 2014).
[2] Wetland Buffers based on MICC 19.07.190.C
[3] Stream Buffers based on MICC 19.07.180.C

Unregulated Wetland A

Wetland A is a 205 square feet, linear depressional wetland feature within the road embankment ditch (Ditch 1) along the east side of West Mercer Way (**Appendix A/Figure 6** and **Appendix B/Plan Sheet 1**). Wetland A occurs within the northern half of Ditch 1. This portion of Ditch 1 is somewhat wider and is the lowest point within Ditch 1. The area of Ditch 1 that met wetland conditions is also in closest proximity to the main source of hydrology to Ditch 1. Ditch 1/Wetland A receives seasonal stormwater runoff from the private driveway access road running northeast to southwest along the north side of the Project Site (**Photo 3**). Wetland A has a single emergent vegetation class dominated by giant horsetail (*Equisetum telmateia*) with minor components of English ivy, bittersweet nightshade (*Solanum dulcamara*), creeping buttercup (*Ranunculus repens*), Watson's willowherb (*Epilobium watsonii*), and American speedwell (*Veronica americana*) (**Photo 4**).

A soil pit was excavated within a representative portion of Wetland A (**Photo 5**) (**Appendix A/Figure 6 and Appendix B/Plan Sheet 1**). Within sample plot (SP) 1 (**Photo 6**), the top 15 inches of soil consisted of a black (10YR 2/1) muck containing high organic content with lots of undecomposed leaves, branches mixed with fine mineral deposits (see also attached Wetland Determination Data Forms). Below 15 inches of the ground surface, soils were a dark gray (2.5Y 4/1) silty sandy muck with a likely mineral layer below; however, soils were too loose and saturated/flooded to excavate further. Soils within this sample plot met the Black Histic (A3) and likely also the Histic Epipedon (A2) hydric soil indicators.

	
Photo 3. View of driveway access road at north end of Project Site which directs stormwater to Ditch 1/Wetland A.	**Photo 4.** View of Wetland A within Ditch 1, looking south. Photo taken 3-17-22.

	
Photo 5. View of soil pit 1 (SP-1) at north end of Ditch 1/Wetland A, looking south. Photo taken 3-17-22.	**Photo 6.** View of soil profile within Wetland A at SP-1. Photo taken 3-17-22.

Primary wetland hydrology indicators of high-water table (A2), saturation (A3), and hydrogen sulfide odor (C1) were encountered at SP-1. A secondary hydrology indicator (D2 – Geomorphic position) was also present within the sample plot. The main sources of hydrology to Wetland A are stormwater directed from the private access driveway at its north end as well as stormwater runoff from West Mercer Way with very minor groundwater discharge from the toe of slope along its east side. No seeps or springs were observed along the eastern uphill side slope; however, giant horsetails were observed growing 1-2 feet up from the eastern toe of slope. Wetland A occurs at the bottom of and is contained entirely within the lowest section of Ditch 1 (**Appendix A/Figure 6** and **Appendix B/Plan Sheet 1**). Wetland conditions do not extend the full length of Ditch 1. At the south end of Ditch 1 is an approximately 6-inch-wide overflow pipe conveying stormwater either south or west beyond the Study Area. The outlet of Ditch 1 is well beyond the boundary of Wetland A though during excessive periods of rain or winter storm events it is likely that Wetland A has intermittent overflow into the outlet of Ditch 1. As evidenced by surrounding topography, the impoundment of the road embankment, the intentional direction of stormwater, and the clear linear excavation made to create the drainage ditch for West Mercer Way, Wetland A is not a naturally occurring feature. Nor is there any evidence that historic wetland conditions existed in this location nor evidence of an historic source for wetland hydrology. If it were not for the construction of West Mercer Way along this hillslope, Ditch 1 and Wetland A would not exist. If it were not for a significant source of stormwater being directed into Wetland A, Ditch 1 would not contain wetland conditions. Additionally, though there was a minor indicator of groundwater discharge along the eastern edge of Wetland A and toe of slope where horsetails were growing, this is easily attributed to the steep and deep cut originally made in the hillside to form a flattened roadbed for West Mercer Way. It is natural that through the excavations that were made to the hillslope some amount of groundwater would be encountered at its current elevation.

In Washington State and in the City of Mercer Island, artificially created wetlands, particularly those created by the construction of a road or street (with no historic alteration of a pre-existing wetland) are unregulated and no buffers shall apply. In Convergent's best professional judgement, Wetland A is identified as an unregulated, artificially created wetland and therefore no buffer will apply.

Off-Site Stream 1

Stream 1 is an approximately 20-25 feet long, un-piped, open section of a Type Ns stream that was identified off-site along the east side of West Mercer Way (**Appendix A/Figure 6** and **Appendix A/Plan Sheet 1**). Stream 1 conveys flows north from a piped watercourse into another mapped Type Np stream (Stream 2). Stream 1 is the downstream end of the same Type Ns stream mapped as flowing northeast to southwest as a piped watercourse beneath the private access driveway along the north end of the property (**Photos 7-8**) (**Appendix A/Figure 6**). During the March investigation Stream 1 was observed conveying a minor surface flow from the piped watercourse. Stream 1 is a seasonal drainage and Type Ns stream which is currently being applied with a 60-foot stream buffer within the City's critical areas mapping.

During the site investigation, this segment of open stream channel appeared to have received recent improvements. Fresh grading of sloped soils, composted mulch, and fresh river rock cobble and landscape boulders were observed throughout the side channels and surrounding buffer to the south and east (**Photos 7-9**). Erosion control fabric was also present within the channel indicating recent soil

grading work all the way down to the stream bottom. Additionally, new landscape plantings including western sword ferns had been recently installed throughout the eastern sloped buffer and south buffer areas. In comparison to an older Google Earth Street-view image (**Photo 10)** of the same area the conditions in this location appear to have changed significantly and show evidence of a potential daylighting project. Convergent Ecosystems inquired with the City of Mercer Island for any approved critical areas report and daylighting plan for this work. City Planner and reviewer for this project, Andrew Leon, confirmed that there is no record of a daylighting project in this location (A. Leon, pers. comm. March 29, 2022); however, the City will consider there may have been a project that went undocumented and if the current conditions within Stream 1 satisfy the MICC 19.07.180(C)(6)(c) the City will approve an adjusted buffer for Stream 1. For further details on how the current conditions satisfy this portion of the code see the Mitigation Plan and proposed buffer reduction section.

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<td>Photo 7. View of private access driveway on north end of Project Site where the piped watercourse is located as evidenced by the two drains. Looking east. Photo taken 3-17-22.</td>
<td>Photo 8. View of the drain grate and area where the piped watercourse connects with the open and possibly daylit section of the Type Ns stream, looking north. Photo taken 3-17-22.</td>
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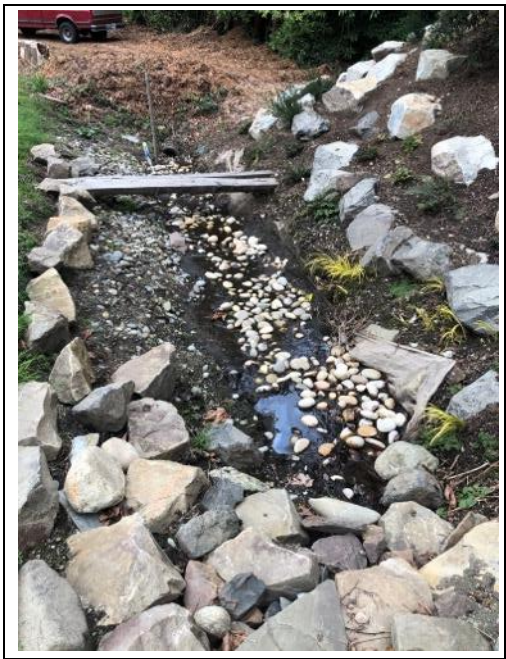

Photo 9. View of the open or daylit section of the Type Ns stream including fresh side slope soils, grading, rock, erosion control fabric, and river rock within the bottom of the channel, looking north. Photo taken 3-17-22.

Photo 10. View of the same area as Photos 7-9 (prior to the 2022 growing season). Photo from Google Earth Street view.

Off-Site Stream 2

Stream 2 was confirmed as being an off-site, likely Type Np watercourse to the north of the Project Site (**Appendix A/Figure 6**). Significant water flow was observed within its channel. As it is an off-site feature it could not be delineated. The location of Stream 2 and its 60-foot buffer is estimated on Figure 6. The buffer of Stream 2 encompasses Stream 1 and overlaps with a portion of the piped watercourse setback area along the north end of the Study Area. No work nor impacts are proposed within Stream 2 or its 60-foot stream buffer.

Off-Site Stream 3

No streams (surface or piped) or stream buffers were encountered on the ground at the southwest corner of the property as are indicated by the city's critical areas mapping. The closest identified stream to the south of the Moran property is Stream 3 which is more than 200 feet from the Project Site (**Appendix A/Figure 6**). The flow path of off-site Stream 3 could only be estimated as it was also located on private property; however, a drain grate was observed which indicated Stream 3 conveys water west through a pipe beneath West Mercer Way and potentially further as the property immediately to the west of West Mercery Way is developed. Flow observed within Stream 3 was steady and is likely a Type Np watercourse which receives a 60-foot buffer.

Off-site Ditch 1

Ditch 1 occurs west of the Project Site between the Moran property and West Mercer Way and is technically an off-site drainage feature. Ditch 1 is a linear drainage ditch that receives, detains, and infiltrates stormwater runoff from the private access driveway along the north side of the Project Site as well as stormwater from West Mercer Way. It appears likely that Ditch 1 was constructed in uplands at the same time as West Mercer Way (**Photos 11-12**) (**Appendix A/Figure 6**). The north ½ of Ditch 1 is wider, and lower than the southern portion. The northern half is also closest to its main source of hydrology and therefore contains Wetland A as described above. A six-inch concrete pipe outlet was observed at the south end of Ditch 1 which appears to convey overflow during storm events. City of Mercer Island's storm system utilities layer indicates a series of piped storm mains and catch basin along the east side of West Mercer Way between Ditch 1 and Ditch 2/Stream 3. Conditions of surface or sub-surface connectivity on the ground did not entirely match those mapped by the City; however, there is undoubtedly stormwater conveyance north to south along this stretch of the road. Due to this potential connectivity between Ditch 1 and Stream 3, Ditch 1 is likely to be considered a jurisdictional ditch.

Photo 11. View of north end of Ditch 1, looking south. Photo taken 3-17-22.

Photo 12. View of the south end of Ditch 1, (near outlet), looking north. Photo taken 3-17-22.

Off-Site Ditch 2

Ditch 2 is off-site and located approximately 200 feet southwest of the Project Site. Ditch 2 is a portion of the networked drainage system constructed to manage stormwater along West Mercer Way. During the

site investigation Ditch 2 was conveying significant surface flow into Stream 3 indicating it likely receives drainage from multiple sources of underground pipes and downspouts, not just from Ditch 1. No other watercourses, ditches, or sources of stormwater were observed at the surface between Ditch 1 and Ditch 3.

On-Site Stream Buffer and Piped Watercourse Setback Area Conditions

The existing on-site stream buffer and piped watercourse setback areas remain vegetated as the site is currently undeveloped (**Photos 13-14**) (**Appendix A/Figure 6**). The majority of the overlapping buffer and setback area is dominated by invasive species including English holly, cherry laurel, and English ivy. The portion of the buffer/setback area that comes onto the Moran property currently has few trees and little to no native vegetation. There is restoration potential within these areas through removal of invasive species and the planting of native vegetation.

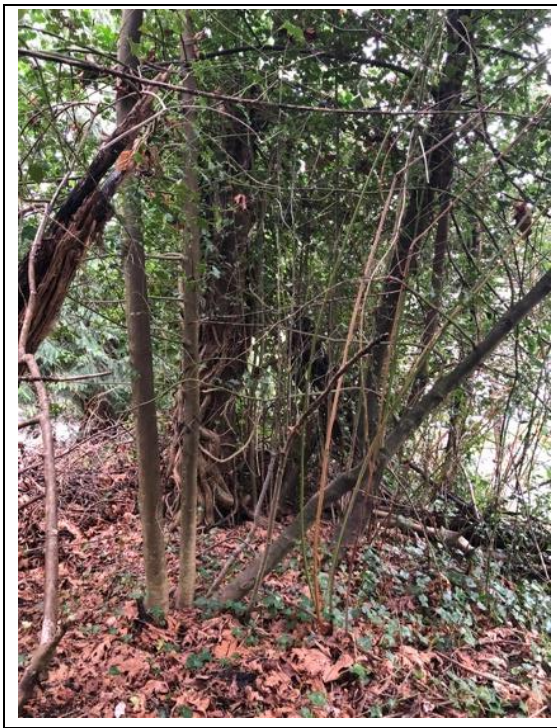

Photo 13. View of north end of Ditch 1, looking south. Photo taken 3-17-22.

Photo 14. View of the south end of Ditch 1, (near outlet), looking north. Photo taken 3-17-22.

Project Impacts and Mitigation

Avoidance and Minimization

The project design footprint is proposed in what is the flattest, buildable upland area on this sloped parcel. The proposed single-family residence, driveway, and associated support infrastructure constitutes a reasonable use of the property (**Appendix B/Plan Sheet 1**). Mitigation sequencing was utilized during the re-design phase of this project in order to avoid and minimize impacts to critical areas to the greatest extent practicable. The entrance driveway was re-designed multiple times and moved further upslope to the east in order to avoid impacts to Ditch 1/Wetland A and the piped watercourse setback area. This project also proposes measures that lead to avoiding impacts with the existing buffer of Stream 1 and Stream 2. The driveway must be located at the north side of the property as this is where the driveway easement is located and as this is the only practical access onto the property. The driveway is located as far to the east as possible. There were limits to the angle of the approach due to steep gradient and limitations to legal rights to use the private access road further upslope where the driveway is no longer tied into the parcel where it overlaps with the private road. Driveways are allowed within piped watercourse setback areas per MICC 19.07.180(C)(8)(d) so long as they are consistent with the storm water master program. All impacts to wetlands or streams have been avoided.

Due to the necessary placement of the proposed driveway footprint there is intrusion through a piped watercourse setback area. City of Mercer Island piped watercourse setback areas protect potential riparian habitats which could someday provide buffer function in the scenario of stream daylighting. There are on-site opportunities to improve the vegetative structure and habitat conditions within the site's piped watercourse setback area which are proposed below and which more than satisfy the intent of mitigation per MICC 19.07.180(E). **Table 2** discusses how the proposed project design meets the requirements of mitigation sequencing.

Table 2. Project Mitigation Sequencing.

Sequencing	Project Elements
Avoid	• Due to the conditions of what appear to be daylighting improvements within Stream 1 and its buffer; the project proposes to reduce the buffer of Stream 1 from 60 feet to 15 feet with a 10-foot building setback. Revising the appropriate stream buffer in this location also avoids buffer impacts at the northwest corner of the Project Site. • The driveway was re-aligned to the east and avoids direct impacts to Ditch 1/Wetland A as well as Stream 1 and 2 buffers. • The stormwater detention vault is able to be located entirely outside the piped watercourse setback area. • The retaining wall needed to secure soils on the uphill side was moved south and east and entirely outside of the piped watercourse setback area.
Minimize	• The proposed driveway entrance was re-aligned further east. Access to the property will be from the

	shared, private access driveway and not directly from West Mercer Way which minimizes the area of impervious surface proposed within the watercourse buffer/setback areas.
Rectify	• N/A; no temporary disturbance is proposed. All impacts are permanent.
Reduce or eliminate through preservation or maintenance	• Remaining portions of the piped watercourse setback area shall be either improved/restored/landscaped with native plants or left undeveloped.
Compensate	• The project proposes to stewardship activities which make improvements to two sections of the piped watercourse setback area along the access driveway. The areas proposed for stewardship activities more than satisfy the intent of code requirements for mitigation and mitigation area compensation.

Proposed Stream Buffer Reduction

It has been confirmed through written correspondence with the City of Mercer Island planning department that the City will consider a revision to the buffer width of Stream 1 given evidence of recent, undocumented stream improvements that may have been an off-site daylighting project adjacent to the Project Site. The City will allow the existing 60-foot buffer to be reduced to a 15-foot buffer with a 10-foot building setback if the observed improvements to Stream 1 satisfy the standards of MICC 19.07.180(C)(6)(c).

This code section requires that:

1. The watercourse channel will be stable and is not expected to cause safety risks or environmental damage;

The channel side slopes of Stream 1 appear to have been re-graded and reinforced by large boulders. Erosion control fabric was also applied (Photo 9). Fresh gravel has also been applied to the bottom of the channel for stability of sediments and slowing of seasonal surface flow. The swale which contains Stream 1 is not deep nor steep and does not appear to be a safety hazard.

2. No additional impact nor encumbrance by watercourse buffer or critical area setback is added to properties neighboring the applicant(s) property.

As the improvements made to this stream section were not a result of the applicant and appear to be the result of prior actions by adjacent property owners, this proposal for updating the watercourse buffer and setback is a purely administrative request. No additional impacts or encumbrances are proposed. There would be no impact to neighboring properties as a result of this proposed buffer reduction. This section of open or daylit stream also remains well protected by the Type Np watercourse (Stream 2) and the piped watercourse setback areas to the west and east.

According to observations made during the site investigation of this critical areas study and impacts analysis, the current conditions in Stream 1 meet the standards and intent of MICC 19.07.180(C)(6)(c). Therefore, buffer reduction is proposed on **Appendix B/Plan Sheet 1**. Under this proposal, only a small section of the Type Ns watercourse buffer of Stream 1 and its BSBL overlap with the Project Site. This buffer and BSBL area is currently located within the private access driveway. No further development or site improvements are proposed in this small area on-site.

Impacts Analysis

After several rounds of design, the entrance driveway is the only intrusion through the on-site piped watercourse setback area (**Appendix B/Plan Sheet 1**). Driveways are an allowed structure within watercourse setback areas per MICC 19.07.180(C)(8)(d). Stewardship activities and vegetation improvements to portions of the setback area on either side of the driveway are proposed to offset this impact.

Table 2. Critical Areas Impacts and Mitigation

Proposed Development	Proposed Critical Area	Impact Area (sf)	Mitigation Ratio and Proposed Mitigation Area (sf)
Driveway	Piped Watercourse Setback Area	Non-impact allowed intrusion; 2 NS (non-significant/likely non-native trees)	~1:1 voluntary stewardship/native planting in an equivalent area of the Setback
TOTALS		**N/A**	**363 sf**

Management of stormwater from the proposed driveway shall occur within the footprint of the driveway itself and does not create further impacts to the piped watercourse setback area (**Appendix B/Plan Sheet 1**). An over-sized stormwater detention vault with sufficient capacity to manage impervious surfaces within the driveway will be located outside the piped watercourse setback area. The revised drainage design on Plan Sheet 1 is drawn conceptually. Refer to the updated civil drainage design sheets from JMJTeam for complete details on stormwater management and for confirmation that all stormwater from this proposed project is adherent to MICC 15.09 and the City's stormwater master program as per MICC 19.07.180(C)(8)(d).

According to the critical areas overlay and tree survey conducted by Tree Solutions, Inc., two trees identified as "non-significant" shall require removal within the piped watercourse setback area. These two trees are likely non-native English holly or cherry laurel (**Photo 2**) and are identified on **Appendix B/Plan Sheet 1** in the eastern half of the on-site piped watercourse setback area in the area proposed for the driveway and stewardship native landscaping areas. The consulting arborist has already provided a tree replacement plan for the property for all tree removals. This report proposes the planting of native landscaping along the driveway which shall include a small number of additional native shrubs and groundcovers which more than compensate for the removal of any trees and other non-native vegetation within the setback area due to the driveway.

Proposed Setback Area Stewardship Activities

MICC does not specifically set conditions or impacts to mitigation ratios for unavoidable impacts within a piped watercourse setback area. The intent of applying setback areas to watercourses which no longer exist at the surface is to allow for protection or preservation of undeveloped habitats along these corridors with the potential and code-driven incentivization of stream daylighting. The portion of piped watercourse setback area on the Moran's property remains undeveloped but also highly degraded. A driveway is an allowed feature within setback areas and there is no code-specified impact-to-mitigation ratio within a piped watercourse setback area stated within MICC 19.07.180.

Under this proposal, there will be two remaining portions of the setback area which can be improved to offset the identified project impacts (**Table 2**). Proposed site stewardship activities will be consistent with the tree replacement and vegetation improvements proposed by the consulting arborist. The southwest corner of the setback area is thick with vegetation, more steeply sloped, and a significantly-sized native conifer will be retained in this area. Not all of these areas are in need of native re-vegetation, nor will site stewardship activities be practical on steep slopes. To compensate for unavoidable and very minor impacts to the setback area from the driveway, site stewardship activities are proposed in approximately 363 square feet of the setback area and entrance driveway areas (**Appendix B/Plan Sheet 1**). The area proposed for stewardship activities are essentially two native plant landscaping strips along both sides of the sloped entrance driveway. Landscaping with native plants along this section of the setback will restore vegetated conditions within the clearing limits once the driveway is built, improve long-tern slope stability, provide an uplift in habitat complexity and diversity, as well as beautification and value to the property.

Site stewardship shall involve the following activities:

1. Removal of non-native, invasive English ivy, cherry laurel, English holly, and Himalayan blackberry (*Rubus armeniacus*). All English ivy stems and roots shall be pulled and hand-grubbed from the stewardship areas. English ivy can resprout if roots are not adequately removed. All non-native cherry laurel and English holly bushes or small trees shall be cut down very low to the ground and the freshly cut stumps shall be hand-painted with a systemic stump killer herbicide. Stump killing herbicides must be applied by direct application to the cut areas and should not be applied by aerial spraying. Root ball removal of English holly and cherry laurel is not recommended as these areas are sloped and removal would require significant effort. Killing stumps systemically allows them to decompose in place with minimal soil disturbance.

The King County Noxious Weed program provides detailed guidance on identification and Best Management Practices (BMPs) for all listed and many unlisted noxious weeds. The County's recommendations for removal of Himalayan blackberry, English holly, and English ivy can be found here: https://kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/weed-control-practices.aspx.

2. Native plants shall be installed on either side of the proposed driveway within two, approximately 5-foot-wide landscaping strips as indicated on **Appendix B/Plan Sheet 1**. Landscaping with native plants in this location is not specifically meant to mimic natural, forested conditions as this will be

a linear travel corridor. Native landscaping in these areas does result in an improvement in ecological conditions within the setback area. Care in species selection and placement must be taken to avoid hazards, excessive maintenance issues, or inadvertent damage to vegetation along the driveway.

Table 3 provides a recommended species and quantities list for the two proposed Stewardship/Native Plant Landscaping Areas.

Table 3. Suggested Plant Palette for the Piped Watercourse Setback Stewardship Areas.

Common Name	Latin Name	Size	Quantity
Indian plum	*Oemleria cerasiformus*	1 gal.	6
Common snowberry	*Symphoricarpos albus*	1 gal.	6
Western sword fern	*Polystichum munitum*	1 gal.	35
		Total number of plantings	**47**

The planting strategy is to plant shrubs in the outer half of these stewardship zones, and sword ferns on the interior half closest to the driveway/access road areas or on any steeper slope sections.

3. Once plantings have been installed within the Stewardship/Native Landscaping Areas, either a composted mulch or arborist chip mulch shall be applied to all remaining areas of bare ground. Mulch shall be applied 4-6 inches thick to reduce the germination of English holly and other weed seeds, to reduce erosion, and help retain moisture for the plantings. Apply mulch with care not to cover up the base (root crown) of shrubs as this will potentially kill them.

Refer to Tree Solutions Inc.'s planting plan sheets for BMPs on general planting techniques and for planting on slopes. In general, dig a hole with a slight well around it and always keep the plant level (do not plant at an angle). Providing a soil well or saucer-shaped soil surface around plantings on slopes will allow water to collect and penetrate into the rooting zone rather than run down the slope.

Disclaimer

Convergent Ecosystems has prepared this Critical Areas Report at the request of Edward and Catherine Moran. The information contained herein is, to our knowledge, correct and accurate. It should be recognized that the establishment of stream and wetland boundaries is an inexact science. Rivers and streams are subject to weather patterns, in addition to upstream and downstream activities. Wetlands are, by definition, transition areas, and wetland boundaries often change with time. The presence of wetland indicators may also vary depending on the time of year. Additionally, individual professionals may disagree on the precise location of wetland boundaries and/or the functions and values of a wetland. All stream and wetland boundaries, classifications, and buffer widths should be considered subject to change until reviewed and approved by the appropriate regulatory agencies with jurisdiction. Convergent recommends obtaining jurisdictional approval before completing final site plans and/or beginning construction activities. Final determination of U.S. federal jurisdiction is the responsibility of the U.S. Army Corps of Engineers (USACE), Seattle District. Wetlands considered to be "Waters of the State" are regulated by Washington State, and jurisdiction is determined by the Washington State Department of Ecology (DOE). Based on USACE and DOE final determinations, wetland buffer and mitigation requirements must follow Grays Harbor County code requirements. This report is not intended for use in the application for state and/or federal permits unless otherwise noted. Convergent is not responsible for the accuracy of information provided by others.

Within the limitations of schedule, budget, and scope of work, Convergent warrants that this study was conducted in accordance with generally-accepted environmental science practices, including the technical guidelines and criteria in effect at the time of this study. The results and conclusions of this report represent the author's best professional judgment based upon information provided by the project proponent and information obtained during the course of this study. No other warranty, expressed or implied, is made.

In the event of any changes in the nature, design, or locations of the project site features, the conclusion and recommendations in this report would not be valid unless the changes are reviewed and the conclusions of this report are verified in writing with Convergent. Convergent is not responsible for any claims, damages or liabilities associated with the interpretation of these findings or reuse of the analysis without the express written authorization of Convergent.

Convergent and project staff are not attorneys, and this report should not be construed to be a legal representation or interpretation of environmental laws, rules, or regulations.

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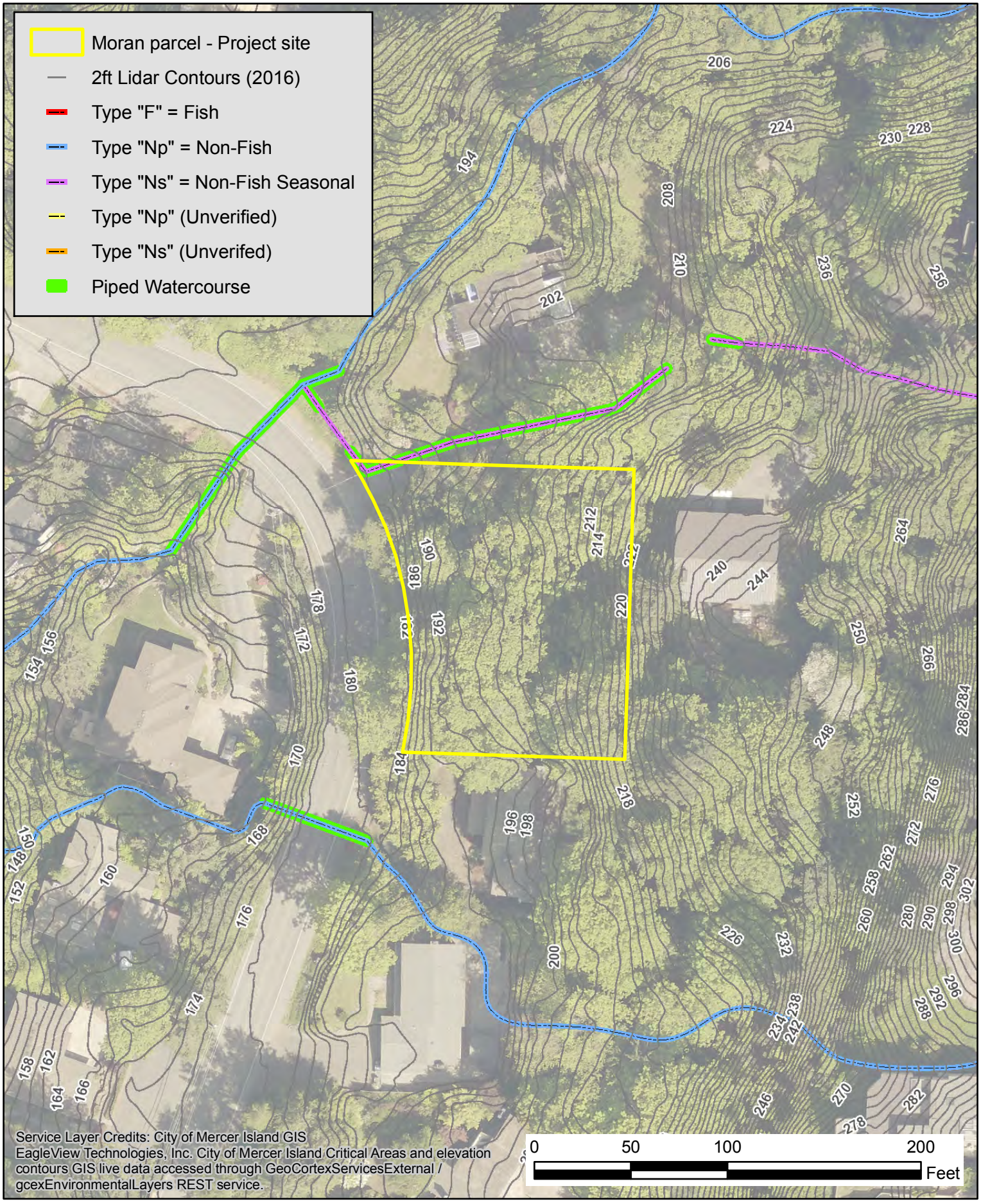
APPENDIX A

CONVERGENT ECOSYSTEMS

FIGURE 1: VICINITY MAP
Moran Property, Mercer Island, WA

N

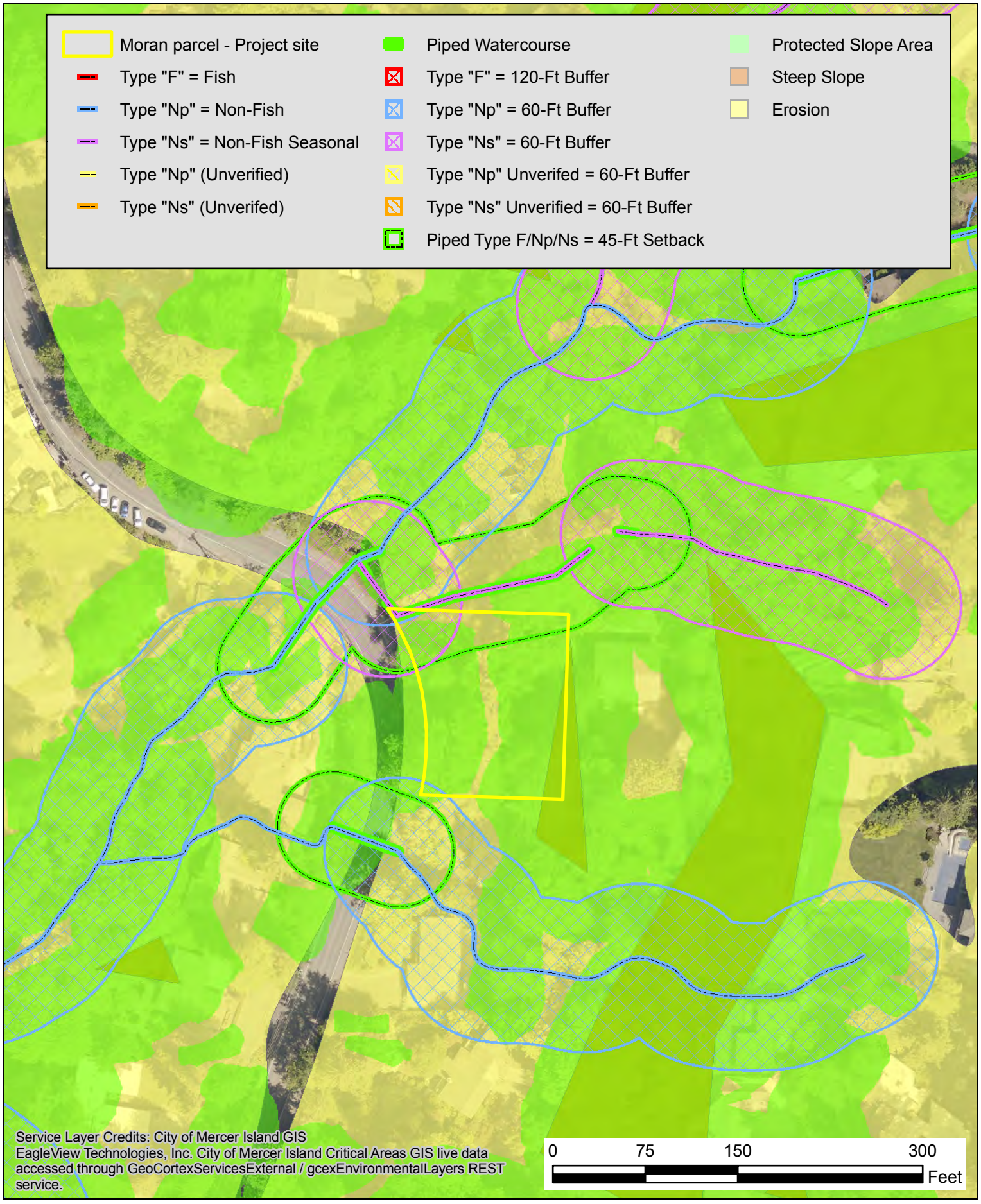


CONVERGENT ECOSYSTEMS

FIGURE 2: SITE TOPOGRAPHY AND DRAINAGE
Moran Property, Mercer Island, WA

CONVERGENT ECOSYSTEMS

FIGURE 3: NATIONAL WETLAND INVENTORY
Moran Property, Mercer Island, WA

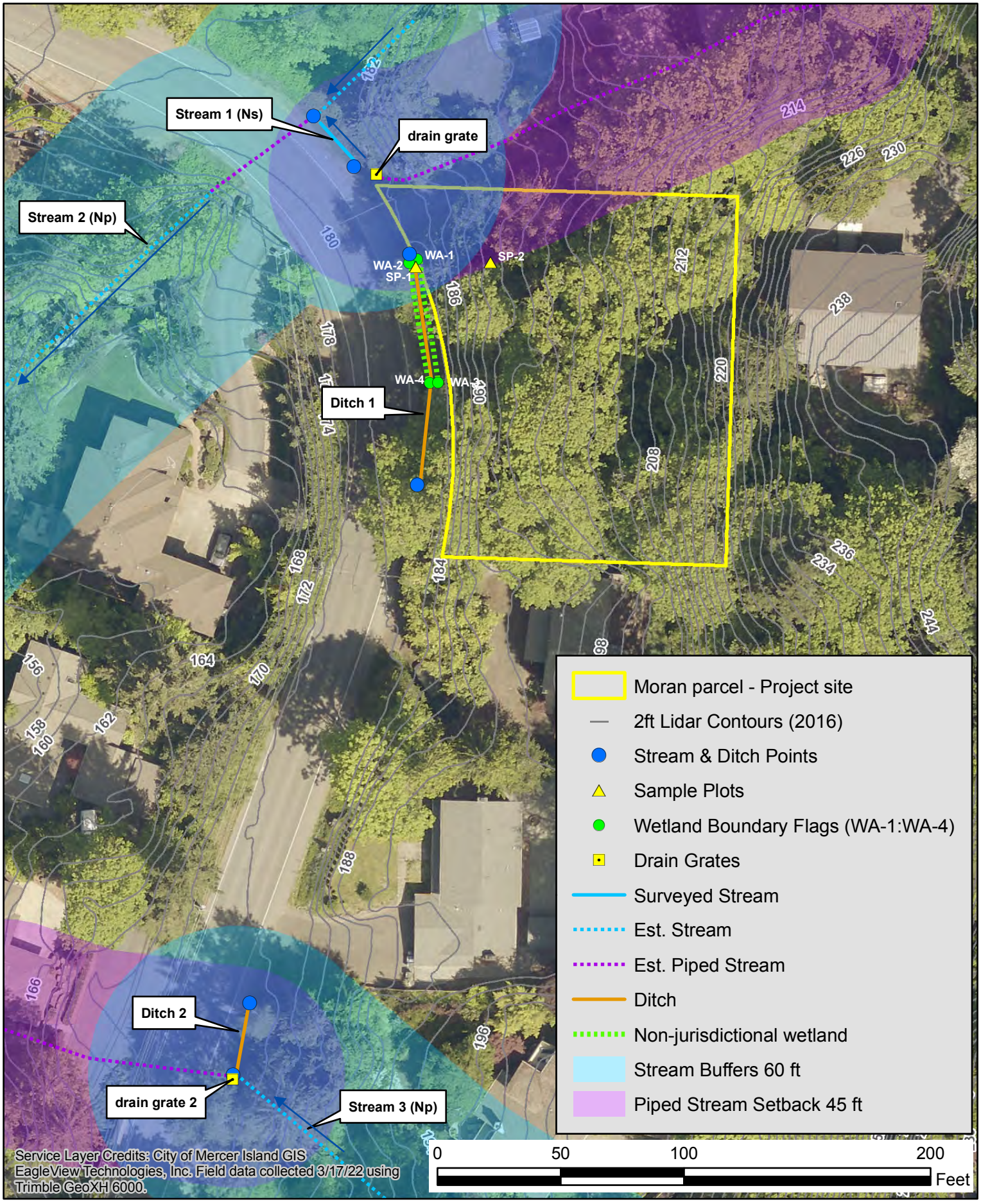


CONVERGENT ECOSYSTEMS

FIGURE 4: CITY OF MERCER ISLAND CRITICAL AREAS MAPPING
Moran Property, Mercer Island, WA

CONVERGENT ECOSYSTEMS

FIGURE 5: NRCS SOIL SURVEY
Moran Property, Mercer Island, WA



CONVERGENT ECOSYSTEMS

FIGURE 6: CRITICAL AREAS EXISTING CONDITIONS
Moran Property, Mercer Island, WA

N

APPENDIX B

EXISTING TYPE 1 CATCH BASIN

EST. PIPED STREAM

STREAM 1 (Ns)

STREAM 2 (Np)

EXISTING PRIVATE ACCESS ROAD

STREAM 1 15' BUFFER

10' BSBL

15'

10'

45'

DRAIN GRATE

EXISTING TYPE 1 CATCH BASIN

EXISTING OVERHEAD POWER

EXISTING TRENCH DRAIN

MATCH TO EXISTING GRAVEL ROAD

NON-JURISDICTIONAL WETLAND A

W MERCER WAY

DITCH 1

EXISTING OVERHEAD POWER

SP-1

SP-2

PIPED STREAM 45' BUFFER

SLOPE BUFFER (TYP.)

PROPOSED GARAGE

PROPOSED HOUSE 2,664 SF

LANDSCAPING

STEWARDSHIP/NATIVE LANDSCAPING AREA (363 SF)

PROPOSED CONCRETE DRIVEWAY WITH A BRUSHED FINISH SURFACE

DETENTION SYSTEM CONTROL STRUCTURE

22' x 4' DETENTION TANKS

PROPOSED CONCRETE DRIVEWAY

RETAINING WALL

PARCEL #1924059244 0.41 ACRES

SLOPE BUFFER (TYP.)

0 20 40

SCALE FEET

LEGEND

- PROJECT BOUNDARY
- DELINEATED STREAM
- ESTIMATED STREAM
- ESTIMATED PIPED STREAM
- DITCH
- NON-JURISDICTIONAL WETLAND
- PIPED STREAM 45' SETBACK AREA
- STEWARDSHIP/NATIVE LANDSCAPING AREA
- DELINEATED STREAM BUFFER
- TREE TO BE REMOVED
- TREE TO BE PRESERVED
- FLOW DIRECTION

N

SCALE

DATE 03/30/2022

DRAWING TITLE
PROPOSED DEVELOPMENT, IMPACTS, AND MITIGATION

CLASS\SHEET SHEET OF
SHEET 1

MORAN PROPERTY

REV: | DATE: | DESCRIPTION: | BY:

DRAWN: JZ | CHECKED: RB | APPROVED: RB

PROJECT # 21-123 | CLIENT: MORAN | LOCATION: MERCER ISLAND, WA

ENVIRONMENTAL CONSULTING AND DESIGN
Burien, WA
TEL: 206.909.3575
CONVERGENT ECOSYSTEMS

APPENDIX C

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

Project Site: Moran Property City/County: Mercer Island/ Sampling Date: 3/17/2022
Applicant/Owner: Edward and Catherine Moran State: WA Sampling Point: SP-1 (Wetland)
Investigator(s): Rosemary Baker Section, Township, Range: S19/T24N/R5E
Landform (hillslope, terrace, etc.): depression/drainage ditch Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): A Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Alderwood gravelly sandy loam NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Hydric Soil Present?	Yes	☒	No	☐	
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: Data plot within north end of drainage ditch along East side of West Marginal Way. Thick, dark soils in this slightly wider portion of Wetland A/Ditch 1 that were super saturated and appeared mucky but with lots of fine mineral deposition and undecomposed sticks and leaves throughout.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 5 m.r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m.r.)			
1. *N/A*			
2.			
3.			
4.			
5.			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size: 1 m.r.)			
1. *Equisetum telmateia*	48	yes	FACW
2. *Hedera helix*	15	no	
3. *Solanum dulcamara*	2	no	
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
50% = _____, 20% = _____	65	= Total Cover	
Woody Vine Stratum (Plot size: 5 m.r.)			
1. *N/A*			
2.			
50% = _____, 20% = _____		= Total Cover	

% Bare Ground in Herb Stratum 45

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Horsetails observed growing 1-2 feet on eastern side slope of drainage ditch indicating some minor groundwater inputs to Ditch 1. Veronica americanum, Epilobium watsonii, and Ranunculus repens also encountered within Wetland A (outside of SP 1).

Project Site: Moran Property

SOIL Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 2/1	100					muck	w/lots of undecomposed litter and fine silts
15+	2.5 Y 4/1	100					SSM	(silty sandy muck)

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Bottom layer of soil too soft/too saturated to excavate beyond 15 inches. Likely there is a more firm mineral layer below 16" - a firmer mineral layer was encountered at increasingly shallower depths within Ditch 1 moving further south.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☒	No	☐	Depth (inches):	2"
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	surface

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Wetland feature is not historic. It is located within Ditch 1 and constructed for drainage along West Mercer Way. It has formed in this location from decades of stormwater directed to it from an adjacent driveway access road and silt/litter deposition. Wetland A is within the lowest portion of Ditch 1 and does not appear to drain frequently. Wetland A appears to very slowly infiltrate stormwater in place.

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

Project Site: Moran Property City/County: Mercer Island/ Sampling Date: 3/17/2022
Applicant/Owner: Edward and Catherine Moran State: WA Sampling Point: SP-2 (Upland)
Investigator(s): Rosemary Baker Section, Township, Range: S19/T24N/R5E
Landform (hillslope, terrace, etc.): upland hillslope Local relief (concave, convex, none): convex Slope (%): 15
Subregion (LRR): A Lat: ____ Long: ____ Datum: ____
Soil Map Unit Name: Alderwood gravelly sandy loam NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks: Data plot within upland forested slope east of SP-1.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 5 m.r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophylllum*	40	yes	FACU
2. *Ilex aquifolium*	40	yes	FACU
3. *Prunus laurocerasis*	25	yes	NL (UPL)
4. ____	____	____	____
50% = ____, 20% = ____	105	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m.r.)			
1. *Prunus laurocerasis*	5	yes	NL (UPL)
2. *Rubus spectabilis*	5	yes	FAC
3. ____	____	____	____
4. ____	____	____	____
5. ____	____	____	____
50% = ____, 20% = ____	10	= Total Cover	
Herb Stratum (Plot size: 1 m.r.)			
1. *Polystichum munitum*	10	yes	FACU
2. *Hedera helix*	5	yes	FACU
3. ____	____	____	____
4. ____	____	____	____
5. ____	____	____	____
6. ____	____	____	____
7. ____	____	____	____
8. ____	____	____	____
9. ____	____	____	____
10. ____	____	____	____
11. ____	____	____	____
50% = ____, 20% = ____	15	= Total Cover	
Woody Vine Stratum (Plot size: 5 m.r.)			
1. *Hedera helix*	20	yes	FACU
2. ____	____	____	____
50% = ____, 20% = ____	20	= Total Cover	

% Bare Ground in Herb Stratum 85

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	7	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	14	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: English ivy on trees and on the ground

Project Site: Moran Property

SOIL

Sampling Point: SP-2 (Upland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/2	100					sandy loam	more organic content/duff/roots
7-12	10R 2/2	100					sandy loam	small gravels/no organics or litter
12-16+	10YR 3/4	100					FLS	(fine loamy sand)

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: Soils dry and crumbly