Appendix C.

Wetland Evaluation for City of Woodinville Sustainable Development Program

Appendix C-1.

Woodinville Additional Wetland Reconnaissance Survey, Jones & Stokes

Jones & Stokes

Technical Memorandum

Date: February 12, 2007

To: Cindy Baker, Interim Director, Development Services, City of Woodinville

From: Torrey Luiting, Wetland Restoration Biologist, Jones & Stokes

cc: Lisa Grueter, Senior Planner, Jones & Stokes

Subject: Woodinville Additional Wetland Reconnaissance Survey

Methods

On February 8, 2007, Jones & Stokes conducted an independent wetland reconnaissance with the portion of Woodinville, Washington currently zoned as R-1, as depicted on the attached Figure. The purpose of the reconnaissance was to identify possible and potential wetland areas based on a visual inspection from public roadways and from signed private roadways.

During the reconnaissance, Jones & Stokes placed particular emphasis on the Hillside Drainages basin, Golf Course Basin, the School basin, the Daniels Creek basin, and the Woodin Creek basin within the R-1 area (see attached Figure). We also drove the roadways throughout the Lake Leota basin, which had been previously surveyed for the City in October 2006 by Cooke Scientific.

Identification of 'possible' and 'potential' wetland areas was based on visual evidence of hydrophytic vegetation, as outlined in *Corps of Engineers Wetland Delineation Manual* (1987 Manual) (Environmental Laboratory 1987) and *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997). Wetland functions and associated classification was based on the Washington State Wetlands Rating System for Western Washington (Hruby 2004) and the City of Woodinville's Critical Areas Development Standards (Chapter 21.24.320).

Under normal conditions, hydrophytic vegetation is considered prevalent if greater than 50% of the dominant species from each stratum (tree, shrub, vine, and herbaceous) are classified as obligate wetland (OBL), facultative wet wetland (FACW), and/or facultative wetland (FAC) according to the U.S. Fish and Wildlife Service (USFWS) publication National List of Plant Species that Occur in Wetlands (Reed 1988). These classifications are based on moisture

tolerance, as indicated in Table 1. Dominant species represent 20% aerial cover or more. Non-dominants (i.e., species with less than 20% aerial cover) are also noted when dominants are unclassified or primarily FAC.

Table 1. Plant Species Indicator Category Definitions

Category	Definition
Obligate (OBL)	Plants that almost always occur in wetlands (estimated probability > 99%) under natural conditions.
Facultative Wetland (FACW)	Plants that usually occur in wetlands (estimated probability 67 to 99%) but are occasionally found in non-wetland areas.
Facultative (FAC)	Plants that are equally likely to occur in wetlands or non wetlands (estimated probability 33 to 67%).
Facultative Upland (FACU)	Plants that usually occur in non-wetlands (estimated probability 67 to 99%).
Upland (UPL)	Plants that almost always occur in non-wetlands (estimated probability > 99%) under natural conditions.

Source: Reed 1988

We labeled areas identified during our reconnaissance as 'potential wetland' areas or 'possible wetland' areas; we also indicated areas were our visual reconnaissance was limited and our views restricted, but in which there may be wetlands.

'Potential wetland' areas observed by Jones & Stokes were areas in which the dominant vegetation was composed of species rated FAC or wetter, and in which non-dominates were also generally rated FAC or wetter and/or there was visual evidence of saturated soils or surface ponding at the time of our field investigation. These areas are most likely wetland, but again, site-specific soils and hydrology investigations would have to be performed during the growing season to definitively document all three required parameters (hydrophytic vegetation, hydric soils, and wetland hydrology during the growing season) necessary to be considered a jurisdictional wetland.

'Possible wetland based on vegetation' areas were areas in which the dominant vegetation was composed of species rated FAC or wetter, but in which non-dominates were generally rated FAC or drier. These areas may be wetland, but site-specific soils and hydrology investigations would have to be performed during the growing season to definitively determine whether or not the area meets all three wetland criteria (hydrophytic vegetation, hydric soils, and wetland hydrology during the growing season) and would thus be considered a jurisdictional wetland.

'Visual reconnaissance limited' areas were areas in which some hydrophytic vegetation was visually discernible from a distance (e.g. the dominant trees), but where distance from the

roadways and/or other visual barriers prevented a close enough inspection to visually determine non-dominant vegetation species and/or hydrologic conditions. While these areas may contain wetlands, determining their plant communities and/or soils and hydrology conditions would have required access through and onto private property.

Results

Jones & Stokes identified seven 'potential wetland' areas, mostly located within the Hillside and School Drainage basins (see attached Figure). The majority of the 'potential wetland' areas are located in topographic depressions and are clearly dominated by the typical Pacific Northwest forested wetland combination of hydrophytic trees and shrubs, most commonly red alder (*Alnus rubra*, FAC), black cottonwood (*Populus balsamifera*, FAC), and western red cedar trees (*Thuja plicata*, FAC) interspersed with Douglas fir (*Pseudotsuga menziesii*, FACU) and big-leaf maple (*Acer macrophyllum*, FACU) trees along the higher outer edges. The understory of these areas is typically dominated by salmonberry (*Rubus spectabilis*, FAC+) and sword fern (*Polystichum munitum*, FACU). Himalayan blackberry (*Rubus armeniacus*, FACU) was also occasionally present along the outer edges. Surface saturation and/or ponded surface water was present in several of these areas at the time of our field reconnaissance. However, none of these areas appeared to support a dominance of western red cedar and/or Sitka spruce (*Picea sitchensis*, FAC) that is indicative of prolonged surface saturation and a 'forest swamp' community. A site-specific field investigation of soil profiles and hydrology is necessary to determine whether or not these areas meet all three wetland criteria and thus would be regulated as wetlands. Given their estimated relative sizes, landscape positions, and apparent vegetation classes (forested and scrub-shrub, based on Cowardin et al. 1979), these 'potential wetland' areas would likely be rated as Category 2 or 3 wetlands according to the City of Woodinville's Critical Areas Development Standards (Chapter 21.24.320).

Jones & Stokes also identified eight 'possible wetland based on vegetation' areas (see attached Figure). Red alder trees similarly dominated the 'possible wetland' areas with understories dominated by salmonberry. These areas generally had a greater proportion of subdominant vegetation that can be characteristic of drier habitats, including big-leaf maple trees, sword fern, and salal (*Gaultheria shallon*, FACU). However, these drier species sometimes do occur on topographically elevated hummocks interspersed within forested and scrub-shrub wetlands. A site specific investigation during the growing season would be required in these areas to determine whether there is sufficient dominance by hydrophytic vegetation to meet the wetland vegetation criteria, as there may be additional hydrophytic herbaceous vegetation present that is not visible during February. In addition, field investigation of soil profiles and hydrology is necessary to determine whether or not these areas meet all three wetland criteria and thus would be regulated as wetlands. If these 'possible wetland' areas are found to indeed be jurisdictional wetlands, they would likely be rated as Category 2 or 3 wetlands according to the City of Woodinville's Critical Areas Development Standards (Chapter 21.24.320) due to their estimated relative sizes, landscape positions, and apparent vegetation classes (forested and scrub-shrub

predominately).

Finally, Jones & Stokes identified ten areas where our visual reconnaissance was limited due to the distance of accessible roadways from undeveloped areas. In many cases, there were also visual barriers (e.g. dense tree canopy, topography, buildings/fences) preventing clear sight-lines into these areas. In these areas, hydrophytic tree species were present (generally red alder and black cottonwood), but we could not determine whether or not they were the dominant species. Similarly, we could also not determine whether the understory species were typical hydrophytes such as salmonberry, or typical upland understory species. A site-specific investigation during the growing season would be required to determine whether these areas contain wetlands.

Conclusions

The combination of this reconnaissance, the City's wetland inventory, and the survey conducted by Cooke Scientific, provides a thorough reconnaissance level survey of the R-1area, suitable for the planning level efforts associated with the City's Sustainable Development Project. For the purposes of inventorying the extent and general nature of wetlands, the level of effort expended and the level of detail provided are typical and appropriate.

The data collected by both Jones & Stokes and Cooke Scientific indicate that the wetlands present within the R-1 area are typical forested and scrub-shrub wetlands, either depressional, riverine flow-through (associated with Cold Creek), or lacustrine fringe (surrounding Lake Leota). The wetlands are dominated by the typical wetland trees and shrubs, which are commonly found throughout western Washington, particularly within urban municipalities in which much of the original forests and wetlands were cleared for residential and commercial development. These types of wetlands are generally seasonally saturated to ponded and provide a variety of wildlife habitat functions, particularly for birds and small mammals, as well as water quality improvement and hydrologic (stormwater retention) functions typical of depressional wetlands within urbanized areas. Given the prevalence of mapped, 'possible', and 'potential' wetlands between 162nd Avenue NE and 166th Avenue NE, these features may be hydrologically linked to each other via surface and/or subsurface connections within the School Basin. However, none of the mapped, potential, or possible wetlands identified appear to be of exceptional local significance, or of irreplaceable ecological functions.

While site-specific investigations and field delineations would provide an exact accounting of wetlands, such an effort is logistically difficult since investigations would require every property owner to grant site access and agree to have a legally regulated feature (wetlands) and its buffer delineated and recorded on his or her property. However, such site-specific analysis can occur at the time of proposed development applications.

The planning-level wetlands reconnaissance conducted to date will help provide a guide to local wetland locations as property owners request development over time. Any proposed development on parcels containing or adjacent to wetlands, regardless of residential density

zoning, would require a site-specific delineation to determine the exact wetland extent and boundaries. Development applications would then be required to provide that the delineated wetlands be protected by standard minimum buffers of 100 and 50 feet for Class 2 or 3 wetlands, respectively (per City of Woodinville's Critical Areas Development Standards Chapter 21.24.330). Unavoidable impacts to a wetland or its buffer would require federal, state, and local permits, as well as compensatory mitigation for 2 acres of wetland mitigation per acre of impact for Class 2 wetlands and 1.5 acres of mitigation per acre of impact for Class 3 wetlands, per Chapter 21.24.250 (City of Woodinville Critical Areas Development Standards).

Qualifications

These conclusions are based on my best professional judgment as a wetland professional and field biologist. I have over 10 years of professional experience in wetlands, including reconnaissance, field delineation, wetland functions and values assessment, fish and wildlife habitat assessments, and project permitting. My field experience spans both Western and Eastern Washington wetlands, as well as in Northern Oregon. Prior to joining Jones & Stokes, I was an Environmental Coordinator for Seattle District, Corps of Engineers projects, worked with the Corps Regulatory Branch on Section 10 and Section 404 permits, and was a project manager for 5 years at a local wetland-consulting firm. I have been an invited panelist for the University of Washington's Wetland Science and Management Certification Program, speaking about the 'real-world' relationship between landscape ecology and wetland science. I have authored numerous project-specific biological and environmental assessments for a wide variety of projects, analyzing immediate and cumulative impacts associated with projects across a range of scales. At Jones & Stokes, I specialize in project management and permitting of wetland restoration projects, in addition to wetland assessment and delineation projects.

I am also a Distance Learning instructor for Seattle Central Community College in Environmental Science. I hold a Masters of Science degree from the University of Washington School of Fisheries (1996), with an emphasis in wetland biology, and am a Summa Cum Laude graduate of the University of Wisconsin, Green Bay, in Environmental Science (1992).

References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* U.S. Fish and Wildlife Service PUBL. FWS/OBS-79/31. 103p.

Ecology (Washington Department of Ecology). 1997. Washington Department of Ecology. *Washington State Wetlands Identification and Delineation Manual.* Washington Department of Ecology Publication #96-94. Olympia, WA.

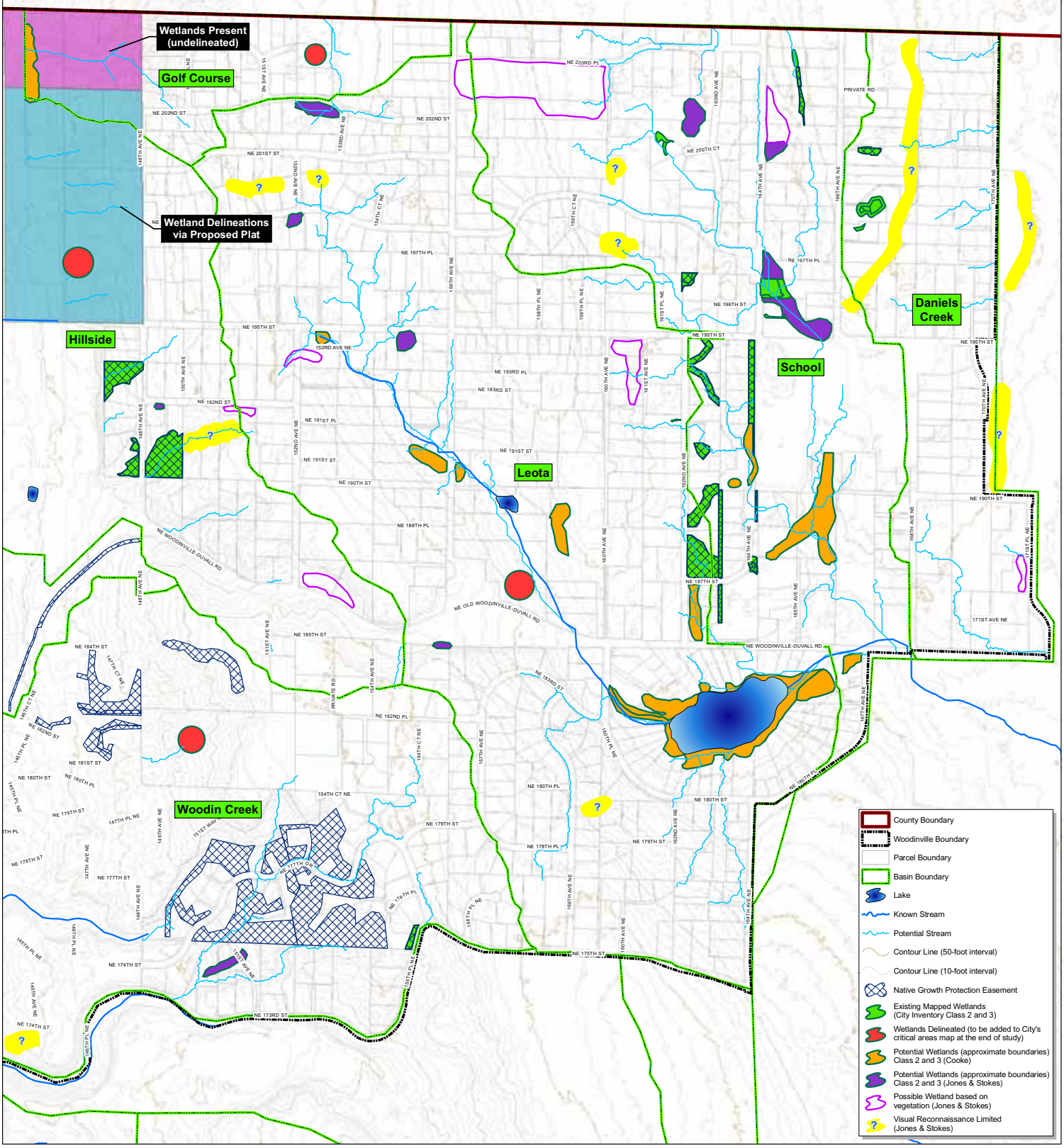
Environmental Laboratory. 1987. *U.S. Army Corps of Engineers Wetland Delineation Manual.* Technical Report Y-87-1. U.S. Army Waterways Experiment Station. Vicksburg, MS.

Hruby, T. 2004. *Washington State Wetlands Rating System for Western Washington.* Washington Department of Ecology. Olympia, WA.

Reed, P.B., Jr. 1988. *National List of Plant Species that Occur in Wetlands (Northwest Region 9)*. USDI Fish and Wildlife Service Biological Report 88 (26.9). 89 pp.

City of Woodinville

Sustainable Development Project



Compilation of Wetlands Reconnaissance and Inventories

0 500 1,000
Feet

City of Woodinville
17301 - 133rd Ave NE
Woodinville, WA 98072
www.woodinville.wa.us
425-489-2700

Disclaimer
Any use of or reliance upon the information contained in this document is at the user's sole risk. The City of Woodinville does not warrant the accuracy, currency, completeness or quality of such information. The City expressly disclaims any warranty of merchantability or fitness for any particular purpose with respect to such information. The City further disclaims all responsibility or liability for any damage, injury or loss resulting therefrom.

Appendix C-2.
Woodinville Wetland Survey, Cooke Scientific

COOKE SCIENTIFIC
4231 NE 110TH ST, SEATTLE, WA 98125
PHONE: (206) 695-226 FAX: 206-368-5430
COOKESS@AOL.COM WWW.COOKESCIENTIFIC.COM

Memorandum

TO: John Lombard, Steward and Associates

FROM: Sarah Spear Cooke

DATE: October 26, 2006

SUBJECT: Woodinville Wetland Survey

Enclosed please find, a map of wetlands that Dustin Hinson and I evaluated for the City of Woodinville's R-1 environmental report and a table with accompanying information for each wetland we mapped. The table includes a hydrogeomorphic classification, the Cowardin classification (where known), an estimated rating using the Washington State Department of Ecology's Wetland rating for Western Washington (Hruby 2004), approximate acreage in two cases, whether or not this information was verified in the field, and miscellaneous information on the location and other characteristics of the wetland.

Our survey was not comprehensive. Given budget and time constraints and the approved scope for the R-1 report, we focused on wetlands that were part of the area draining to Lake Leota, particularly those that have a direct hydrologic connection to the lake, at least seasonally. We also examined some of the larger wetlands in the vicinity of Leota Junior High School, where the City's maps generally show the greatest concentration of wetlands in the R-1 area. Access was limited to public property or where private property owners happened to be present and gave us access during our time in the field.

While our survey was limited by these constraints, I am confident that we evaluated the wetlands in the R-1 zone of most significance for the environmental report, and that our general conclusions would still hold after a more detailed survey. All of the wetlands we observed have been substantially degraded by past alterations and impacts from surrounding development. We found no Category I wetlands and none that were likely of great significance to fisheries resources downstream. No wetland in the R-1 zone has high habitat values, based on the Washington Department of Ecology's rating system; most have low habitat scores, although some around Lake Leota would likely be rated as having moderate habitat values (scores between 20 and 28 in Ecology's system). Wetlands in the Lake Leota basin are still important for protecting the lake's water quality, both through filtration of pollutants and detention of stormwater to reduce erosion downstream.

Our judgments are based on extensive professional experience, which in my case includes more than 19 years in wetlands ecological research and environmental consulting. I am a certified "Wetland Scientist" by the Society of Wetland Scientists and am one of three fellows

recognized by the Society of Wetland Scientists to date. I have taught “Wetland Ecology” for the Wetland Certification Program at the University of Washington, “Wetland Vegetation Identification” at the University of Washington and at Portland State, “Wetland Delineation” using the 1987 and Washington State Department of Ecology’s Wetland Delineation Method for the U.S. Army Corps of Engineers agency training classes, and “Wetland Rating in Western Washington” for the Washington State Department of Ecology using the Wetland Rating Method for Western Washington (Hruby 2004). I am the author/editor of A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon (Seattle Audobon Society/Washington Native Plant Society 1997) and a contributing author to Wetlands and Urbanization: Implications for the Future (CRC Press 2004). I also conducted scientific research on wetland ecosystems for the Department of Ecology’s Western Washington Stormwater Manual.

City of Woodinville R-1 Zone Wetland Inventory

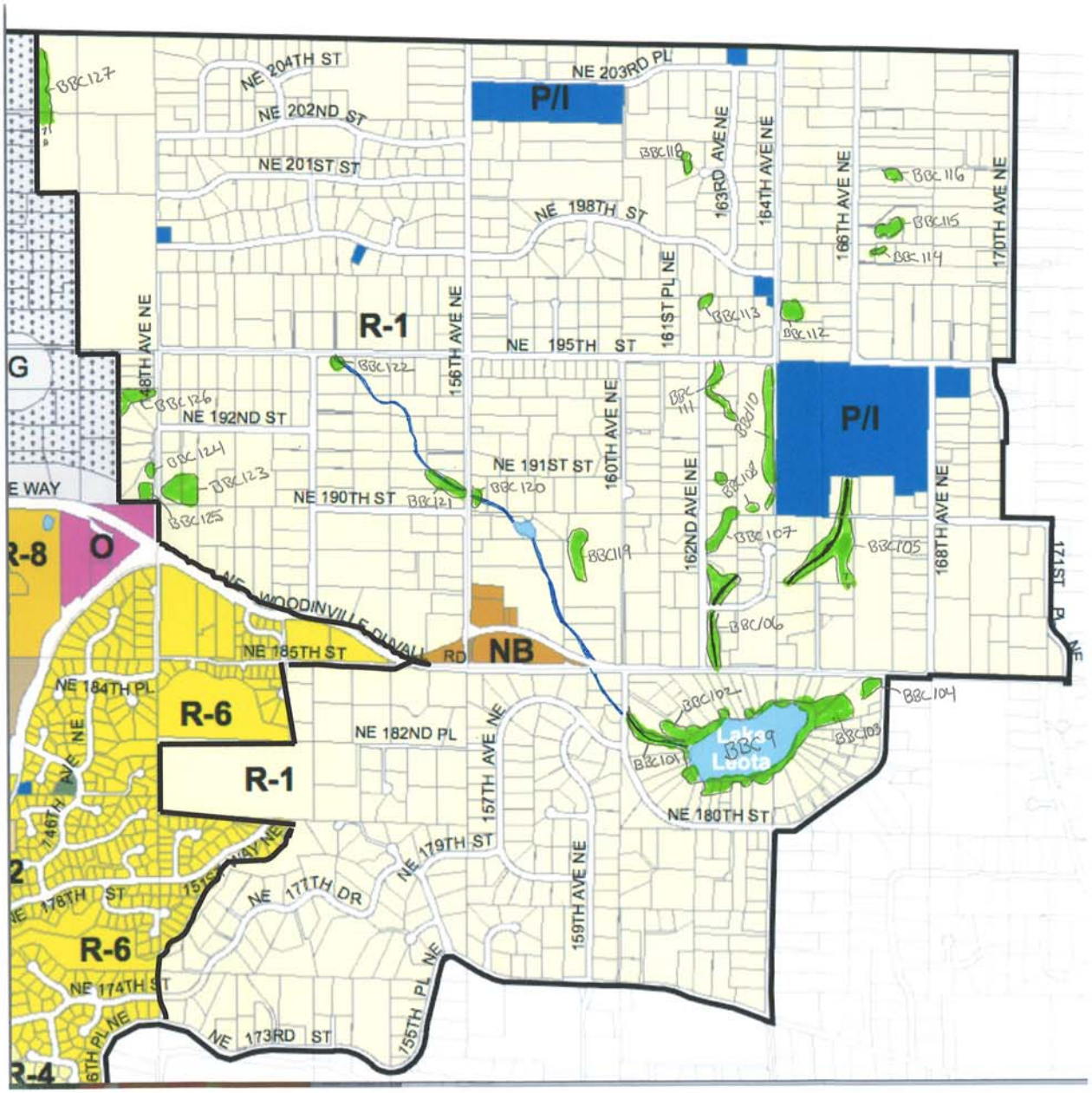
Wetland code	Approx acreage	Rating*[1]	HGM class	Cowardin Class	Field Verified*[2]	Location and Misc Notes
BBC 9	± 13	2	Lacustrine fringe	PUB PAB, PEM, PSS	Yes	The exact extent of this wetland is not known. It is clear it runs the periphery of the open water of Lake Leota and that is within NE 180th St and NE Woodinville Duvall Road, but extends to a larger area on some lots. BBC101, 102, and 103 have been described (in city files) and are extensive and so identified separately although they are continuous with this wetland
BBC 101	0.5	2	Riverine flow-through	PFO PSS PEM	Yes	See BBC 9. This wetland is continuous with Coldwater creek as it enters Lake Leota. The creek only flows periodically now. It used to flow all year long.
BBC 102	-	2	Lacustrine fringe	-	No	See BBC 9. This wetland is continuous with BBC 9 but extends northwest from the NW corner of Lake Leota onto two lots.
BBC 103	-	2*[3]	Lacustrine fringe	-	No, but is present	See BBC 9. This wetland is located on the northeast corner of Lake Leota and is the largest scrub shrub/forested wetland in the system.
BBC 104	-	2*[3]	Riverine flow-through	PSS PFO	Yes	Located at the NE corner of the intersection of NE 180th St and NE Woodinville Duvall Road. Enters a culvert that heads NE under the Woodinville-Duvall Road. Is the outlet to Cold Creek.
BBC 105	-	2*[3]	Riverine flow-through	PSS PFO	Yes	Located south of the high school, north and south of NE 190th St. There is a seasonal channel that flows from a culvert that originates at the high school and heads south and disappears into a culvert just east of 163rd Ave NE.

*[1]Using the WSDOE Wetland Rating for Western Washington (Hruby 2004)
*[2] Wetland may be present but they have not been verified as part of this study. Their size and location comes from City database and should be field verified.
*[3] Estimated rating. The full rating form should be completed in order to verify this estimated rating

Wetland code	Approx acreage	Rating*[1]	HGM class	Cowardin Class	Field Verified*[2]	Location and Misc Notes
BBC 106	-	2*[3]	Riverine flow-through	PFO PSS PEM	Yes	This wetland is east of 162nd Ave NE. A seasonal stream flows into the wetland from a culvert, travels down the riparian corridor, passes under NE 187th Street, and passes back into a culvert under Woodinville-Duvall Road.
BBC 107	-	3*[3]	Depressional outflow	-	No No access	This wetland is located east of 162nd Ave NE. There was no access and so its characteristics are not known. It is believed it is fed via a culvert and exits into a culvert that then feeds into BBC106, but this is not confirmed.
BBC 108	-	-	Depressional closed	PEM	YES	This is a Stormwater pond with an emergent fringe of vegetation.
BBC 109	-	-	Depressional closed	-	NO No access	This wetland is located east of 162nd Ave NE. There was no access and so its characteristics are not known.
BBC 110	-	3*[3]	Riverine flow-through	PEM PSS	YES	Located adjacent to the western edge of the play fields of Leota Junior High. This channel is mostly exposed gravel with a few patches of scattered wetland in areas where water pools. The channel meets up with culverted flows from the high school and heads south.
BBC 111	-	3*[3]	Riverine flow-through	PSS	YES not full access	This wetland is located at the SE corner of the intersection of NE 195th St and 162nd Ave NE. It begins at a culvert under NE 195th St and heads south and west to the edge of 162nd Ave NE, then heads south and east. Access was not possible but it is believed it passes into a culvert at that point.
BBC 112	-	-	Depressional closed	-	No	This wetland is located east of 164th Ave NE.
BBC 113	-	-	Depressional closed	-	No no access	This wetland is located in the middle of a block west of 164th Ave NE and between NE 195th St and NE 198th St.
BBC 114	-	-	Depressional closed	-	No no access	This wetland is located east of 166th Ave NE.
BBC 115	-	-	Depressional closed	-	No no access	This wetland is located east of 166th Ave NE.

Wetland code	Approx acreage	Rating*[1]	HGM class	Cowardin Class	Field Verified*[2]	Location and Misc Notes
BBC 116	-	-	Depressional closed	-	No no access	This wetland is located east of 166th Ave NE.
BBC 117	-	-	Depressional outflow	-	No no access	This wetland is located east of 164th Ave NE and west of 166th Ave NE in the middle of a block.
BBC 118	-	-	Depressional closed	-	No no access	This wetland is located west of 163rd Ave NE off of a cul-de-sac that is NE 200th Ct.
BBC 119	-	-	Depressional outflow	-	No no access	This wetland is located west of 160th Ave NE.
BBC 120	-	-	Depressional outflow	PEM PSS	Yes	This wetland is located east of 156th Ave NE. Most of the area is a gravel-filled detention facility that appears to infiltrate stormwater. Only a small amount of wetland is present within this facility. More investigation is needed.
BBC 121	-	-	Riverine flow-through	PFO PSS	Yes partial access	This wetland is located west of 156th Ave NE. Cold Creek enters the wetland to the NW and exits to the SE under 156th Ave NE. It is a heavily forested cedar wetland.
BBC 122	-	-	Depressional outflow	PEM	Yes from the road	This headwater wetland starts in the mowed lawn of the property just south of NE 195th St.
BBC 123	-	-	Depressional closed	-	No	This wetland is located across two lots east of 148th Ave NE and south of NE 192nd St.
BBC 124	-	-	Depressional closed	-	No	This wetland is located west of 148th Ave NE.
BBC 125	-	-	Depressional closed	-	No	This wetland is found on two lots west of 148th Ave NE.
BBC 126	-	-	Depressional closed	-	No	Wetland located west of 148th Ave NE.
BBC 127	-	-	Slope and Depessional outflow	PEM PSS	yes	This wetland is located at the toe of the slope east of 148th Ave NE just south of the Snohomish County border. It is located mostly within a ravine.

Woodinville R-1 Wetlands Map



Wetlands*

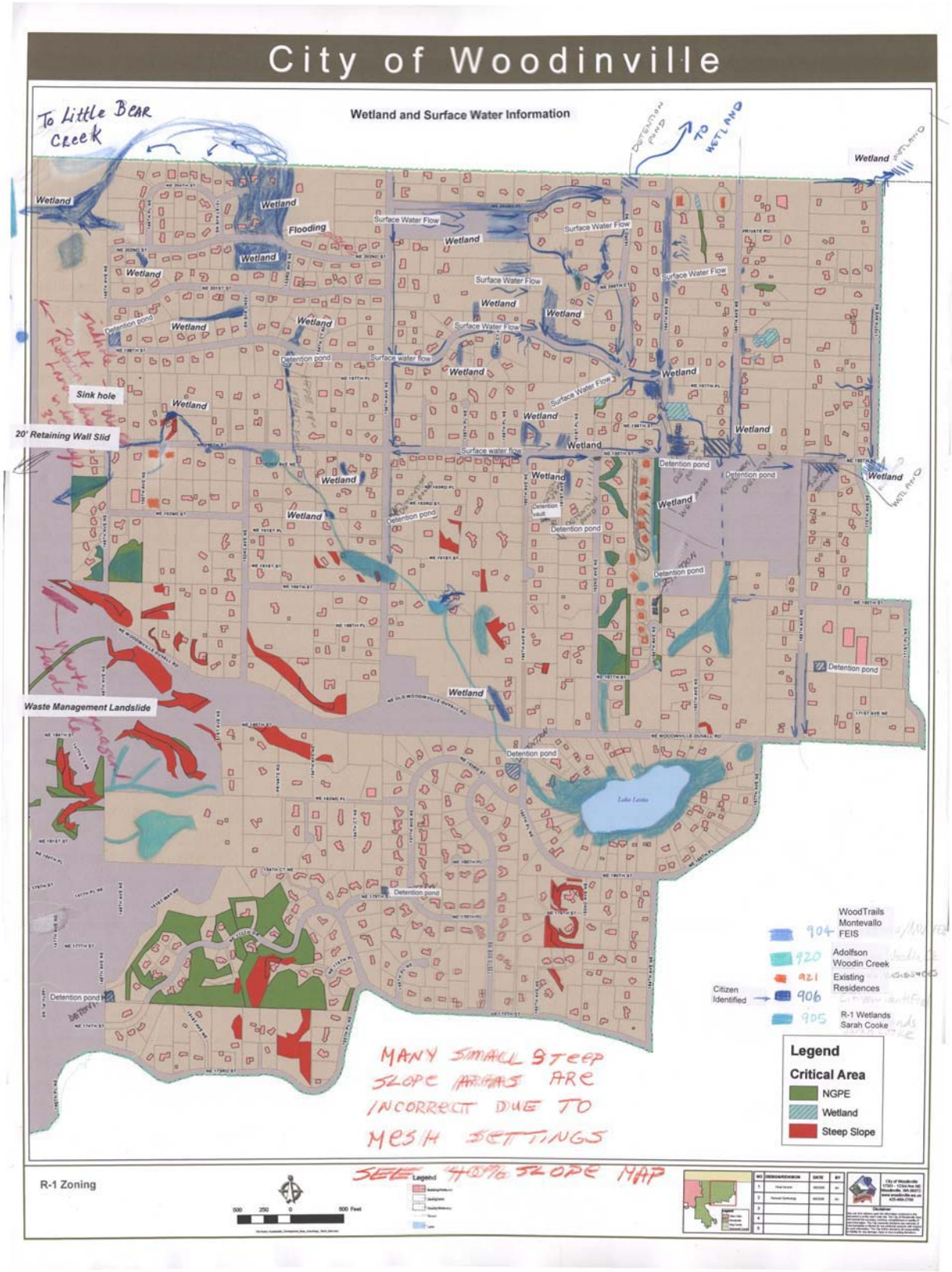
Cold Creek Tributary

Unnamed Tributaries

R-1 Boundary

*Note: All wetlands location and boundaries are approximate. These should be surveyed.

Appendix C-3.
Citizen Advisory Panel Supplied Map



Appendix C-3. Citizen Advisory Panel Supplied Map

This map was supplied by members of the Citizens Advisory Panel (CAP). The Compilation Map in Appendix C-1 identifies many of the same potential wetlands. Some of the CAP identified areas may be located in areas less visible from public roadways due to location of homes, fences, and intervening vegetation, and would require verification following access authorization by private property owners.