CRITICAL AREA STUDY

FOR

Zhang Property – Tax ID 1438700145
City of Mercer Island, WA

Wetland Resources, Inc. Project #21016

Prepared By
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Prepared For
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First Submittal: July 19, 2021
Revision 1: February 22, 2022

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Executive Summary

Project Name: Zhang SFR – Tax ID 1438700145

Location: The subject property has no assigned address. The parcel is located southwest of the southern terminus of an unnamed private drive. The private drive is accessed via E Mercer Way and SE 54th Street. The parcel is located immediately south of 9425 SE 54th St, and between 9419 SE 54th St and 5425 96th Ave SE, in the city of Mercer Island.

Client:
Zhang Bin
5425 96th Ave SE
Mercer Island, WA 98040

Property Owner:
Same as client

Wetland Resources Staff: Niels Pedersen, PWS (Senior Ecologist) and Eamonn Collins (Associate Ecologist).

Critical Areas Determination: Observed critical areas within the subject property include one watercourse (Stream A). Stream A is a Type Np watercourse that requires a 60-foot protective buffer. Critical areas in nearby off-site areas include Lake Washington. Lake Washington is at no point closer than 240 feet from the subject property.

Proposed Project: The applicant proposes to remove an existing garage from the buffer of Stream A. The area will be revegetated.

1.0 INTRODUCTION

1.1 PROJECT LOCATION

Basin: Puget Sound
Sub-Basin: Water Resource Inventory Area (WRIA) 8 – Cedar/Sammamish River
Watershed: Lake Washington
Sub-Watershed: Mercer Island

The proposed project occurs within a 0.50-acre parcel with no assigned address. *Wetland Resources, Inc*. (WRI) performed a site investigation on February 3, 2021. The purpose of the site visit was to identify critical areas on and near the property.

Access to the site is from the north via SE 54th Street. Vegetation within the subject property consists of typical native Puget Lowlands second-growth forest species, with the exception of English ivy dominance in the understory. The northern one-third of the property is a relatively steep southeast-aspect slope that breaks to flat in the center one-third of the property. The southern one-third of the property is a relatively steep northeast-aspect slope.

The terminus of the unnamed private road extends into the northeast corner of the property and provides access to an existing garage. Stream A flows from west to east through the center of the parcel. No wetlands were observed on or near the property.

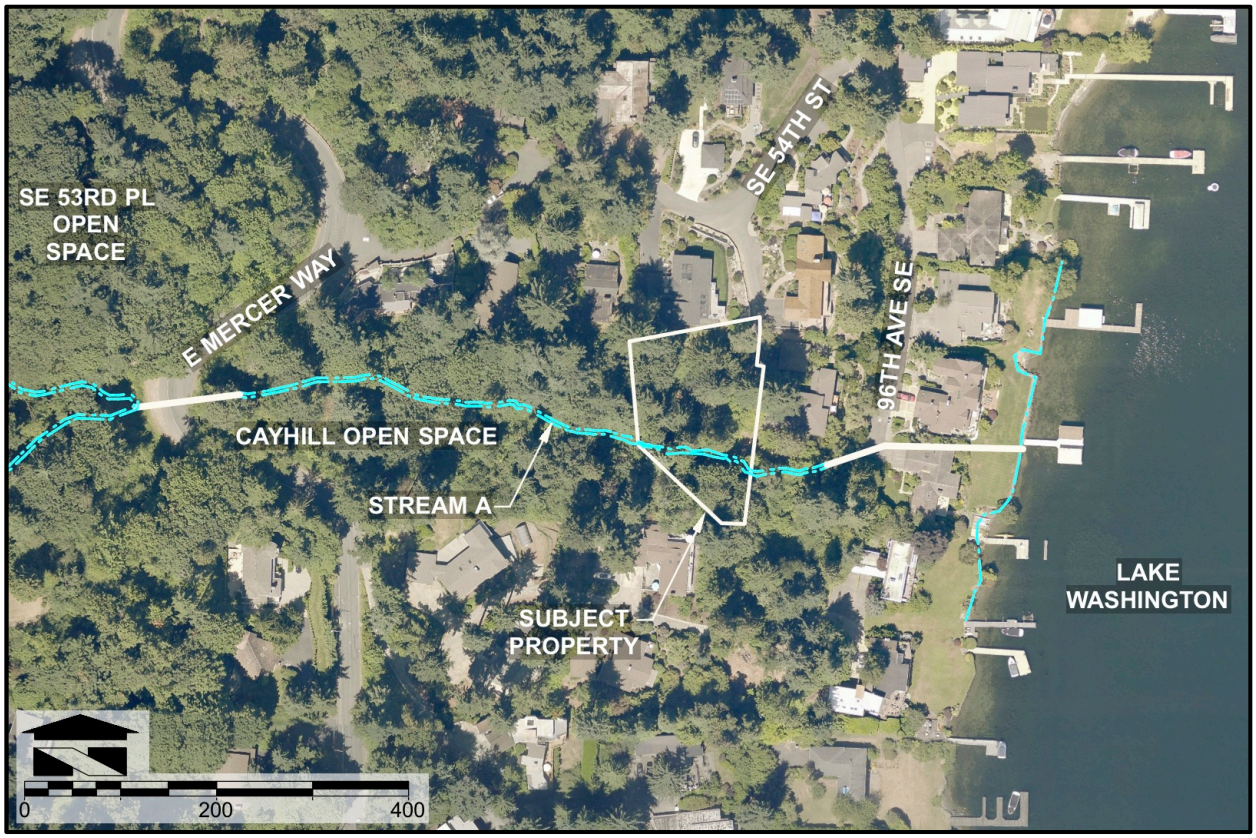

Figure 1: Aerial Overview Map (image source: King County)

1.2 PROJECT DESCRIPTION

The applicant is proposing to remove the existing on-site garage. The garage is currently located in the buffer of Stream A. The footprint of the existing garage will be restored by installing native vegetation. Details regarding the revegetation plan are below in Section 4 of this report.

This report is intended to support a Type 2 Critical Area Review.

2.0 CRITICAL AREAS DELINEATION METHODOLOGY

2.1 LIMIT OF STUDY

The proposed project occurs within one 0.50-acre parcel. Lack of legal access to nearby parcels prevents Wetland Resources, Inc. (WRI) staff from performing routine wetland and ordinary high water mark (OHWM) determinations in off-site areas. Critical area boundaries depicted outside of the subject property/right-of-way are estimated using best professional judgment and visual observation from the edge of legal access.

2.2 GENERAL CRITICAL AREAS CLASSIFICATION

Critical areas were classified in accordance with the standards set forth in section 19.07.180 of the Mercer Island City Code (MICC) for watercourses, section 19.07.190 for wetlands, 19.07.170 for fish and wildlife habitat conservation areas, and 19.13 for shoreline areas. Identification of geologic hazard areas is beyond the scope of this report. Buffers are measured horizontally in a landward direction from the critical area boundary.

2.3 WETLAND DELINEATION METHODOLOGY

Wetland boundaries were determined using the routine determination approach described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (U.S. Army Corps of Engineers 2010), as required by MICC 19.07.080(A). Under the routine methodology, the process for making a wetland determination is based on three steps:

1.) Examination of the site for hydrophytic vegetation (species present and percent cover);
2.) Examination of the site for hydric soils;
3.) Determining the presence of wetland hydrology

The following criteria must be met to make a positive wetland determination.

Vegetation Criteria

The Corps Manual and 2010 Regional Supplement define hydrophytic vegetation as "*the assemblage of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence.*" Field indicators are used to determine whether the hydrophytic vegetation criteria have been met. Examples of these indicators include, but are not limited to, the rapid test for hydrophytic vegetation, a dominance test result of greater than 50%, and/or a prevalence index score less than or equal to 3.0.

Soils Criteria
The 2010 Regional Supplement (per the National Technical Committee for Hydric Soils) defines hydric soils as soils *"that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."* Field indicators are used to determine whether a given soil meets the definition for hydric soils. Indicators are numerous and include, but are not limited to, presence of a histosol or histic epipedon, a sandy gleyed matrix, depleted matrix, and redoximorphic depressions.

Hydrology Criteria
Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on the characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively. The strongest indicators include the presence of surface water, a high water table, and/or soil saturation within at least 12 inches of the soil surface.

2.4 WETLAND DETERMINATION DISCUSSION
No wetlands were observed within the subject property during the February site visit. The absence of hydrology outside the banks of Stream A during a very wet period, and the general absence of vegetation suited to wet conditions strongly supports the non-wetland determination. Additionally, soils throughout the site were very sandy, and consistent with upland conditions (due to observed high-chroma soils).

2.5 OHWM DELINEATION METHODOLOGY
The OHWM of Stream A was determined based on the Ecology guidance document titled *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. Stream boundaries in off-site areas are based on mapping provided in the City of Mercer Island GIS Portal.

2.6 WILDLIFE HABITAT CONSERVATION AREA DISCUSSION
Areas used by bald eagles for nesting, breeding, feeding and survival are designated by the City of Mercer Island as wildlife habitat conservation areas. No known bald eagle nests are located in the vicinity of the subject property based on visual inspection during the February site visit.

3.0 WETLAND AND STREAM DELINEATION REPORT

WRI was contracted by Zhang Bin to delineate and catalogue regulated features on and near the subject property. No wetlands were observed in the study area. Two regulated features were observed. One Type Ns watercourse (Stream A) was identified on the subject property, and Lake Washington was observed approximately 250 feet east of the parcel. These features are depicted in the attached critical area study map (See Appendix C). Lake Washington is a shoreline of statewide significance that requires a 25-foot structure setback from the OHWM (survey-based, 18.6' NAVD 88). Stream A is a Type Ns stream that requires a 60-foot protective buffer.

3.1 REVIEW OF EXISTING INFORMATION

Prior to conducting the on-site investigations, public resources information was reviewed to gather background information on the project study area and surrounding areas regarding wetlands, streams, and other critical areas.

USFWS National Wetlands Inventory

The National Wetlands Inventory (NWI) identifies a riverine wetland in the location where Stream A was observed on the site. An additional off-site stream is mapped approximately 350 feet north of the site.

King County Soils

The Natural Resources Conservation Service (NRCS) web soil survey and the 2014 national hydric soil list by state were used to identify soil types in the project area. Kitsap silt loam, 15 to 30 percent slopes, is the only mapped soil type in the project area. The following table describes the hydric component percentage found in the mapped soil type. The likelihood that a given map unit is a hydric soil is partly based on the percentage of hydric components found in the soil type.

Map Unit Name	Hydric Component	Component Percentage
Kitsap silt loam, 15 to 30 percent slopes	Bellingham	1
	Tukwila	1
	Seattle	1

Table 1: Mapped Soils in the Project Area

Fish Presence

The Washington Department of Fish and Wildlife (WDFW), Pacific States Marine Fisheries Commission (PSMFC), and the Washington Dept. of Natural Resources (WADNR) are the primary agencies that provide publicly available information used for making fish presence determinations consistent with the water typing rules set forth in WAC 222-16-030. The following information represents the findings from each source.

WDFW SalmonScape Map Tool

SalmonScape is an online GIS database that contains publicly available resource information for fish population studies and general species distribution (both documented and modeled presence). SalmonScape identifies Stream A as a seasonal non-fish bearing stream that outlets to Lake Washington. Within Lake Washington, the following species are depicted:

- fall chinook (documented presence),
- coho salmon (documented presence),
- winter steelhead trout (documented presence),
- sockeye salmon (documented presence),
- bull trout (documented rearing),
- kokanee salmon (documented presence),

PSMFC StreamNet Map Tool

StreamNet is a fish distribution database maintained by the PSMFC as a regional clearinghouse for fish data. In the vicinity of the project area, fish presence is only depicted within Lake Washington. StreamNet states the presence of the following species:

- fall chinook (migration only)
- summer chinook (spawning and rearing)
- coho salmon (migration only)
- chum salmon (migration only)
- pink salmon (migration only)
- sockeye salmon (migration only)
- summer steelhead trout (migration only)
- winter steelhead trout (migration only)
- bull trout (migration only)

WDNR Forest Practices Activity Mapping Tool (FPAMT)

FPAMT is an online GIS database that aids the process of submitting a Forest Practices Permit application. The tool is useful for the purposes of this study because WADNR models fish presence. Stream A is depicted by FPAMT as an untyped watercourse.

City of Mercer Island Critical Areas

The City of Mercer Island depicts the on-site stream as a Type Np watercourse. Lake Washington is mapped approximately 280 feet east of the site.

WDFW Priority Habitat and Species (PHS) Maps

WDFW PHS identifies the Southeast 53rd Place Open Space as a priority terrestrial habitat approximately 330 feet west of the site. This resource does not identify Stream A.

3.2 WATERCOURSE DETERMINATION FINDINGS

Stream A

Jurisdiction: City of Mercer Island
Cowardin Class: Riverine, Intermittent, Streambed
Watercourse Type (MICC): Ns
City of Mercer Island Standard Buffer Requirement: 60 feet

Stream A is a narrow, slightly down-cut stream that flows eastward through the center of the subject site. Two tributaries to Stream A originate west of East Mercer Way in the Southeast 53rd Place Open Space. At the confluence of the tributaries, Stream A is culverted beneath East Mercer Way and outflows into the Cayhill Open Space property. The stream flows along the north boundary of Cayhill Open Space until it enters the subject property from the west.

The on-site portion of Stream A forms at the base of a broad ravine that slopes east towards Lake Washington. The stream channel varies between narrow, channelized areas and shallow braided areas where the stream temporarily broadens. Stream A meanders to the east through the subject property channel along the topographic low point of the ravine before discharging onto the adjacent parcel to the east (5425 96th Ave SE).

The stream flows for approximately 85 feet off-site to the east before entering a 12-inch concrete culvert. The culvert conveys Stream A for approximately 205 feet before discharging directly to Lake Washington near the common boundary between the properties located at 5428 SE 54th Street and 5436 SE 54th Street. The culvert travels beneath improved surfaces that include the terminus of SE 54th Street and the access driveway to 5436 SE 54th Street, and just north of the foundation of the primary structure located at 5436 SE 54th St.

A basin analysis of Stream A and the surrounding area indicates that the majority of water within the basin originates from open spaces on either side of East Mercer Way. Stormwater generated to the north and south of the Cayhill and Southeast 53rd Place Southeast Open Spaces is directed into municipal stormwater facilities. Sediment in and around the on-site portion of Stream A is very sandy, which indicates high infiltration capacity during precipitation events. Sandy soils are also relatively erosive and have led to several highly channelized areas. No signs of overbank flooding were observed during the February 2021 site visit.

Stream classification is described in MICC 19.07.180 as either: Type S, F, Np, Ns, or piped. MICC 19.16.010 provides a specific definition for each of the aforementioned types. To meet criteria for designation as a Type F watercourse, a "natural channel" must "contain fish habitat. Fish habitat is defined in MICC 19.16.010 as follows:

> *Habitat which is used by any fish at any life stage at any time of the year, including potential habitat likely to be used by fish which could be recovered by restoration or management and includes off-channel habitat.*

It is the applicant's position that Stream A does not meet criteria for designation as a Type F watercourse because it does not contain fish habitat. This assertion is based on the physical separation between known fish-bearing waters (Lake Washington) and the subject property by 205 linear feet of culvert, and the improbability of non-anadromous fish use in Stream A (upstream of the subject property).

The culvert precludes "use by any fish at any life stage at any time of the year" due to its physical characteristics. The piped section of the culvert could not reasonably be "recovered by restoration" for several reasons. From a legal standpoint, the owners of the subject property cannot daylight the piped watercourse because they do not own the properties where the culvert is located. From a practical standpoint, the owner of 5436 SE 96th Ave SE would be affected by increased safety risk and property devaluation (due to reduced recreational use), and such a proposal may result in environmental damage (i.e. diminished water quality due to proximity to residential use and landscaping practices).

There are no known waterbodies that would support non-anadromous fish upstream of the subject property. Two tributaries to Stream A are mapped west of East Mercer Way. The streams originate within the Southeast 53rd Place Open Space and are mapped as Type Np streams by the City of Mercer Island. Topography within the tributary channels varies between 20 and 50 percent slopes based on publicly available lidar. These physical conditions do not support the life history of any known fish. As such, Lake Washington would be the only potential source of fish within Stream A.

In summary, Stream A is not accessible to fish in its current condition. The culvert separating the on-site portion of Stream A from Lake Washington precludes fish from accessing the site from the east, and upstream conditions are not supportive of fish usage throughout their life history. Fish usage cannot be recovered by restoration of the downstream area due to the constraints created by existing infrastructure and residential development. Therefore, Stream A is correctly classified as Type Np. This classification is consistent with the City of Mercer Island GIS classification, the 2006 watercourse inventory prepared by Herrera, and the 2020 watercourse inventory prepared by Herrera.

Lake Washington
Jurisdiction: USACE, City of Mercer Island, WDFW, Ecology, DNR
Cowardin Class: Lacustrine, Limnetic, Unconsolidated Bottom
Classification: Shoreline of Statewide Significance
City of Mercer Island Setback Requirement: 25 feet

The shore of Lake Washington is located approximately 250 feet east of the site. Lake Washington is a 21,600-acre waterbody that drains much of WRIA 8. Waterbodies that exceed 1,000 acres in total size are recognized as shorelines of statewide significance (WAC 173-20). The area extending 200 feet from the ordinary high water mark of Lake Washington is considered the shoreland area, and development within this zone is subject to the provisions of the Mercer Island Shoreline Master Program (MICC 17.09.110). In Mercer Island, Lake Washington requires a 25-foot structure setback, measured from elevation 18.6' (NAVD 88). The subject property is located outside of shoreline jurisdiction.

Lake Washington provides habitat for many aquatic species, including: bull trout, pink salmon, sockeye salmon, summer steelhead, winter steelhead, chum salmon, coho salmon, fall Chinook, and summer Chinook. Lake Washington is a primary association area for federally listed threatened and endangered species (chinook, steelhead, and bull trout).

4.0 BUFFER RESTORATION PLAN

4.1 REMOVAL OF EXISTING STRUCTURE

The applicant is proposing to remove an existing garage located within the buffer of Stream A. The removal of structures within watercourse buffers is allowed per MICC 19.07.130.4. Text from the code is below in italics with WRI answers following in standard text.

4. Demolition. Removal of structures in watercourse and wetland buffers and geologically hazardous areas, provided:
a. Site disturbance is limited to the existing access and building footprint;

Site disturbance related to removal of the garage will be limited to the existing structural footprint.

b. There is no site disturbance within or to wetlands or watercourses;

No disturbances are proposed within wetlands or streams.

c. All soils are stabilized and the area is revegetated with appropriate native vegetation; and

Appropriate measures will be taken to stabilize soils prior to removing the garage. Once removed, the area will be revegetated with native plants similar to observed on-site vegetation. The planting plan is below in Section 4.2.

d. Necessary building permits are obtained.

The applicant will obtain the necessary building permits prior to site disturbance.

4.2 BUFFER RESTORATION PLAN

MICC 19.07.130.4 requires the revegetation of previously disturbed areas following demolition of structures within stream buffers. A total of 696 square feet of buffer restoration is proposed in the footprint of the existing garage. Restoration plantings have been designed to mimic native on-site vegetation. The restoration planting plan is as follows:

Common Name	Scientific Name	Size	Spacing	Quantity
Western red cedar	*Thuja plicata*	1 gallon	10'	6
Vine maple	*Acer circinatum*	1 gallon	5'	7
Salmonberry	*Rubus spectabilis*	1 gallon	5'	7
Oso berry	*Oemleria cerasiformis*	1 gallon	5'	7
Sword fern	*Polystichum munitum*	1 gallon	5'	5

Table 2: Buffer Revegetation Planting Plan (696 Square Feet)

Monitoring is not proposed for the restoration plantings. MICC 19.07.080.C.1 states "*Maintenance and monitoring shall be required for at least five years from the date of project completion if the code official determines such condition is necessary to ensure mitigation success and critical area protection.*" The restoration plantings are not part of a mitigation plan and therefore maintenance and monitoring are not required.

5.0 USE OF THIS REPORT

This Critical Area Study is supplied to Zhang Bin as a means of determining critical area conditions, as required by the City of Mercer Island during the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Niels Pedersen
Senior Ecologist, PWS

Wetland Resources, Inc.

Eamonn Collins
Associate Ecologist

REFERENCES

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRPDE-4. US Army Engineers Waterways Experiment Station, Vicksburg, MS.

Cowardin, L.M., V. Carter, F.C. Golet and E.T. Laroe. 1979. Classification of Wetlands and Deep Water Habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS 79/31.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. Environmental Laboratory, Department of the Army, Corps Waterways Experiment Station, Vicksburg, MS.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Washington State Dept. of Ecology Publication No. 14-06-029. Olympia, WA.

Lichvar, R.W, D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1–17. Published April 28, 2016. ISSN 2153 733X.

Munsell Color. 2012. Munsell® Soil Color Book. Munsell Color, Grand Rapids, MI.

NOAA National Weather Service Forecast Office, Seattle, Washington. <http://www.weather.gov/climate/index.php?wfo=sew>.

Olson, P. and E. Stockdale. 2010. Determining the Ordinary High Water Mark on Streams in Washington State. Second Review Draft. Washington State Department of Ecology, Shorelands and Environmental Assistance Program. Lacey, WA. Ecology Publication # 08-06-001.

StreamNet. 2014. StreamNet Mapper. http://www.streamnet.org/mapping_apps.cfm. Accessed February 2022.

U.S. Army Corps of Engineers (Corps). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). U.S. Army Engineer Research and Development Center Environmental Laboratory. Vicksburg, MS. Publication # ERDC/EL TR-10-3.

U.S. Fish and Wildlife Service. National Wetland Inventory (NWI). Wetlands Mapper. http://www.fws.gov/wetlands/. Accessed February 2022.

Washington State Department of Fish and Wildlife (WDFW). 2011. SalmonScape. (http://wdfw.wa.gov/mapping/salmonscape/index.html). Accessed February 2022.

Washington State Department of Fish and Wildlife (WDFW). 2013a. Threatened and Endangered Wildlife in Washington: 2012 Annual Report. Listing and Recovery Section, Wildlife Program, Washington Department of Fish and Wildlife, Olympia, WA. 251 pp.

Washington State Department of Fish and Wildlife (WDFW). 2013b. Priority Habitats and Species: PHS on the Web. (http://wdfw.wa.gov/mapping/phs/). Accessed February 2022.

APPENDIX A:
CRITICAL AREA STUDY MAPS (SHEETS 1 - 2)

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CRITICAL AREA STUDY MAP - EXISTING CONDITIONS

ZHANG PROPERTY - K.C. TAX ID 1438700145

PORTION OF SECTION 19, TOWNSHIP 24N, RANGE 5E, W.M.

ON-SITE PORTION OF STREAM A WAS DELINEATED AND SURVEYED. OFF-SITE PORTION OF STREAM A WAS ESTIMATED USING PUBLICLY AVAILABLE RESOURCES AND BASED ON INTERPRETATION OF THE DIGITAL ELEVATION MODEL.

LEGEND

- STREAM OHWM
- OHWM (ESTIMATED)
- STREAM (PIPED)
- SHORELINE LIMITS
- 60' BUFFER
- 10' BSBL
- PROPERTY BOUNDARY

Scale 1" = 60'

0 30 60 90 120

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Critical Area Study Map
Zhang SFR - K.C. Tax ID 1438700145

Bin Zhang
5425 96th Ave SE
Mercer Island, WA
98040

Sheet 1/2
WRI #: 21016
Drawn by: EC
Rev 1 Date: 2/22/2022

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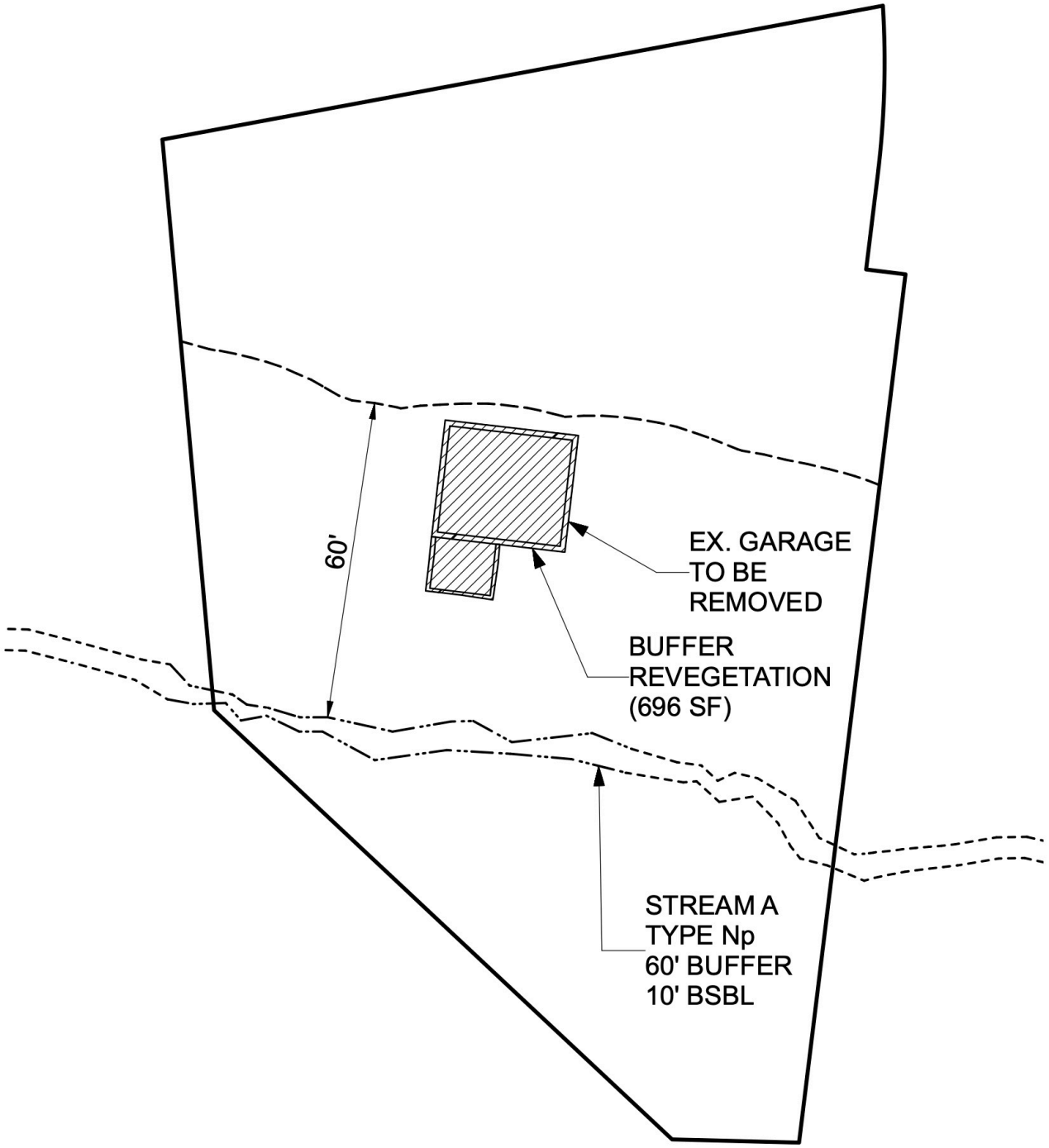
CRITICAL AREA STUDY MAP - PROPOSED DEVELOPMENT

ZHANG PROPERTY - K.C. TAX ID 1438700145

PORTION OF SECTION 19, TOWNSHIP 24N, RANGE 5E, W.M.



LEGEND

- STREAM OHWM
- OHWM (ESTIMATED)
- BUFFER
- BSBL
- BUFFER REVEGETATION

Scale 1" = 30'

0 15 30 45 60

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Critical Area Study Map
Zhang SFR - K.C. Tax ID 1438700145

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Sheet 2/2
WRI #: 21016
Drawn by: EC
Rev 1 Date: 2/22/2022

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