WETLANDS & WILDLIFE
Environmental Consulting

STREAM QUALITATIVE ASSESSMENT REPORT ZHANG PROPERTY AT 7908--53RD AVENUE WEST CITY OF MUKILTEO, WA (PARCEL #00611600004500)

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PROJECT SITE DESCRIPTION

This report is related to real property which is located at 7908--53rd Avenue West in the City of Mukilteo, Washington (located in a portion of Section 09, Township 28N, Range 04E, W.M.). The tax parcel number for the subject property follows: 00611600004500. Based upon information gained from the Snohomish County Assessor's Office, the proposed project site encompasses approximately 3.78 acres. The property is currently owned by *Zhang Family, LLC.*

STATEMENT OF QUALIFICATIONS TO CONDUCT THIS ECOLOGICAL EVALUATION

Per the Mukilteo Municipal Code (MMC) section 17.52C.070.C, "A qualified biologist as defined in Chapter 17.08 shall prepare all reports and studies required of the applicant by this chapter." Therefore, the following provides a brief overview of my experience and credentials to conduct the ecological evaluations on the subject property. I am the Founder, Owner, and Principal Wetland and Wildlife Ecologist of *Wetlands & Wildlife, Inc.* I attended the University of Montana where I graduated cum laude with a degree in Wildlife Biology. As of 2017, I have 16 years of direct experience as a professional Biologist / Ecologist in western Washington and 20 years of overall experience completing natural resource assessments among many different ecosystems across the western United States. I have worked as a professional Biologist / Ecologist for federal, state, and county environmental agencies, as well as several private environmental consulting firms with specialties in wetlands, streams, rivers, lakes, and wildlife habitat. In my 20 years of experience, I have specialized in review of proposed land use and building development permit applications as they pertain to Critical Areas (wetlands, rivers, streams, lakes, and habitats of protected fish and wildlife species), including several years of experience as a Senior Reviewing Ecologist for King County DDES (currently DPER) and a Regulatory Biologist for Snohomish County PDS.

I am listed on several Preferred / Qualified Consultant Rosters throughout western Washington. I am highly experienced with the required U.S. Army Corps of Engineers and Washington State wetland delineation methods. In addition to the wetland delineation certification, I am trained by the Washington Department of Ecology and have 11 years of experience in the use of the required Wetland Rating Form for western Washington (since its inception). I am trained by the Washington Department of Ecology to determine Ordinary High Water Mark (OHWM) locations for rivers, streams, and lakes. In addition to my expertise related to wetlands and streams, I have many years of experience conducting surveys of special-status wildlife species in the western U.S. I received certifications from the Washington Department of Fish and Wildlife for terrestrial wildlife habitat assessments and surveys of special-status wildlife species.

Over the past 20 years, I have conducted over 1,600 biological / ecological assessments in different capacities on properties with many habitat types and zoning designations, from small, urban properties (0.25 acres) to large, rural properties (up to 2,000 acres in size). I have been selected by several local city jurisdictions to provide on-call 3rd-party environmental reviews of proposed development projects for compliance with local Critical Areas Ordinances and the FEMA Floodplain Habitat Assessment and Mitigation document.

PROJECT DESCRIPTION AND DISCUSSION REGARDING CITY OF MUKILTEO REQUIREMENTS

As part of my project evaluation, I reviewed of the Drainage Report dated June 1, 2017 which was prepared by Dave Dougherty, PE of *Site Development Services*. Per information contained in that Drainage Report, "Although the ultimate development will consist of three lots, the current project will only result in the construction of one single family residence. However, all of the access, storm drainage and utilities completed for the single house will also provide for the construction of two more single family residences in the future." The Drainage Report also states the following: "Because the new impervious area is over 5000 square feet, all minimum requirements from the 2014 DOE Surface Water Manual apply, and since the predeveloped impervious is less than 35% of the lot area, the project is classified as "New Development". The site consists of two threshold discharge areas; one flowing to the east and one to the west (see "Basin Map"). Although both paths drain to Puget Sound, they do not converge within 1/4 of a mile. After considerable study and research, it has been decided to direct all site runoff to the west to the BNSF ROW. This requires varying from the recommendations in MR#4, "Preservation of Natural Drainage Systems and Outfalls." Based on this information and the detailed stormwater design analysis by *Site Development Services,* the applicant is proposing to direct all stormwater runoff created by the future project area to the west side of the property and not direct any of the project-related stormwater runoff be directed to the stream that is located near the eastern property boundary.

Wetlands & Wildlife, Inc. was retained by *Zhang Family, LLC* (permit applicant) to conduct a stream qualitative assessment per the request of the City of Mukilteo. As part of a permit review associated with a proposed single-family residence on the property, the City of Mukilteo provided a review comment letter requesting additional project information dated September 19, 2017. Our ecological / stream evaluation is related to Comment #18 in the City's letter dated September 19, 2017 which states that "The City requires a stream qualitative assessment be completed by a stream biologist (or equivalent professional). The assessment report shall evaluate the current stream condition, and its ability to accept project runoff without exacerbating existing stream erosion (if present). Therefore, *Wetlands & Wildlife, Inc.* conducted a site visit to the subject property on October 13, 2017 for the purpose of assessing the on-site conditions. Specifically, we conducted a site visit to examine the ecological conditions among and near a stream located at the base of a steep east-facing slope near the eastern boundary of the subject property.

METHODOLOGIES OF THIS STREAM QUALITATIVE ASSESSMENT

As stated above, *Wetlands & Wildlife, Inc.* conducted a site visit to the subject property on October 13, 2017 for the purpose of examining and evaluating the ecological conditions among and near a stream located at the base of a steep east-facing slope near the eastern boundary of the subject property. During our site evaluation, we visually examined for many of the assessment elements outlined in the Stream Visual Assessment Protocol produced by the United States Department of Agriculture. The assessment elements that we used to visually assess the stream to the east of the subject property follow: channel condition, riparian zone, bank stability, barriers to fish movement, and canopy cover / in-stream cover.

In addition to on-site field evaluations, *Wetlands & Wildlife, Inc.* examined aerial photographs and topographical data (elevation contours) on Snohomish County's Map Portal and the City of Mukilteo Parcel Viewer. The Priority Habitats and Species (PHS) map produced by the Washington Department of Fish

and Wildlife (WDFW) and fish distribution maps produced by the WDFW (SalmonScape), Pacific States Marine Fisheries Commission (StreamNet) and Washington Department of Natural Resources (DNR; Forest Practices Application Mapping Tool [FPAMT]) were also reviewed and evaluated as part of our assessment of the subject stream.

RESULTS AND DISCUSSION REGARDING ECOLOGICAL FUNCTIONS AND VALUES ASSESSMENT

Our ecological functions and values assessments are based on professional opinion developed through past field analyses and interpretations. This assessment pertains specifically to the subject stream system, but is typical for assessments of similar systems throughout western Washington.

A regulated stream is located off-site near the eastern boundary of the subject property (varies in distance off-site, but approximately 35-50 feet east of the eastern property boundary). The stream reach in this location transports hydrology generally from south to north among a defined channel. Based on review of the applicable fish distribution maps, the off-site stream is a non-fish bearing stream which does not provide fish habitat due to a down-stream blockage approximately 650-700 feet north of the NE property corner. Therefore, the on-site stream is considered a Type 4 stream pursuant to Table 1 listed in MMC code section 17.52C.080.A. The stream is considered a high mass wasting stream (H), due to evidence of significant soil erosion along the stream banks and within the stream's channel (incising). Per MMC code section 17.52C.090.1, Type 4H streams typically require a standard buffer width of 75 feet, measured from the OHWM extending horizontally in a landward direction.

Based on review of the City of Mukilteo's Streams and Watersheds Map, the central and western portions of the subject property appear to lie within the Smugglers Gulch Watershed, while the eastern portion of the property and the off-site stream are mapped as being within the Olympic View Watershed. This information is also stated in the project's Drainage Report by *Site Development Services*, as their report states that "The site consists of two threshold discharge areas; one flowing to the east and one to the west..."

Although the stream reach east of the subject property does not provide fish habitat due to a down-stream fish passage barrier, this non-fish bearing reach of the stream does provide important ecological functions to its surrounding environment such as hydrological transport, transport of solids (suspended and dissolved), and important in-stream wildlife habitat features, among other functions. The areas adjacent to the stream (riparian corridor) are increasingly important to manage appropriately as these areas aid in water quality and hydrologic control, resulting in cleaner water entering the down-gradient natural resources (Puget Sound). The stream, any associated riparian wetland areas, and the associated protective buffers provide a very valuable vegetated corridor for many terrestrial wildlife species that rely on the stream and surrounding ecosystem for essential habitat elements. The stream, any riparian wetlands, and associated edge habitats (protective buffer areas) contain resources such as food, water, thermal cover, and hiding cover in close proximity. This vegetated habitat corridor is extremely important for many in-stream and terrestrial wildlife species as the surrounding landscape continues to become increasingly developed and existing intact habitat becomes further fragmented.

Per the information contained in the Stream Visual Assessment Protocol, the list of assessment elements which *Wetlands & Wildlife, Inc.* evaluated for this stream reach follows:

1. Channel Condition
2. Riparian Zone
3. Bank Stability
4. Barriers to Fish Movement
5. Canopy Cover / In-stream Cover

Please see below for results of the site-specific stream qualitative assessment based on the evaluation of the stream assessment elements listed above (corresponding numbers):

1. Channel Condition: The stream reach east of the subject property contains a variable substrate, but primarily contains a mix of cobble-gravel and sand or other fine sediments. The stream channel itself is slightly incised in many visible locations near the subject property. The average channel width near the project site equals approximately 20-25 feet in width between Ordinary High Water Marks (OHWMs). Due in part to the approximate in-stream gradient of 15-20% near the project site, the stream does not meander like an undisturbed stream with a lower gradient would. A combination of factors (up-gradient development, urbanizing location, stormwater pipes on the slopes from nearby properties, etc.) appears to be contributing to downcutting / incising among the stream channel, including active erosion and slope instability among the eastern portion of the proposed project site. The stream also contains undercut banks (lateral cutting) near the OHWMs. Based on our assessment, visible evidence of slope instability and channel instability are present in this stream reach.
2. Riparian Zone: As stated in the Stream Visual Assessment Protocol, "a healthy riparian vegetation zone is one of the most important elements for a healthy stream ecosystem. The quality of the riparian zone increases with the width and the complexity of the woody vegetation within it." The riparian zone / corridor located on both sides of the regulated stream are currently relatively intact, with dense native vegetation in the stream's small floodplain. The stream's floodplain is topographically confined in this area due to steep slopes on both sides of the stream. Therefore, an increase in the stormwater input to this system will likely exacerbate erosion and sedimentation among and near the regulated stream channel and its protective buffer area. The vegetation existing among the riparian zone could be compromised with an increase in project stormwater runoff, and that would lead to a reduction in the recruitment of future organic matter and large woody debris to the stream.
3. Bank Stability: The banks of the stream located east of the property are undercut in many locations, leading to lateral cutting. The banks of stream are actively eroding, in large part due to the instability and soil erosion on the east-facing steep slopes near the stream.
4. Barriers to Fish Movement: Based on review of all available fish distribution websites, the reach of the stream east of the subject property is a non-fish bearing stream. The maps we researched indicate a fish passage barrier being located approximately 650-700 feet north of the NE property corner. Therefore, fish are not able to access this reach of the stream. However, fish downstream of a fishless reach interact with the waters and ecological processes (physical, biological, and chemical) occurring within the non-fish bearing reaches (e.g., downstream movement of sediment, large woody debris, organic matter). Therefore, although the subject stream reach does not contain habitat for fish directly, erosion and sedimentation can and often do still affect down-stream fish habitat.

5. Canopy Cover / In-stream Cover: The canopy cover among the riparian corridor associated with the off-site stream is relatively dense, as seen in the aerial photographs on Snohomish County's Map Portal and the Mukilteo Parcel Viewer. Much of the canopy coverage over the stream results from trees located near the toe of the steep slopes, and many of the trees near the stream are leaning toward the stream due to slope instability. The stream also contains relatively dense overhanging vegetation in close proximity to the stream banks. The overhanging vegetation provides ecological benefits to streams, including shade to maintain cooler water temperatures, future recruitment of organic matter, and future large wood recruitment.

SUMMARY OF ASSESSMENT FINDINGS

Based on the stream qualitative assessment detailed in this report, it is the professional opinion of *Wetlands & Wildlife, Inc.* that the proposed project's stormwater design is the most ecologically appropriate stormwater drainage option for the subject property. The stormwater design prepared by *Site Development Services* proposes to route all stormwater resulting from the proposed project site activities to the west side of the property into a non-regulated ditch (not a regulated stream). Routing additional stormwater to the west side of the property into a ditch will avoid cumulative negative / adverse ecological impacts among the stream channel. The current stormwater drainage proposal appears to be the most ecologically sound alternative for handling project-related stormwater runoff, because the current proposal would avoid an increase in erosion and sedimentation being routed to the subject regulated stream. Due to the significant amount of erosion occurring on the east-facing slope leading toward the stream, an increase in the stormwater input to this system would likely exacerbate erosion and sedimentation among and near the regulated stream channel and its protective buffer area.

Section 2.5.4 Minimum Requirement #4 of the required 2014 Stormwater Manual states in part that "The manner by which runoff is discharged from the project site must not cause a significant adverse impact to downstream receiving waters and downgradient properties." As described above, the stream and riparian corridor located east of the subject property already exhibit signs of significant erosion and instability due to several factors, including active erosion and soil instability among the steep slope among the eastern portion of the property and increasing urbanization and other residential development nearby. The potential adverse impacts associated with routing stormwater toward the stream east of the property would include the construction-related impacts to install a drainage detention system on the steep and unstable slopes. Future erosion and sedimentation caused by directing stormwater onto the steep slopes and toward the off-site stream would adversely affect native vegetation in the short term, but would likely affect long-term recruitment of organic matter and woody debris to the stream.

Section 17.52C.B.1 of the MMC is related to fish and wildlife habitat conservation areas such as the off-site stream states that "The intent of these regulations is to avoid impacts to habitats where such avoidance is feasible and reasonable." As described previously in this report, the proposed stormwater design to route project-related stormwater runoff to the west side of the property is a method of avoiding impacts to the off-site stream located east of the property. Therefore, avoidance of adverse impacts is feasible and reasonable in this case, and the applicant is proposing avoidance as a result of the proposed stormwater design. Per ecological industry standard, when differences or conflicts between manuals or codes occur, the more ecologically protective provision shall apply. For this particular project, the more ecologically protective

provision would result in avoiding temporary and permanent impacts to the off-site stream and its associated on-site buffer area by routing project-related stormwater runoff to the west side of the property into a ditch which is not a regulated Critical Area.

Based on the factors considered, it is the professional opinion of *Wetlands & Wildlife, Inc.* that the proposal to route all project-related stormwater to the west of the subject property will not cause any adverse impacts to the regulated stream located east of the property. In fact, it is professional opinion of *Wetlands & Wildlife, Inc.* that the proposal to route all project-related stormwater to the west of the subject property will actually protect the regulated stream and its riparian zone.

LIMITATIONS AND USE OF THIS REPORT

This Stream Qualitative Assessment Report is supplied to *Zhang Family, LLC*. This report was specifically prepared for and is intended to be reviewed by the City of Mukilteo in conjunction with the associated permit application materials. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the environmental regulations currently in effect. The information contained in this report only includes a Stream Qualitative Assessment related to Comment #18 of the City of Mukilteo's comment letter dated September 19, 2017 for this proposed project. No other project-related evaluations were conducted by *Wetlands & Wildlife, Inc.*

No attempt has been made to determine hidden or concealed conditions. If hidden or concealed conditions arise, the information contained in this report may change. This report is based upon review of current and pertinent background literature, familiarity with the project site and the biological conditions of the general vicinity, best professional judgment, and many years of experience as a professional ecologist in different capacities throughout the Puget Sound region. The laws applicable to this assessment and environmental regulations are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. The work for this report has conformed to the standard of care employed by professional ecologists in the Puget Sound region. No other representation or warranty is made concerning our work or this report, and any implied representation or warranty is disclaimed.

This report constitutes a professional opinion and does not guarantee approval by any applicable federal, state, and / or local jurisdiction(s). Therefore, the proposal associated with this report shall not commence until all applicable permits have been received from all appropriate agencies.

If any questions arise regarding this review or report, please contact me directly at (425) 337-6450.

Wetlands & Wildlife, Inc.

Scott Spooner
Owner / Principal Wetland & Wildlife Ecologist

REFERENCES AND LITERATURE REVIEWED

Drainage Report for the Zhang Residence. Prepared by Dave Dougherty, PE of *Site Development Services*. June 1, 2017.

Forest Practices Application Mapping Tool. Maintained by the Washington State Department of Natural Resources. https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html.

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Mukilteo Parcel Viewer. City of Mukilteo, WA. http://mukilteo-city.maps.arcgis.com/apps/webappviewer/index.html?id=045daf698b8e4d5b893183aa874bfdf8.

Mukilteo Streams and Watersheds Map. City of Mukilteo, WA. https://mukilteowa.gov/wp-content/uploads/Streams-and-Watersheds.pdf.

SalmonScape. Interactive Mapping website administered by the Washington Department of Fish and Wildlife. http://wdfw.wa.gov/mapping/salmonscape/index.html.

Snohomish County Map Portal. Snohomish County, Washington. http://gismaps.snoco.org/Html5Viewer/Index.html?viewer=pdsmapportal.

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