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CRITICAL AREAS REPORT

Edgewood East Short Plat

Redmond, Washington

November 3, 2014

RAEDEKE ASSOCIATES, INC.



Wetland & Aquatic Sciences
Wildlife Ecology
Landscape Architecture

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Title: Critical Areas Report
Edgewood East Short Plat
Redmond, Washington

Project Number: 2014-009-003

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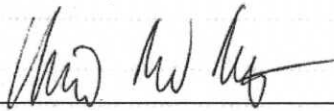
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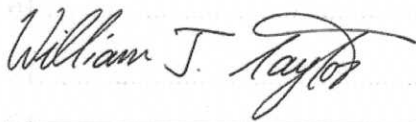
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November 3, 2014

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1.0 INTRODUCTION

1.1 PURPOSE

Raedeke Associates, Inc. was retained by Quadrant Homes to provide a critical areas evaluation of the proposed Edgewood East project site, including a wetland reconnaissance, wildlife habitat evaluation, and delineation and evaluation of a stream channel in the eastern end of the site. The report presents the findings of our background information review, February 4, 2014 and July 14, 2014 site investigations of the project site, and associated avoidance, minimization and mitigation measures related to the site stream channel and buffer. The report follows the City of Redmond critical areas reporting requirements (City of Redmond 2014). The report also provides a summary of mitigation measures that are to be implemented to compensate for identified impacts to the stream and riparian corridor.

1.2 PROJECT LOCATION

The Edgewood East project area is an approximately 7-acre parcel, located at 17811 NE 124th Street in the City of Redmond, Washington. The property is identified as Tax Parcel No. 2526059023. This places the property in Section 25, Township 26 North, Range 5 East W.M. (Figure 1). Parcel maps retrieved from King County (2014) iMap depict the property boundaries.

1.3 PROJECT DESCRIPTION

The proposed Edgewood East project would involve developing the western portion of the parcel into 24 single family lots. Access to the lots would be provided from NE 122nd Street which abuts the south boundary of the property. Buffer averaging is proposed along the west bank of the stream. The proposed site plan, buffer averaging plan, topographic surveys and other related existing conditions are provided in Figure 5.

2.0 METHODS

2.1 DEFINITIONS AND METHODOLOGIES

Wetlands and streams are protected by federal law as well as by state and local regulations. Federal law (Section 404 of the Clean Water Act) prohibits the discharge of dredged or fill material into “Waters of the United States,” including certain wetlands, without a permit from the U.S. Army Corps of Engineers (COE 2012). The COE makes the final determination as to whether an area meets the definition of a wetland and whether the wetland is under their jurisdiction.

2.1.1 Wetland Investigation

The COE wetland definition was used to determine if any portions of the project area could be classified as wetland. A wetland is defined as an area “inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Federal Register 1986:41251).

We based our investigation upon the guidelines of the U. S. Army Corps of Engineers (COE) Wetlands Delineation Manual (Environmental Laboratory 1987) and subsequent amendments and clarifications provided by the COE (1991a, 1991b, 1992, 1994), as updated for this area by the regional supplement to the COE wetland delineation manual for the Western Mountains, Valleys, and Coast Region (COE 2010). The COE wetlands manual is required by state law (WAC 173-22-035, as revised) for all local jurisdictions, including the City of Redmond. Hydrophytic vegetation is defined as “macrophytic plant life growing in water, soil or substrate that is at least periodically deficient in oxygen as a result of excessive water content” (Environmental Laboratory 1987). The U.S. Army Corps of Engineers National Wetland Plant List wetland indicator status (WIS) ratings were used to make this determination (Lichvar and Kartesz 2009). The WIS ratings “reflect the range of estimated probabilities (expressed as a frequency of occurrence) of a species occurring in wetland versus non-wetland across the entire distribution of the species” (Reed 1988:8). Plants are rated, from highest to lowest probability of occurrence in wetlands, as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL), respectively. In general, hydrophytic vegetation is present when the majority of the dominant species are rated OBL, FACW, and FAC.

A hydric soil is defined as “a soil that is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register 1995: 35681). The morphological characteristics of the soils in the study area were examined to determine whether any could be classified as hydric.

According to the 1987 methodology, wetland hydrology could be present if the soils were saturated (sufficient to produce anaerobic conditions) within the majority of the rooting zone (usually the upper 12 inches) for at least 5% of the growing season, which in this area is usually at least 2 weeks (COE 1991a). It should be noted, however, that areas having saturation to the surface between 5% and 12% of the growing season may or may not be wetland (COE 1991b). Depending on soil type and drainage characteristics, saturation to the surface would occur if

water tables were shallower than about 12 inches below the soil surface during this time period. Positive indicators of wetland hydrology include direct observation of inundation or soil saturation, as well as indirect evidence such as drift lines, watermarks, surface encrustations, and drainage patterns (Environmental Laboratory 1987). Hydrology was further investigated by noting drainage patterns and surface water connections between wetlands and streams within and adjacent to the project area.

2.1.2 Ordinary High Water Mark Delineation

We based our delineation of the ordinary high water mark (OHWM) of Stream A on definitions provided under the Washington State Shorelines Management Act of 1971. The Washington State definition for the OHWM is as follows:

Ordinary high water line" or "OHWL" means the mark on the shores of all waters that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual and so long continued in ordinary years, as to mark upon the soil or vegetation a character distinct from that of the abutting upland, provided that in any area where the ordinary high water line cannot be found, the ordinary high water line adjoining saltwater shall be the line of mean higher high water, and the ordinary high water line adjoining freshwater shall be the elevation of the mean annual flood." ... (RCW 90.58.030(2)(b) and WAC173-22-030(6); WDOE 1994).

As outlined in the WDOE (1994) Shoreline Administrators Manual, the general guidelines for determining the OHWM include: (1) a clear vegetation mark; (2) wetland/upland edge; (3) elevation; (4) a combination of changes in vegetation, elevation, and landward limit of drift deposition; (5) soil surface changes from algae or sediment deposition to areas where soils show no sign of depositional processes; and/or (6) soil profile changes from wetter conditions (low chroma, high soil organic matter, and lack of mottling) to drier conditions (higher chroma, less organic matter, or brighter mottles).

2.2 BACKGROUND RESEARCH

2.2.1 Wetlands

In preparation for our site investigation, we collected and analyzed background information available for the site prior to the on-site investigation. We collected maps and information from the U.S.D.A Natural Resources Conservation Service (2014) Web Soil Survey and U.S. Fish and Wildlife Service (USFWS 2014) National Wetland Inventory on-line mapper, and the Washington State Department of Natural Resources (WDNR 2014) on-line water types map.

The USFWS (2014) NWI map shows no wetlands on the site or within at least 300 feet. The City of Redmond (2012) wetland map likewise depicts no wetlands on the site, and only shows the stream course. The USDA NRCS (2014) soil survey depicts the site as having Alderwood gravelly sandy loam soils, 6-15% slopes (AgC), which is a non-hydric soil (USDA SCS 1991, Federal Register 1995).

2.2.2 Wildlife

We also accessed the online priority habitats and species (PHS) database maintained by Washington Department of Fish and Wildlife (WDFW 2014a) for documented information on the potential occurrence of federal- or state-listed endangered, threatened, sensitive, candidate, other priority, or monitor wildlife species (hereafter “species of concern”), or priority habitats on the project site and vicinity. State priority species are defined as those fish and wildlife species “requiring protective measures and/or management actions to ensure their survival”, and State priority habitats are defined as habitat types “with unique or significant value to many species” (WDFW 2008). We also reviewed database information maintained by the Washington Natural Heritage Program (2014) for occurrence of endangered, threatened, and sensitive plants in the vicinity of the project site.

Reference lists maintained by WDFW (2008) were consulted for information on the status of wildlife species of concern that could use the site during at least some part of the year. Species accounts and management recommendations provided by WDFW (e.g., Rodrick and Milner 1991, Larsen 1997, Azerrad 2004, Larsen et al. 2004) were consulted to determine habitat associations of such species and to evaluate the likelihood of their occurrence on the project site. During the field investigation, we searched for the presence of these species, or signs thereof, which could be found on the property.

The WDFW (2014a) PHS database map shows no occurrences of species of concern, including endangered, threatened, sensitive, or other priority species or habitats on or adjacent to the project site, other than potential presence of coast resident cutthroat trout (*Oncorhynchus clarki*) within Stream A. The City of Redmond’s (2012) map of core preservation areas shows no mapped fish and wildlife habitat conservation areas on the project site or immediate vicinity other than a Class II stream corresponding to Stream A. The Washington Natural Heritage Program (2014) database contains no records of Natural Heritage Features (e.g., listed plant species or Natural Heritage wetlands) in the section in which the project site occurs.

2.2.3 Streams

We also collected and analyzed stream background information available for the site. In addition to the City of Redmond Stream Classification map (City of Redmond 2012), the King County iMap (2014) and Washington State Department of Wildlife (2014b) Salmon Scape on-line resources were consulted. The Proposed Bear Creek Basin Plan (King County 1990) was also reviewed.

Personal contacts were also conducted with City of Redmond Planning Department and Natural Resources Division Staff to identify personal accounts of site condition, documentation of fish use and past stream documentation (Ms. Cathy Beam, City of Redmond, pers. comm. 7/15/14; Mr. Roger Dane, City of Redmond, pers. comm. 7/16/14; Ms. Thara Johnson, City of Redmond, 7/17/14). Request for previous critical areas reports for the parcel were also made to the Planning Department but none were located by Redmond Planning Department Staff (Ms. Cameron Zapata, City of Redmond, 7/17/14). Personal email communication with the King

County Bear Creek Steward also provided a narrative description of the overall conditions of stream 0120 (Mr. Tom Beavers, King County, pers. comm. 7/22/14).

The location of the stream on site is identified in the City of Redmond Stream Classifications Map (Figure 2) and identifies the stream as a Class II stream (City of Redmond 2014). The stream is also identified in the City of Redmond, WA Citywide Watershed Management Plan as a Class II stream, but a narrative description is not provided (City of Redmond 2013). This stream is identified as stream 0120 in the Washington State Department of Fisheries Stream Catalog (1975; Mr. Tom Beavers, King County, pers. comm. 7/22/14).

2.3 FIELD RECONNAISSANCE

2.3.1 Wetlands and Streams

An initial field reconnaissance was conducted on February 4, 2014 to search the site for the presence of wetlands and streams and characterize general site conditions. This field visit included flagging the ordinary high water mark (OHWM) of Stream A. Visual characterization of the stream channel was conducted and photographs taken at various locations within the property between the north boundary where the stream flows onto the property, and the east border where the channel exits the property. More specific qualitative observations of the channel were noted on July 14, 2014 at two locations, one near the north boundary and the other near the southern boundary. These later characterizations included an estimate of stream flow, bank height, vegetative cover, substrate size, water clarity, and potential habitat conditions for fish use.

In addition to the stream channel characterization, the riparian community on the west bank of the stream channel was characterized on July 14, 2014 for common species, canopy heights, density, and terrestrial habitat features.

Vegetation, soils, and hydrology were examined in representative portions of the study area according to the procedures described in the Regional Supplement (COE 2010). Plant communities were inventoried, classified, and described during our field investigation. We estimated the percent coverage of each species. Plant identifications were made according to standard taxonomic procedures described in Hitchcock and Cronquist (1976), with nomenclature as updated by the U.S. Army Corps of Engineers National Wetland Plant List (Lichvar and Kartesz 2009). Wetland classification follows the USFWS wetland classification system (Cowardin et al. 1992). We determined the presence of a hydrophytic vegetation community using the procedure described in the Regional Supplement (COE 2010), which requires the use of the dominance test, unless positive indicators of hydric soils and wetland hydrology are also present, in which case the prevalence index or the use of other indicators of a hydrophytic vegetation community as described in the Regional Supplement (COE 2010) may also be required.

We excavated pits to at least 18 inches below the soil surface, where possible, in order to describe the soil and hydrologic conditions throughout the study area. We sampled soil at locations that corresponded with vegetation sampling areas and potential wetland areas. Soil colors were determined using the Munsell Soil Color Chart (Munsell Color 2009). We used the

indicators described in the Regional Supplement (COE 2010) to determine the presence of hydric soils and wetland hydrology.

2.3.2 Wildlife

During this field investigation, we documented wildlife presence, sign, and habitat while inventorying and describing plant communities. We recorded information regarding reproduction, habitat use, and activities of all wildlife species observed. In addition, we noted special habitat features such as large and/or hollow trees, snags [standing dead or partly dead trees at least 4 inches diameter at breast height (dbh) and 6 feet tall], and large down logs. Historic and present land-use of the site and immediate vicinity were noted from direct observations in the field and analysis of aerial photographs.

During our field surveys, we also searched specifically for the presence, sign, or habitats of any wildlife species of concern that may occur on the project site or vicinity. In particular, we searched for the presence of large stick-type nests, hollow trees, tree cavities, and pileated woodpecker foraging sign. Large stick nests are built and used by several species of concern, including bald eagles and great blue herons. Tree cavities are created and used by woodpeckers, including species of concern such as the pileated woodpecker, and can provide habitat for a host of bird and mammal species, including species of concern such as purple martins, various cavity-nesting duck species, and various bats. Hollow trees are used as daytime roost for priority species including various bat species, as well as Vaux's swifts.

3.0 EXISTING CONDITIONS

3.1 GENERAL SITE DESCRIPTION

The Edgewood East property is a largely undeveloped parcel that appears to have been previously used as a plant nursery. A gravel access drive enters the site from the northwest corner into grassy and shrubby opening with a building in the southwestern portion of the site. Piles of plant pots, irrigation pipe, and abandoned vehicles occur in this portion of the property as well. The northern and eastern portions of the property contain a deciduous forest vegetation community.

During our site investigation on February 4, 2014 we identified and delineated Stream A on the property. The stream enters the site along the north property boundary and flows southeasterly through the parcel before leaving the site to the east. The stream is 6- to 8-foot wide and is deeply incised through the northeast corner of the site. The stream channel generally lacked vegetation and lacked fringing wetland communities.

3.2 WETLAND RECONNAISSANCE

We found no evidence of wetlands occurring on the property. Vegetation in the opening in the southwestern part of the site consisted of Himalayan blackberry (*Rubus ameniacus*), with some reed canarygrass (*Phalaris arundinacea*). The northwestern part of the site consisted of a deciduous forest dominated by black cottonwood (*Populus balsamifera*), with widely scattered conifers, and Himalayan blackberry. As described below, the remainder of the site along the stream corridor consisted of deciduous forest of variable composition, dominated by big-leaf maple (*Acer macrophyllum*) and cottonwood in the north and red alder (*Alnus rubra*) and cottonwood in the south portion. The understory consisted of dense tall shrub cover that varied in composition, ranging from dense stands of vine maple (*Acer circinatum*) and salmon raspberry (*Rubus spectabilis*), to areas dominated almost exclusively by Himalayan blackberry (*Rubus ameniacus*). Low cover included stinging nettle (*Urtica dioica*), reed canarygrass (*Phalaris arundinacea*), trailing blackberry (*Rubus ursinus*), sword fern (*Polystichum munitum*), and lady fern (*Athyrium filix-femina*).

Soils were generally consistent with the Alderwood series mapped for the site, with brown to dark brown (10YR 4/3 to 10YR 4/2) subsoil and without redoximorphic features or any indicators of hydric soil conditions. No water table or saturated soil was observed anywhere outside of the stream channel on site. Sample plots were located in the southwest portion of the site and along the west side of the stream channel (Figure 4, Appendix A).

3.3 STREAM CHANNEL ASSESSMENT

3.3.1 Stream Description

The Edgewood East Project property generally consists of relatively flat terrain except for the deeply incised stream banks of Stream A. Stream A is the only stream on site, and is identified as a Class II stream (City of Redmond 2013; Figures 2, 3). The overall stream length of Stream A on the property is approximately 425 feet, with an elevation drop of approximately 14 feet, for an overall slope of 3.3%.

Soils on the property are mapped entirely as Alderwood gravelly sandy loam (USDA NRCS 2014). Stream A is a second order stream that is highly incised through the overlying gravelly sandy loam. The incising process appears, however, to have reached the hardened till layer without further incision in recent years (as an indication of this, a deciduous tree fallen laterally from the bank was observed to have continued to grow back to a vertical position to a diameter of approximately 4 to 6 inches).

Stream banks in the northern portion of the site are the most incised on the site, with vertical bank walls approximately 15 feet in height (Photo 1). As the channel progresses through the property the banks are less incised (Photo 2). Stream substrate in the stream bed is primarily medium to small cobble, gravel, small gravel and sand; these substrate sizes have been graded by higher stream flows from large to small from the middle of the channel to the bed margins (Photo 3).

Canopy cover of the stream channel is dense throughout the project reach. Both high canopy deciduous trees, and lower canopy vine maple, blackberry, and other shrubs provide approximately 50 to 90 cover of the stream channel during the growing season.

Flow in Stream A is small during base flows throughout the year. Flow during the February 4, 2014 site visit was approximately 0.25 to 0.5 cfs, and only about 1 gallon per minute or less during the July 14, 2014 site visit. Water clarity was visibly good and water temperatures were approximately 50 to 60 degrees F.

Stream A is classified as a Class II stream by the City of Redmond indicating salmonid use, although there is a partial barrier to migration downstream at the Redmond City limits (City of Redmond 2013). We observed no blockages to fish passage within the project site. City of Redmond Natural Resources Division staff stated they have anecdotal documentation of salmonid use upstream in a nearby upstream King County development critical areas report (Roger Dane, City of Redmond, pers. comm. 7/16/14), and the Washington State Department of Natural Resources identifies this stream as fish bearing (WDNR 2014). Channel habitat types within the property boundary are almost exclusively riffle reaches with no pools observed in the portions of the stream assessed during the site visits.

3.3.2 Stream Value as Fish Habitat

Stream A on the site is a segment of stream 0120, a tributary to Bear Creek, as catalogued by the Washington State Department of Fisheries (1975; Tom Beavers, pers. comm. 7/22/14). This stream has reports of the presence of salmonid fishes, likely only cutthroat trout in some portions of the overall stream, juvenile salmonid use near the mouth, but no use by adult pacific salmon for spawning (WDNR 2014; Tom Beavers, Bear Creek Steward, King County, pers. comm. 7/22/14; Roger Dane, City of Redmond, pers. comm. 7/16/14). This stream is recognized as having deeply incised channels and associated sediment delivery to the lower creek reaches (King County 1990). The lower reach of stream 0120 includes wetland and pasture areas where livestock have access to the creek (Tom Beavers, King County, pers. comm. 7/22/14).

Because of the limited pool habitat and extremely low base flows throughout the year, salmonid fish use on the site is highly unlikely, except possibly transitory presence during high flows if a fish population exists upstream. Otherwise the contributing habitat values originating on the site will come from the organic inputs (both detrital and live prey organisms) contributed mostly from the riparian canopy, which is transported downstream where more fish populations may occur. The vegetative cover will also help maintain cooler water temperatures as the stream flows through the property.

3.4 RIPARIAN CORRIDOR AND SITE HABITAT CONDITIONS

Canopy cover in the riparian corridor in the northern portion of the property (upstream reach) is characterized by big-leaf maple (*Acer macrophyllum*) and black cottonwood (*Populus balsamifera*) extending approximately 100 feet upland from the stream corridor on either side. These trees appear to be approximately 30 to 40 years in age and are homogeneous in terms of stand age composition. The understory is a patchwork with sections dominated by dense stands of vine maple (*Acer circinatum*) and salmon raspberry (*Rubus spectabilis*), while other segments comprise almost exclusively of Himalayan blackberry (*Rubus ameniacus*). Scattered throughout the understory are several grasses and herbs including stinging nettle (*Urtica dioica*), reed canarygrass (*Phalaris arundinacea*), trailing blackberry (*Rubus ursinus*), sword fern (*Polystichum munitum*), and lady fern (*Athyrium filix-femina*). Very little recruitment of juvenile big-leaf maple and black cottonwood was observed in the understory community (Photo 4).

We observed at least one snag 30 feet tall and greater than 8 inches in diameter in the riparian corridor, as well as a number of downed logs of greater than 6 inches diameter. Woodpecker foraging excavations were also noted on at least one of these features. This portion of the stream is deeply incised, but primarily small diameter (4 to 8 inches) woody debris and vegetation is abundant in the stream channel. The canopy cover provided approximately 50% stream cover in this reach, greatly contributing to stream temperature moderation.

The composition of the canopy transitions as the stream meanders south. Big-leaf maple is replaced by red alder (*Alnus rubus*) and black cottonwood as the dominant canopy cover. Trees in this reach appear to be approximately 30 to 40 years in age and extend along the riparian corridor and into the upland for approximately 100 feet on either side of the stream channel. We observed very few saplings in the under story suggesting poor community recruitment. Stands of vine maple and salmon raspberry become thicker through the understory in this portion of the property, with less Himalayan blackberry observed. Cut-leaf blackberry (*Rubus laciniatus*), reed canarygrass, sword fern, and lady fern, and stinging nettle were also observed in portions of the under story.

A large down log approximately (15 inch diameter and 20 feet long) was noted approximately 50 feet up from the stream channel, in addition to several smaller standing snags in the southern part of the site. The channel is less incised at this point on the property and large woody debris was more abundant than upstream. We noted at least one log of greater than 20 inches diameter fallen across the stream channel. Our visual estimations indicate that the stream is approximately 70 to 90 percent shaded in this portion of the reach due to dense canopy overhang

from alder and cottonwood and the thick under story of vine maple and salmon raspberry growing up to the stream edge. The density of vegetation in this portion of the reach provides significant temperature regulation and opportunity for large woody debris recruitment.

As noted above, the deciduous forest continues westward from the riparian corridor in the northern part of the site, dominated mainly by cottonwood with an understory of Himalayan blackberry. The southwestern part of the site includes a building and a variety of debris within an opening dominated by Himalayan blackberry and reed canarygrass (Figure 4).

The deciduous forest vegetation community within the site has no distinct edges, other than more subtle changes in composition as noted above. The most distinct edges are those between the on-site forest and shrub and grass opening in the southwest corner, and between the on-site forest and surrounding properties, particularly on the north, east, and south. The edges are formed by residential housing and associated paved roads (Figure 4). occur off site to the west within the park property between the mixed forest cover and the lawn area of the park. Areas along habitat edges are subject to a number of special environmental factors as compared to larger, more contiguous forest patches, and these factors can positively or negatively affect wildlife. Edge habitat is preferred by many wildlife species, which may increase wildlife species richness and diversity. However, negative factors that are prevalent in edge habitat include increased likelihood for colonization by invasive plant species, increased presence of mid-sized carnivores such as raccoons (potentially leading to increased depredation and decreased reproductive success for resident wildlife), and greater fluctuations in understory temperature, among others.

3.5 WILDLIFE

3.5.1 Wildlife Use and Observations

A wide variety of wildlife species may be expected to inhabit lowland deciduous or mixed forest communities in the Pacific Northwest, such as that found on the project site. Of the more than 300 vertebrate wildlife species expected to occur in west side forests of Oregon and Washington, over 230 species occur within west side lowland mixed coniferous and deciduous forests (Johnson and O'Neil 2001). A more limited number of species are expected to occur within lowland deciduous or mixed forests of western Washington, particularly King County: over 80 species, nearly 60% of which are birds, about 25% are mammals, and the rest are amphibians and reptiles (King County 1987). The number of species expected to inhabit a particular forest stand depends on its size, landscape context, and surrounding uses. Relatively small stands such as that on the Edgewood East property that are surrounded by urban residential uses, would be expected to support a more limited number of wildlife species. Those that do occur there may be further adversely affected by surrounding human activity and predation or other influences from urban-adapted species (such as crows and starlings), or other invasive species.

We observed relatively few wildlife species or their sign during our field reconnaissance visits. Our field visits were conducted during winter and summer (February and July), outside much of the breeding season for birds. As noted above, we also saw sign of past foraging activity by pileated woodpeckers and other small woodpecker species (likely hairy or downy woodpeckers). The number of species that we observed is also likely limited by the relatively small size of the

site and the surrounding suburban land uses. Species observed primarily include those adapted to Puget Sound lowland mixed forest, as well as those that can persist in fragmented forest habitat and/or residential areas.

A variety of other bird species are likely to inhabit the site and vicinity at different times of the year. Many of these are spring and summer residents that migrate out of the area for the fall and winter, as well as year-round residents. We observed no raptors (eagles, hawks, falcons, or owls) during our field reconnaissance, and no raptor nests were found on any of the trees within the site. Most of the larger trees had intact tops and lacked appropriate branching structures to support large raptor nests such as bald eagles.

Other than deer (a doe and fawn) walking through small canopy opening of reed canarygrass in the riparian corridor, we observed no mammals or their sign during our field reconnaissance. Several species of small and medium-sized mammals likely use the site, though many are secretive and/or nocturnal and are therefore unlikely to be observed during a general site reconnaissance. The down woody debris was widely scattered the site, and although limited in extent, along with areas of dense areas of shrub and ground cover, provide potential cover and breeding habitat for small mammals. In addition, on-site trees and snags provide potential cover and breeding locations for medium-sized mammals such as raccoons and squirrels. The presence of domestic dogs and cats in the area may limit the suitability of the forest on site, as they can act as highly effective predators on native wildlife species in urban and suburban areas, particularly those that nest or inhabit the ground (Penland 1984, Maestas et al. 2003, Odell and Knight 2001, Leu et al. 2008).

We did not observe any reptiles, amphibians, or their sign during our field reconnaissance, though a small number of species of each group is likely to be present. The minimal amount of down woody debris on the site and the lack of wetlands may limit the number of Puget Sound lowland terrestrial-breeding amphibians that could occupy the site. Amphibians would most likely be expected to center activities on Stream A and the riparian corridor on site. Potential cover and foraging habitat is present on the site for some reptiles, including garter snakes, and some amphibians.

3.5.2 Endangered, Threatened, Sensitive, or Other Priority Species

We observed no species listed as endangered, threatened, or sensitive within the project site or immediate vicinity, nor are any of these species considered to have a primary association with the project site (other than potential fish habitat in the stream, as discussed above). As noted above, sign of previous foraging by pileated woodpecker, a state candidate species, was observed in one snags on site, but none of this sign appeared to be fresh (i.e., occur since at least this last fall or winter). No snags appeared to be large and tall enough to provide suitable nesting or roosting habitat for pileated woodpeckers. No other priority or other species of concern were observed or likely to occur within the project site.

3.5.3 Wildlife Habitat Movement Corridors and Networks

Wildlife habitat networks or corridors can take different forms, depending on the landscape. Corridors can be in the form of hedgerows or fencerows connecting woodlots in an agricultural landscape. In a fragmented forested landscape, corridors are linear patches of forest or forested riparian zones connecting larger patches of forest. They can also be non-forested linear patches, such as utility easements, or wetland and stream systems, in a landscape that is forested. In an urbanizing environment, open space or native forestland can act as corridors connecting otherwise disjunct habitat for wildlife species.

Corridors can provide (1) habitat for certain species; (2) movement pathways; (3) extensions of foraging ranges for large, wide-ranging species; and (4) escape from predators (Harris 1984, Levenson 1981, Noss 1987, Noss and Harris 1986, Simberloff and Cox 1987). Corridors may also have disadvantages, such as (1) providing conduits for disease, fire, pests, and exotic species; (2) increasing exposure to predation; and, (3) potentially having negative genetic impacts on a population (Noss 1987, Simberloff and Cox 1987).

The Edgewood East property is situated generally within a larger area of residential development. The forested habitat of the site (primarily along the stream corridor) is contiguous with similar forest stands that extend off site to the southeast, and for a short distance to the west, but are highly fragmented by existing development in the area. Because of the surrounding development, these habitats are relatively isolated from other native habitats within the City of Redmond and therefore do not provide linkages to other such habitats. This also is evident on the City of Redmond Map of Core Preservation Areas, none of which are located near the site. The site scored a total of 16 points on the City of Redmond Habitat Unit Assessment Form (attached in Appendix B).

4.0 REGULATORY CONSIDERATIONS

4.1 WETLANDS AND STREAMS

Wetlands and streams are protected by Section 404 of the Federal Clean Water Act and other state and local policies and ordinances including the City of Redmond (2014) code. Because no wetlands were found to occur within the property or immediate vicinity, no further discussion of wetland regulations is provided here.

The City of Redmond (2014) regulates streams as one type of “Fish and Wildlife Habitat Conservation Areas” (hereafter, FWHCA’s) under Chapter 21.64 of its Zoning Code (RZC). The city classifies streams as Class I, II, III, or IV based on whether they are Shorelines of the State (Class I), and otherwise their potential as fish habitat, seasonality or persistence of flow, and whether they are headwaters. The City of Redmond (2014) determines stream buffer widths based on their classifications. Stream buffer widths are measured perpendicular from the stream Ordinary High Water Mark (OHWM) as surveyed in the field. Standard stream buffer widths may be modified by averaging or be increased, on a case by case basis by the City of Redmond.

Stream A on the project site is classified as a Class II stream because it is considered accessible to salmonid fish, and is not listed as a Shoreline of the State. The Redmond (2014) code requires a standard buffer totaling 150 feet on Class II streams such as Stream A, consisting of a 100-foot inner buffer and a 50-foot outer buffer.

4.2 WILDLIFE

4.2.1 State of Washington

State law provides protections for wildlife species listed as endangered (WAC 232-12-014), as well as threatened, sensitive, or “other protected” species (WAC 232-232-011). Recently, bald eagles have been down-listed to “sensitive” at the State and de-listed at the federal level. However, in Washington, bald eagles are still protected by the Bald Eagle Protection Act of 1984 (RCW 77.12.655), and the Bald Eagle Protection Rules (WAC 232-12-292). The Bald Eagle Protection rules have been recently amended such that state bald eagle management plans are no longer required unless bald eagles are listed as Threatened or Endangered in Washington State.

The WDFW (2012) PHS and HRTG databases show no known nest or roost sites of eagles or other listed raptor species (such as hawks or owls) in the vicinity of the project site. In addition, we found no raptor nests or potentially suitable nest trees on the project site or in the vicinity.

In addition, the WDFW (2008) has developed management recommendations for “species of concern,” which include state listed and other priority species, as well as priority habitats. Occurrences or signs of priority species or habitats in the vicinity of the project site are noted above. These management recommendations are often referenced in local critical area ordinances, such as the City of Redmond in protection of “Fish and Wildlife Habitat Conservation Areas,” or FWHCA.

4.2.2 City of Redmond

Redmond (2014) regulates wildlife habitat as “Fish and Wildlife Habitat Conservation Areas” (hereafter, FWHCA’s) under Chapter 21.64 of its Zoning Code (RZC). The Redmond Zoning Code generally identifies the following as FWHCA’s: (1) federal endangered and threatened species, (2) state endangered, threatened, sensitive, and state candidate species, (3) WDFW priority habitats and species, (4) Habitats and Species of Local Importance, which in Redmond are identified as great blue herons, (5) natural ponds less than 20 acres in size, (6) waters of the state, (7) lakes, ponds, streams, and rivers planted with game fish, and (8) land essential for preserving connections between habitat blocks and open spaces.

As noted above, no federal or state endangered, threatened, or sensitive species were observed on site, nor are they considered to inhabit or have a primary association with the site. The only terrestrial priority species known to occur on site was the pileated woodpecker (a state candidate species), primarily from foraging excavations that appeared to be relatively old. No fresh sign was observed, and none of the snags found on site appeared to be large enough to provide suitable nesting habitat for this species. We found no evidence of use of the site by great blue herons, which are identified as a species of local importance by the City. No wetlands or ponds, occur within the site or immediate vicinity. Only Stream A, which is rated as a Class II Stream and considered accessible to salmonid fish (such as cutthroat trout), is located on site. Although the site is contiguous with forested habitat along the stream corridor that extends off site, this habitat becomes highly fragmented off site by surrounding suburban residential development.

5.0 IMPACTS

The following discussion of direct and indirect wetland impacts below is based on our review of revised site plans provided to us by Blue Line Group, LLC on October 20, 2014.

5.1 IMPACTS TO VEGETATION

Residential housing and an associated access road would be developed in the western portion of the property. The proposed development would remove approximately half of the forest habitat, as well as the open shrub area, on the site. The stream and associated forested riparian corridor encompassing an averaged buffer would be retained in the eastern portion of the property. Thus, no direct impact to the stream would occur as a result of the proposed development. In addition, the development would retain most of the existing snags on site. The proposed development would thus increase fragmentation of the remaining forest habitat and increase the amount of artificial edges with adjoining single-family residential areas.

5.2 IMPACTS TO WILDLIFE

Direct alteration (reduction) to the distribution, composition, and amount of native vegetation resulting from the proposed residential development would affect the distribution and composition of native wildlife on the property. In addition, indirect impacts to habitat retained on-site would make it less suitable for some species of wildlife currently inhabiting the site.

Upon completion, the proposed residential development would reduce the forest habitat available for native wildlife on the site. This would reduce the local populations of most native species on the property. Grading and construction activities associated with the proposed development, as well as increased levels of human activity on-site, would also result in increased short- and long-term disturbance to wildlife species using the retained habitat areas. This would further reduce the suitability of the on-site habitats to some wildlife species, particularly those vulnerable to predation by domestic cats and dogs (Penland 1984). Some species adapted to urban environments and fringes, including many non-native plant and animal species, would find suitable habitat on-site, and may become established and/or increase in numbers. Some species less adapted for urban environments, however, would be expected to decrease in numbers, and some wildlife species may be eliminated from the site entirely.

Impacts to Endangered, Threatened, Sensitive, or Other Priority Species or Habitats

Because endangered, threatened, and sensitive wildlife species are not known or likely to occur on or in the site or have a primary association with any impacted habitats, no impacts to these species are expected. The proposed subdivision would likely retain most snags on site, including those used by foraging pileated woodpeckers, a state candidate species. The proposed development is not expected to have a substantial adverse impact on pileated woodpeckers, however, as they do not appear to be foraging there currently, and none of the snags on site appear to be suitable for nesting or roosting. In addition, the Edgewood East property is small compared to the large home ranges (more than a square mile) typically occupied by pileated woodpeckers (Lewis and Azerrad 2004), and thus does not likely represent a significant portion

of the habitat areas used by pileated woodpeckers in the vicinity. No other terrestrial priority species, or species of local importance, are known or likely to inhabit the site. Thus, the proposed development would not adversely affect such species.

The proposed site plan would retain the Class II stream and buffers as native open space. The site contains no wetlands or other habitats designated as fish and wildlife conservation areas, so the proposed development would not affect such habitats. Consequently, no habitats or habitat features known or suspected to be used by other priority species or species of local importance would be affected by the proposed site plan.

5.3 IMPACTS TO THE STREAM CORRIDOR

The stream corridor and associated forested riparian corridor encompassing an averaged buffer would be retained in the eastern portion of the property. Thus, no direct impact to the stream would occur as a result of the proposed development.

The proposed site plan includes a minor amount of buffer averaging to the required stream buffers to accommodate lot clearing and grading (Figure 5). The proposed buffer encroachment totals 5,554 square feet along the northern portions of the stream corridor. As compensation, an additional 5,720 square feet of buffer would be provided along the southern portion of the corridor (Figure 5), for a net increase in buffer area of 166 square feet. This buffer averaging would retain the required 50-foot outer buffer. The 100-foot inner buffer would be reduced to a minimum of over 78 feet wide and in areas of buffer compensation range up to well over 100 feet wide.

In addition, a small portion of the outer buffer (less than 20%, totaling 8,035 square feet) would be cleared to accommodate lot grading and level spreaders to discharge roof runoff from selected lots (Figure 5). The area of temporary clearing is currently dominated by Himalayan and trailing blackberry, salmonberry, and reed canarygrass, along with a few small to medium deciduous trees (cottonwood and big-leaf maple) as overstory. The areas temporarily cleared to accommodate lot grading would be revegetated with a mixture of native plant species, including shrubs, trees, and ground cover, in order to stabilize soils and restore habitat for native wildlife.

The City of Redmond (2014) allows stream buffer averaging, subject to the following criteria:

Stream Buffer Width Averaging. The Administrator may allow the recommended stream buffer width to be reduced in accordance with best available science only if:

- a. The width reductions will not reduce stream or habitat functions, including those of non-fish habitat;*
- b. The width reduction will not degrade the habitat, including habitat for salmonid fisheries;*
- c. The proposal will provide additional habitat protection;*

- d. *The total area contained in the stream buffer area after averaging is no less than that which would be contained within the standard stream buffer area; and*
- e. *The buffer width is not reduced to less than 25 percent of the standard stream buffer width or 25 feet, whichever is greater.*

For Class II streams, buffer averaging may be applied to the inner buffer. The following provisions apply to the inner buffer:

- f. *The width of the inner buffer shall not be reduced below 75 percent of the required inner buffer width at any point;*
- g. *Encroachment shall not occur into the buffer of an associated wetland;*
- h. *The area of the inner buffer after averaging shall be equivalent to the area of the inner buffer prior to averaging;*
- i. *There is a net improvement in overall buffer ecological functions; and*
- j. *Averaging shall not preclude the opportunity for future recovery of structure and function.*

For Class I and II streams, maximum clearing and grading within the outer 50-foot buffer is 35 percent of the outer buffer area. Nothing in this provision shall be construed to require remediation of existing situations where the current clearing and grading is in excess of 35 percent. No net effective impervious surface may be created within this area.

Specifically, the proposed buffer averaging plan meets the City of Redmond (2014) requirements listed above in the following ways:

- a. The proposed averaging would not adversely affect stream functioning. The retained overall buffer would vary from a minimum of more than 122 feet to well over 150 feet. This would retain the riparian forest and shrub cover that provides potential recruitment of large woody debris, stream shading to maintain cool temperatures, and help maintain slope stability.
- b. The proposed averaging will retain potential habitat for fish as under current conditions, and will retain an equal or greater amount of forested habitat compared with standard buffers.
- c. The total area of stream buffer after averaging will exceed the area of standard buffers by 166 feet, and will be retained in a designated open space tract with covenants to protect it and restrict uses, thus providing protection not provided under current conditions as an abandoned site.
- d. The total area within the averaged buffer exceeds the area contained in the standard buffer.
- e. The minimum width of the overall buffer would be over 122 feet, or 82% of the overall standard buffer width of 150 feet.
- f. The of the inner buffer would be at least 78 feet wide or 78% of the standard inner buffer of 100 feet.

- g. No associated wetlands occur along the stream channel. Consequently, no buffer encroachments are proposed on any wetlands.
- h. The area of the inner buffer after averaging would exceed the area of the standard inner buffer by 166 square feet.
- i. With formal designation of the stream and associated buffers in an open space tract with covenants restricting allowed uses, we would expect an equivalent to incremental increase in ecological functioning, compared with standard buffers. The buffer compensation area consists of deciduous forest of comparable functioning as the encroachment area. Invasive species, including Himalayan blackberry and reed canarygrass, would be removed in areas temporarily cleared to accommodate lot grading, and these would be replaced with a mixture of native shrubs, trees, and ground cover.

The maximum clearing would be limited to less than 20% of the outer buffer, less than the allowed maximum of 35%. No effective impervious areas would be constructed within the outer 50-foot buffer.

6.0 MITIGATION

Mitigation has been defined by the State Environmental Policy Act (SEPA) (WAC 197-11-768; cf. Cooper 1987), and more recently in a Memorandum of Agreement between the Environmental Protection Agency and the U.S. Army Corps of Engineers (Anonymous 1989). In order of desirability, mitigation may include:

1. **Avoidance** - avoiding impacts by not taking action or parts of an action;
2. **Minimization** - minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. **Compensation** - which may involve:
 - a) repairing, rehabilitating, or restoring the affected environment;
 - b) replacing or creating substitute resources or environments;
 - c) mitigation banking.

6.1 AVOIDANCE AND MINIMIZATION

Conversion of the Edgewood East property to a residential development would incorporate one or more mitigating measures that would avoid or reduce impacts to on-site habitat.

The proposed development plan for the Edgewood East property would establish an open space tract encompassing the Class II stream and associated forested riparian buffer (Figure 5). The proposed development plan incorporates a number of other design features that would avoid or minimize impacts to the retained areas and off-site habitats:

- Direct impacts to the on-site Class II stream would be avoided;
- The forested stream buffer would retain a substantial portion of the forested habitat on site; The limits of the buffer tract would be clearly marked with fencing and critical area signage per City of Redmond requirements;
- No residential structures, impervious surfaces, or trails would be located within the designated open space tract;
- The proposed development would route the majority of stormwater runoff to a detention vault to provide water quality treatment and discharge it at controlled rates via pipe down the slope to an energy dissipater near the stream course protect downstream resources;
- In addition, stormwater runoff from selected lots would be directed to separate level spreaders within the outer buffer to promote infiltration and limit potential for sediment transport from concentrated flows;

- Temporary erosion and sediment control (TESC) measures would be installed during construction and would utilize appropriate best management practices (BMPs) designed to prevent sediment deposition to on-site open space tracts and off-site areas;

6.2 COMPENSATORY MITIGATION

As outlined above, the proposed site plan includes buffer averaging on the Class II stream. The buffer averaging includes additional buffer area to compensate for proposed buffer encroachments. The buffer compensation is discussed more fully in Section 5 above (see Figure 5).

In addition, the areas of temporary buffer clearing within the outer buffer to accommodate lot grading would be revegetated with a mix of native trees, shrubs, and groundcovers that will restore buffer vegetation, provide habitat (cover and forage) for wildlife, and act to trap potential sediment and pollutants in surface water run-off from reaching the stream. The area of grading would remove invasive species currently growing in the forest, to be replaced with native plants. Prior to planting, a minimum of 12 inches of topsoil would be installed throughout the buffer enhancement area to provide favorable growing conditions for the tree and shrub plantings establishment and growth. Topsoils must be approved by the project biologist prior to installation. Soil amendments, such as compost that has been prior-approved by the project biologist, may be added to salvaged on-site soils in order to create favorable soil conditions for tree and shrub planting establishment and growth.

Plantings would consist of species well-adapted to site conditions and which would provide wildlife habitat value for foraging and cover. These may include western red cedar (*Thuja plicata*), big-leaf maple, salmon raspberry, vine maple, snowberry (*Symphoricarpos albus*), salal (*Gaultheria shallon*), Cascade Oregongrape (*Mahonia nervosa*), and sword fern. All plant materials would be locally grown and be of local origin. Tree stock would be two or five gallon container, 3- to 4-feet tall, and well-rooted and branched. Trees would be planted on 9-foot centers. Shrub stock would be one gallon, 18- to 24-inches tall, well-rooted and branched. Shrub plantings would be spaced on 5-foot centers.

Upon approval of this conceptual revegetation plan, a final planting plan and construction specifications would be prepared for review and approval by the City. The final planting plan would specify such items as: (1) plant species, quantities, and sizes, (2) planting locations, (3) general notes, (4) planting details, (5) construction timing, (6) protection of existing vegetation, (7) source of plant material, (8) soil amendments, (9) watering, and (10) maintenance. The final revegetation plans would include a systematic monitoring program to assess the success of the effort, as required by City of Redmond (2014) code. The monitoring program would include construction, compliance, and long-term monitoring. The duration of a long-term monitoring program would be established per City of Redmond requirements. Performance standards of success (for use in monitoring), as well as contingency plans as needed, would also be developed in coordination with the City.

7.0 LIMITATIONS

We have prepared this report for the exclusive use of Quadrant Homes and its consultants. No other person or agency may rely upon the information, analysis, or conclusions contained herein without permission from Quadrant Homes.

The determination of ecological system classifications, functions, values, and boundaries is an inexact science, and different individuals and agencies may reach different conclusions. With regard to wetlands, the final determination of their boundaries for regulatory purposes is the responsibility of the various agencies that regulate development activities in wetlands. We cannot guarantee the outcome of such determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies.

We warrant that the work performed conforms to standards generally accepted in our field, and prepared substantially in accordance with then-current technical guidelines and criteria. The conclusions of this report represent the results of our analysis of the information provided by the project proponent and their consultants, together with information gathered in the course of the study. No other warranty, expressed or implied, is made.

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For more information, contact the Office of Research and Statistics, Room 5030
 Administration Building, Washington, D.C. 20451

2-74 (Rev. 1-73)

FIGURES

1. The following figures are based on data from the 1972 Survey of Health, Education, and Income, which was conducted by the U.S. Department of Health, Education, and Welfare, Washington, D.C. 20451.

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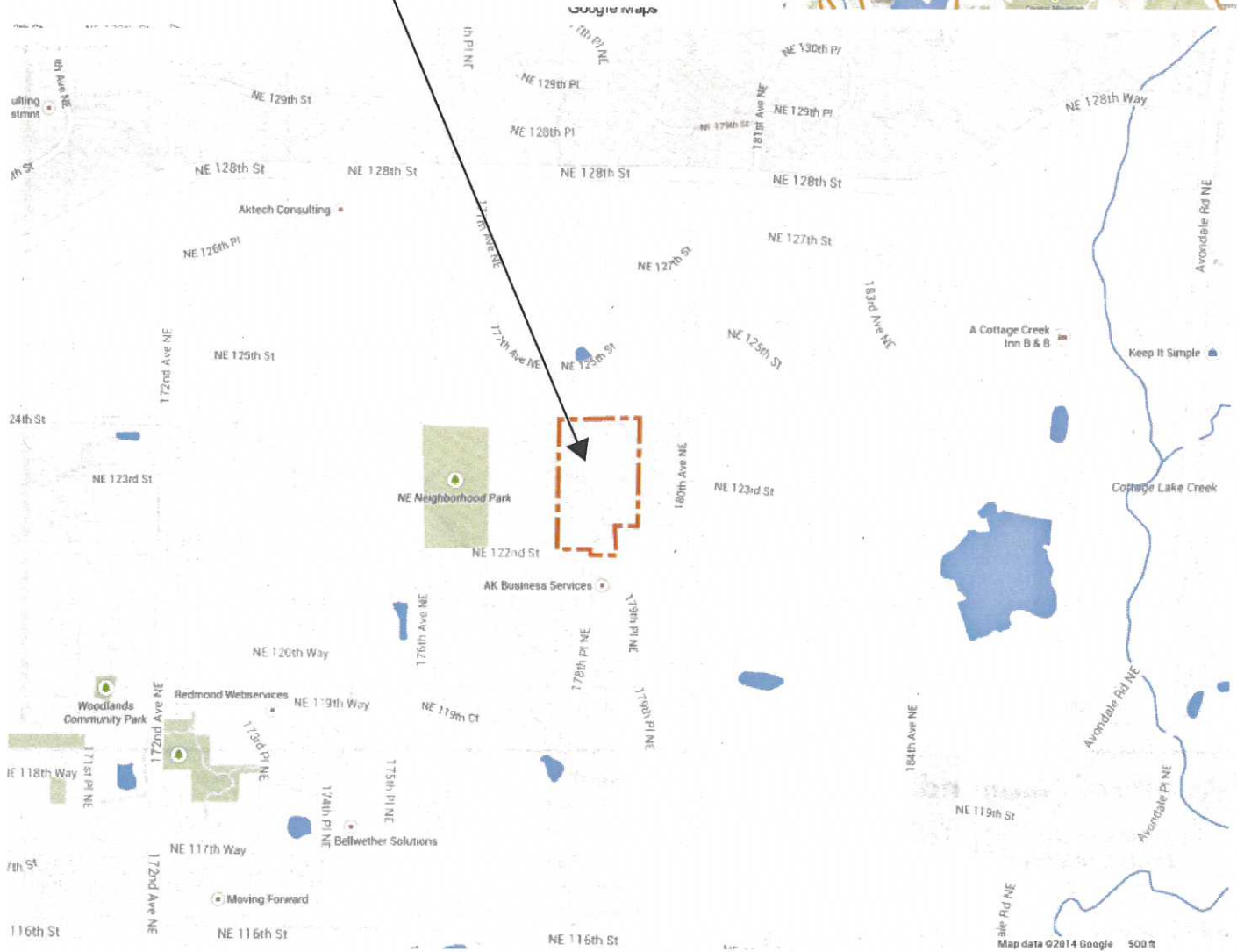
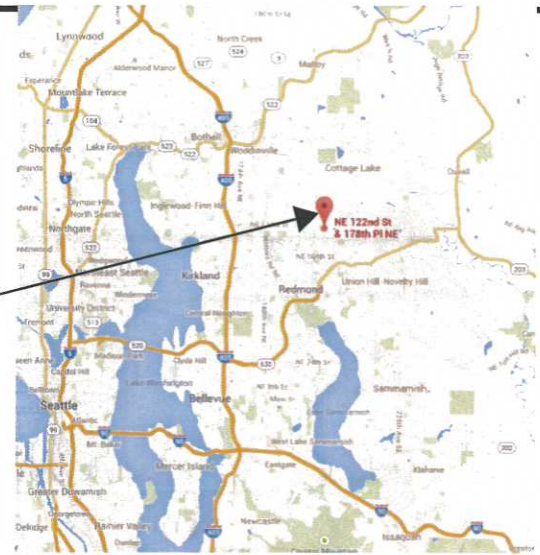
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EDGEWOOD EAST



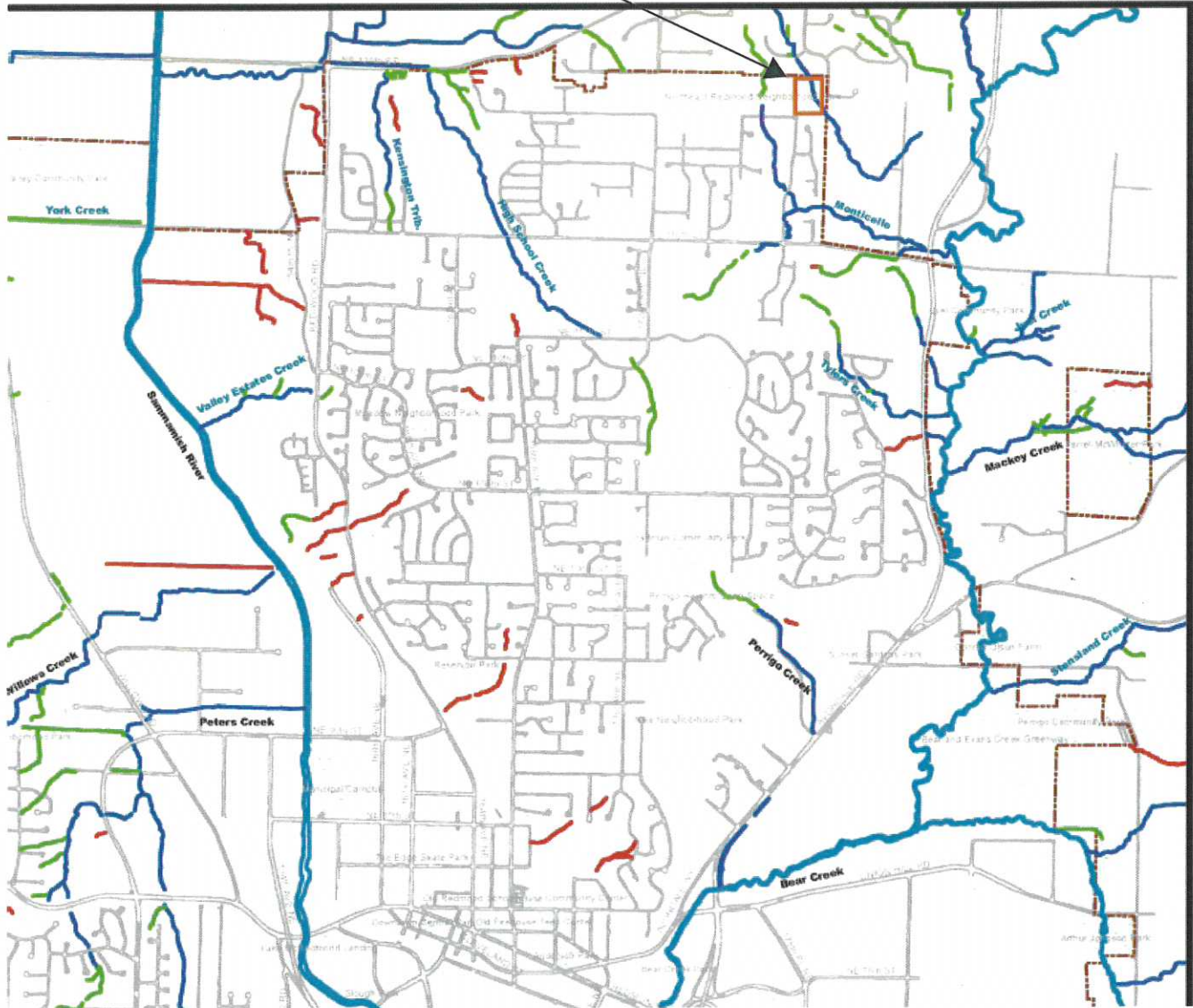
Source: Google Maps. Available at <https://www.google.com/maps>. Accessed July 2, 2014.



FIGURE 1
REGIONAL & VICINITY MAP
EDGEWOOD EAST PROPERTY
REDMOND, WA

Raedeke
Associates, Inc.
9510 Stone Avenue North
Seattle, WA 98103
RAI # 2014-009

EDGEWOOD EAST



City of Redmond

*Critical Areas Map
Effective: September 1, 2012*

Map 64.3 Streams Classification

Legend:

- Class I
- Class II
- Class III
- Class IV

Stream Official USGS Stream Name

Stream Informal Stream Name

Sources
City of Redmond Public Works, Natural Resources Division
City of Redmond GIS Services
Washington Trout / Wild Fish Conservancy
King County GIS

Note: This map shall be used as a general guide representing the approximate location of streams, per RZC 21 64.010(E)(2). The map does not necessarily ensure the presence or absence of streams. In the event of a conflict between the map and the criteria of the Critical Areas Ordinance (CAO), the criteria shall prevail. Consult the CAO (RZC 21 64) for reporting requirements.

Note: Gaps in illustrated streams may indicate culverts, pipes, ponds, etc.
Note: Informal stream names may not conform to USGS policies and may change in the future.



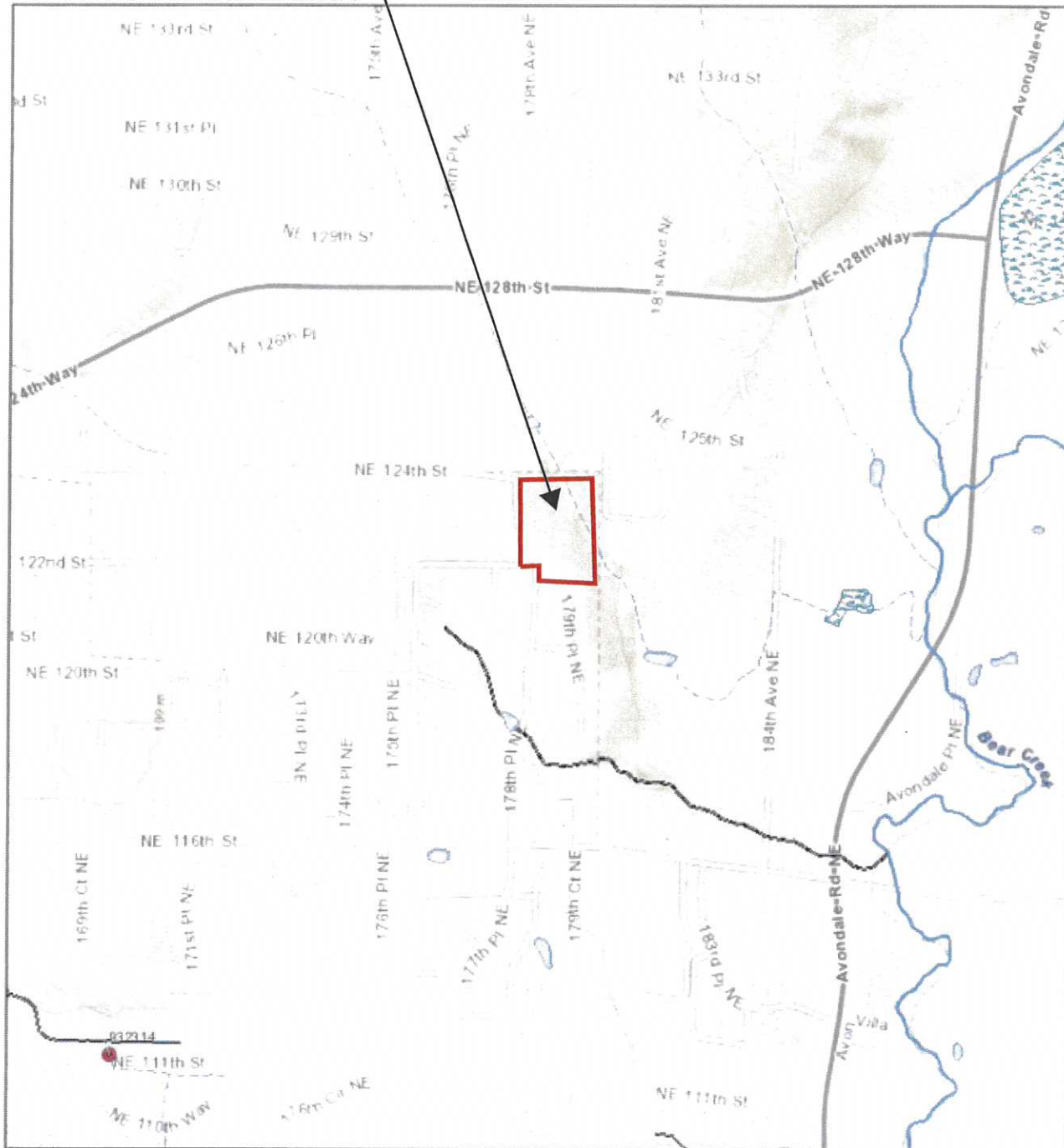
FIGURE 2
REDMOND STREAMS CLASSIFICATION
EDGEWOOD EAST PROPERTY
REDMOND, WA

Raedeke
Associates, Inc.

9510 Stone Avenue North
Seattle, WA 98103

RAI # 2014-009

EDGEWOOD EAST



July 16, 2014

- | | |
|-----------------------------------|-----------------------------------|
| All SalmonScape Species | Total Blockage |
| Total Blockage | Total Blockage, Fishway Present |
| Total Blockage, Fishway Present | Partial Blockage |
| Partial Blockage | Partial Blockage, Fishway Present |
| Partial Blockage, Fishway Present | Unknown Blockage |
| Unknown Blockage | Unknown Blockage, Fishway Present |
| Unknown Blockage, Fishway Present | |

FIGURE 3

WDFW SALMONSCAPE EDGEWOOD EAST PROPERTY REDMOND, WA

Source: Washington Department of Fish and Wildlife. Accessed at <http://apps.wdfw.wa.gov/salmonscape/>. Accessed on July 16, 2014



Raedeke
Associates, Inc.

9510 Stone Avenue North
Seattle, WA 98103

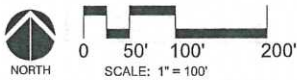
RAI # 2014-009

FIGURE 4
 QUADRANT HOMES
 EDGEWOOD EAST
 CRITICAL AREAS ASSESSMENT
 EXISTING CONDITIONS



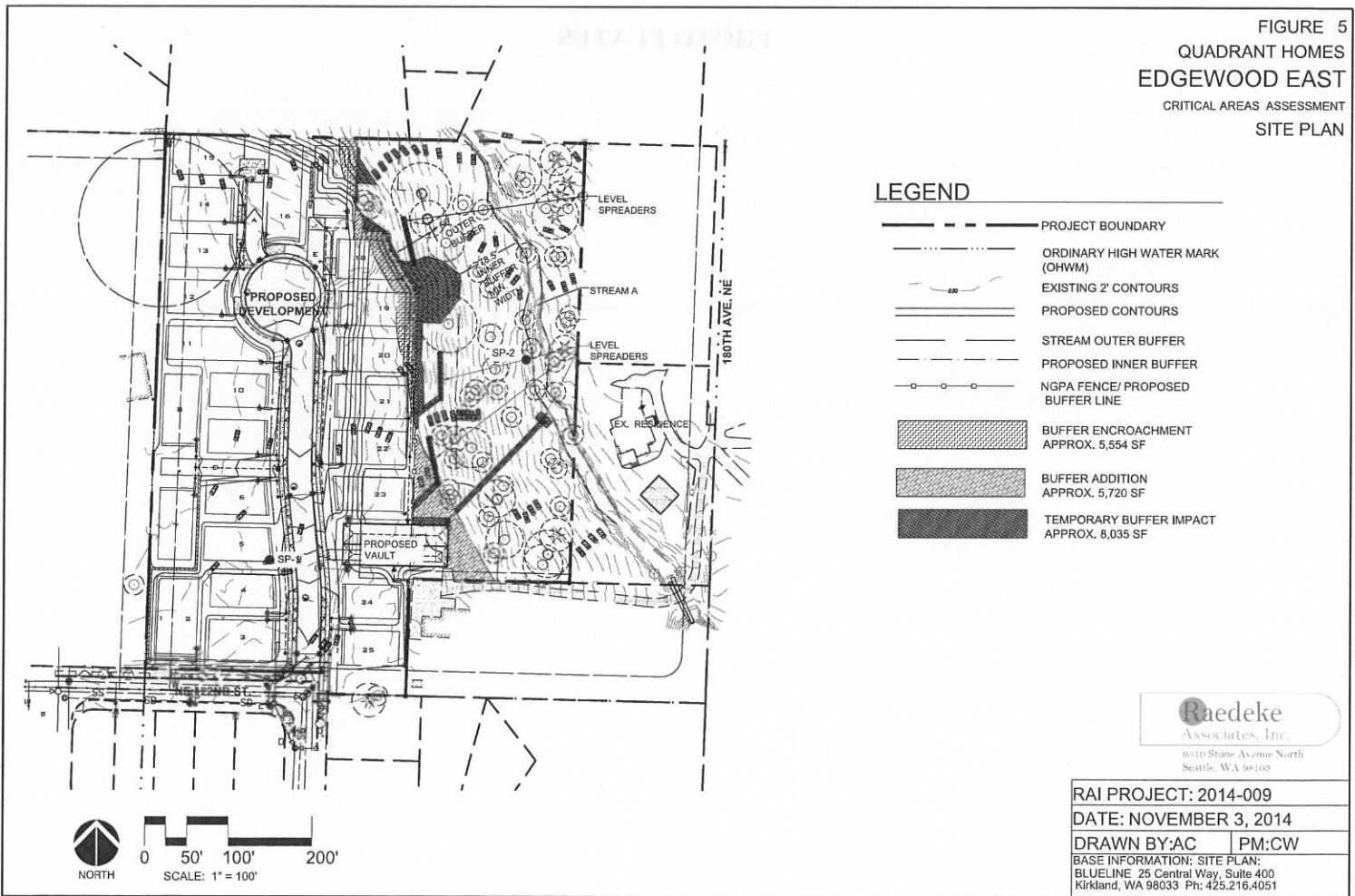
LEGEND

- PROPERTY LINE
- EX. 2 FOOT CONTOURS
- ORDINARY HIGH WATER MARK (OHWM)
- STREAM INNER BUFFER
- STREAM OUTER BUFFER
- SP-# SAMPLE PLOT LOCATIONS
- EXISTING TREES













RAI PROJECT: 2014-009	
DATE: NOVEMBER 3, 2014	
DRAWN BY: AC	PM: CW
<small>BASE INFORMATION: Survey & Site Plan BLUELINE 25 Central Way, Suite 400 Kirkland, WA 98033 Ph: 425.216.4051</small>	

FIGURE 5
 QUADRANT HOMES
 EDGEWOOD EAST
 CRITICAL AREAS ASSESSMENT
 SITE PLAN



LEGEND

-  PROJECT BOUNDARY
-  ORDINARY HIGH WATER MARK (OHWM)
-  EXISTING 2' CONTOURS
-  PROPOSED CONTOURS
-  STREAM OUTER BUFFER
-  PROPOSED INNER BUFFER
-  NGPA FENCE/ PROPOSED BUFFER LINE
-  BUFFER ENCROACHMENT
APPROX. 5,554 SF
-  BUFFER ADDITION
APPROX. 5,720 SF
-  TEMPORARY BUFFER IMPACT
APPROX. 8,035 SF

Raedeke
 Associates, Inc.
 9310 Stone Avenue North
 Seattle, WA 98108

RAI PROJECT: 2014-009	
DATE: NOVEMBER 3, 2014	
DRAWN BY: AC	PM: CW
BASE INFORMATION: SITE PLAN: BLUELINE 25 Central Way, Suite 400 Kirkland, WA 98033 Ph: 425.216.4051	

File: T:\2014\2014-009-Hussey\11x17_2014-009_Hussey.dwg

PHOTO PLATES



Photo 1. View of deeply incised channel in Stream A. February 4, 2014.



Photo 2. Less incised channel in Stream A as the stream passes through the site. February 4, 2014.

Photo Plate 1



Photo 3. Typical stream bed substrate and flow observed at southern end of project site. July 14, 2014.



Photo 4. Typical canopy coverage on the west bank riparian corridor of stream A. July 14, 2014.

Photo Plate 2

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

Project/Site: Hussey Redmond City/County: Redmond/King County Sampling Date: 2/4/14
 Applicant/Owner: Quadrant Homes State: WA Sampling Point: SP 1
 Investigator(s): Chris Wright, Bryce Vanderkolk Section, Township, Range: S25, T26N, R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): <3%
 Subregion (LRR): Northwest forest & coast (LRR-A) Lat: 47 42 34.66 N Long: 122 06 05.75 W Datum: Unknown
 Soil Map Unit Name: Alderwood gravelly sand loam, 6 to 15 percent slopes. 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample plot 1 is located in the southwest portion of the site	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>50</u> x 2 = <u>100</u> FAC species _____ x 3 = _____ FACU species <u>50</u> x 4 = <u>200</u> UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>300</u> (B) Prevalence Index = B/A = <u>3.0</u>
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>Rubus armeniancus (Himalayan blackberry)</u>	<u>50</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
50 = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Phalaris arundinacea (reed canarygrass)</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
50 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks: Prevalence Index is 3.0, lack of hydric soil or hydrology indicates that plant community is not hydrophytic.				

SOIL

Sampling Point: SP 1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-14+	10YR 4/2	100					Sandy loam	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: Soils at sample plot resemble the mapped Alderwood series.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____

Wetland Hydrology Present? Yes No

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

Remarks: No evidence of hydrology within 14 inches of ground surface

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

Project/Site: Hussey Redmond City/County: Redmond/King County Sampling Date: 2/4/14
 Applicant/Owner: Quadrant Homes State: WA Sampling Point: SP 2
 Investigator(s): Chris Wright, Bryce Vanderkolk Section, Township, Range: S25, T26N, R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 8%
 Subregion (LRR): Northwest forest & coast (LRR-A) Lat: 47 42 34.66 N Long: 122 06 05.75 W Datum: Unknown
 Soil Map Unit Name: Alderwood gravelly sand loam, 6 to 15 percent slopes. 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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample plot 2 is located along west side of stream	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
4. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet:
1. <u>Rubus armenianicus (Himalayan blackberry)</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Rubus spectabilis (salmon raspberry)</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	OBL species _____ x 1 = _____
3. <u>Acer circinatum (vine maple)</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species <u>40</u> x 3 = <u>120</u>
5. _____	_____	_____	_____	FACU species <u>60</u> x 4 = <u>240</u>
	<u>70</u>	= Total Cover		UPL species _____ x 5 = _____
Herb Stratum (Plot size: _____)				Column Totals: <u>100</u> (A) <u>360</u> (B)
1. <u>Polystichum munitum (sword fern)</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	Prevalence Index = B/A = <u>3.6</u>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>30</u>	= Total Cover		
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. _____	_____	_____	_____	<input type="checkbox"/> 2 - Dominance Test is >50%
	_____	= Total Cover		<input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$
% Bare Ground in Herb Stratum <u>0</u>				<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
Remarks:				<input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹
				<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

SOIL

Sampling Point: SP 2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16+	10YR 4/2 & 4/3	100					Sandy loam	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: Soils at sample plot resemble the mapped Alderwood series.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): _____	

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

Remarks: No evidence of hydrology within 16 inches of ground surface

APPENDIX B:

Stream Summary Sheet and Habitat Assessment Form

<p>Project Name: _____</p> <p>Location: _____</p> <p>Date: _____</p> <p>Assessor: _____</p>	
<p>Stream Name: _____</p> <p>Stream ID: _____</p> <p>Stream Type: _____</p>	
<p>Stream Length: _____</p> <p>Stream Width: _____</p> <p>Stream Depth: _____</p>	
<p>Stream Flow: _____</p> <p>Stream Velocity: _____</p> <p>Stream Temperature: _____</p>	
<p>Stream Bank Stability: _____</p> <p>Stream Bank Composition: _____</p> <p>Stream Bank Slope: _____</p>	
<p>Stream Bank Vegetation: _____</p> <p>Stream Bank Shading: _____</p> <p>Stream Bank Erosion: _____</p>	
<p>Stream Bank Sedimentation: _____</p> <p>Stream Bank Debris: _____</p> <p>Stream Bank Obstructions: _____</p>	
<p>Stream Bank Encroachment: _____</p> <p>Stream Bank Development: _____</p> <p>Stream Bank Alteration: _____</p>	
<p>Stream Bank Impact: _____</p> <p>Stream Bank Mitigation: _____</p> <p>Stream Bank Recommendation: _____</p>	
<p>Stream Bank Assessment: _____</p> <p>Stream Bank Score: _____</p> <p>Stream Bank Status: _____</p>	
<p>Stream Bank Notes: _____</p> <p>Stream Bank Photos: _____</p> <p>Stream Bank Attachments: _____</p>	
<p>Stream Bank Summary: _____</p> <p>Stream Bank Conclusion: _____</p> <p>Stream Bank Recommendation: _____</p>	



STREAM SUMMARY SHEET

Stream Summary		Buffer Summary			Riparian Corridor Summary			
Label ¹	Type ²	Linear Feet ³	Required ⁴	Proposed ⁵	Averaging ⁶	Disturbed Area ⁷	Filled Area ⁸	Mitigation Area ⁹
A	II	425	150	varies 125 to 205	83,914 standard	8,035	5,554	5,720
					84,080 averaged			

¹ Stream A, B, C, etc.
² Stream type per City stream classification system.
³ Length of stream on the property.
⁴ Required buffer width in feet per RCDG.
⁵ Proposed buffer width in feet.
⁶ Note if buffer averaging is used. If so, identify minimum and maximum buffer widths in feet as well as area in square feet contained within the buffer prior to and after averaging.
⁷ Area of buffer that is disturbed in square feet.
⁸ Area of buffer to be filled in square feet, such as for a road crossing.
⁹ Location and size in square feet of riparian corridor mitigation.



CITY OF REDMOND HABITAT UNIT ASSESSMENT FORM

HABITAT UNIT: Edgewood East Short Plat
LOCATION: Section 25, T26N, R5E, W.M.
TOTAL SCORE: 16

Habitat Parameter	Scoring Criteria	Habitat Unit Score
Size	<ul style="list-style-type: none"> • >50 acres = 3 points • 10-50 acres = 2 points • 0-10 acres = 1 point 	1
Vegetation Community Types	<ul style="list-style-type: none"> ≥ 4 types = 3 points • 2-3 types = 2 points • 1 type = 1 point • None = 0 points 	2
Community Interspersion	<ul style="list-style-type: none"> • High = 3 points • Medium = 2 points • Low = 1 point • None = 0 points 	1
Priority Species Presence	<ul style="list-style-type: none"> • Threatened & Endangered Species = 3 points • Candidate Species = 2 points • Monitor Species = 1 point • None = 0 points 	2
Priority Species Habitat Use	<ul style="list-style-type: none"> • Breeding = 3 points • Roosting = 2 points • Foraging = 1 point • None = 0 points 	1
Habitat Continuity	<ul style="list-style-type: none"> • Links protected habitats = 3 points • Links unprotected habitats = 2 points • Extends habitat corridor = 1 point • None = 0 points 	3
Forest Vegetation Layers	<ul style="list-style-type: none"> • 3 layers = 3 points • 2 layers = 2 points • 1 layers = 1 point • None = 0 points 	3
Forest Age	<ul style="list-style-type: none"> • Mature = 3 points • Pole = 2 points • Seedling/Shrub = 1 point • None = 0 points 	2
Invasive Species Presence	<ul style="list-style-type: none"> • 0-25% = 3 points • 26-50% = 2 points • 51-75% = 1 point • 75-100% = 0 points 	1

**CITY OF REDMOND
HABITAT UNIT ASSESSMENT FORM**

VEGETATION COMMUNITY TYPES:

Deciduous forest, open shrub

INVASIVE PLANTS:

Himalayan and cutleaf blackberry, reed canarygrass

HABITAT FEATURES (snags, perches, downed logs, etc):

Few small snags (less than 10 inches dbh). Downed logs widely scattered, mostly less than 10 inches diameter, with one 15 inches diameter noted over stream channel.

WILDLIFE OBSERVATIONS (direct or indirect):

Foraging excavations by pileated woodpecker in one snag. Otherwise, a few species of breeding and resident small birds typical of lowland forests were observed. Deer were observed within the riparian corridor. No reptiles or amphibians were observed.

THREATS TO HABITAT INTEGRITY:

Invasive species, particularly Himalayan blackberry and reed canarygrass.
Human and domestic pet activity from surrounding residences.

OTHER NOTES:

