City of Tukwila
Jim Haggerton, Mayor
Department of Community Development
Jack Pace, Director

MEMORANDUM

October 10, 2008

TO: City of Tukwila Planning Commission Members

FM: Carol Lumb, Senior Planner

RE: Proposed Shoreline Residential Environment Buffer Width

Issue:

What factors were considered in proposing the buffer for single family residential areas along the shoreline?

Regulatory Context:

The majority of the residential areas along the shoreline are currently governed by the King County Shoreline Master Program (SMP) and regulations found in KCC 25.16, as these areas were annexed to Tukwila after the City adopted its SMP. The King County shoreline regulations establish a setback/buffer of twenty (20) feet from the Ordinary High Water Mark (OHWM) or the upland edge of the floodway, whichever is greater. A few residential parcels are regulated by the City's shoreline program.

The shoreline regulations issued by the Department of Ecology in 2003 require that the regulations protecting the shoreline be at least as stringent as the regulations contained in a jurisdiction's Sensitive Areas Ordinance (SAO). Tukwila's SAO establishes a buffer width of 100 feet for properties that abut a stream with salmon. Under the SAO, a property owner may request a buffer reduction of up to 50% if mitigation is provided. The mitigation provided can be such actions as removal of invasive vegetation in the remaining buffer area and planting of native vegetation to enhance the buffer.

Functions of Watercourse Buffers

Included as an attachment to this memo is a copy of the report prepared by Adolfson Associates in June, 2003, on the Best Available Science for Watercourses, prepared during the update of the City's sensitive areas ordinance. The report identifies four key elements necessary for healthy salmonid populations:

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1. Maintaining stream baseflows;
2. Maintaining water quality;
3. Providing in-stream structural diversity; and
4. Providing biotic input of insects and organic matter.

Each of these elements is discussed in more detail below – the information is taken directly from the BAS report (i.e. the information is either direct quotes or paraphrased).

1. Maintaining stream baseflows

Urbanization, particularly the amount of impervious surface in a stream basin, changes the volume, rate and timing of water flowing through a stream system – these changes in turn impact the physical characteristics of a stream channel, which affect the quality of salmonid habitat.

2. Maintaining water quality

Salmonid fish require water that is both colder and has lower nutrient levels than many other types of fish.

- *Water Temperature*: The general range of temperatures required to support healthy salmonid populations is generally between 39 degrees and 63 degrees. Riparian vegetation, particularly forested areas can affect water temperature by providing shade to reduce exposure to the sun and regulate high ambient air temperatures.
- *Dissolved Oxygen:* dissolved oxygen is one of the most influential water quality parameters for aquatic life, including salmonid fish. The most significant factor affecting dissolved oxygen levels is water temperature – cooler streams maintain higher levels of oxygen than warmer waters.
- *Metals and pollutants:* Common pollutants found in streams, particularly in urban areas, are excessive nutrients (such as phosphorous and nitrogen), pesticides, bacteria and miscellaneous contaminants such as PCBs and heavy metals. Impervious surfaces collect and concentrate pollutants from different sources and deliver these materials to streams during storm events. The concentration of pollutants increases in direct proportion to the total amount of impervious area. Undisturbed riparian areas can retain sediment, nutrients, pesticides, pathogens and other pollutants, protecting water quality in streams. Elevated nitrogen and phosphorus levels in runoff are a typical problem in urban watersheds and can lead to increased in-stream plant growth, which results in excess decaying plant material that consumes oxygen in streams and reduces aquatic habitat quality.

3. Providing in-stream structural diversity

Several general habitat physical elements affect the health of salmonid habitat:

- *Substrate:* Substrate refers to the sediment composition (sand, gravel, etc.) of the stream bed. Under natural conditions, the redistribution of substrate through bank

erosion, and channel movement is a natural occurrence and necessary to maintain clean, sediment free gravels. In urban basins, increases in stream flow quantity and velocity can cause scouring that displaces stream substrates which in turn reduces the quality and quantity of spawning areas. Scouring results from increased runoff from impervious surface and from increases in velocities as a result of channelization (straightening) and the removal of streamside vegetation.

- *Large woody debris (LWD):* LWD refers to limbs and tree trunks that naturally fall into the stream bed. LWD serves many functions in watercourses. LWD adds roughness to stream channels, which in turn slows water velocities and traps sediments. Sources of LWD in urban settings are limited where stream corridors have been cleared of vegetation and developed and channel movement limited due to revetments and levees. Under natural conditions, the normal movement of the stream channel, undercutting of banks, wind throw, flood events are all methods of LWD recruitment to a stream channel.
- *Pool quality and quantity:* Large, deep pools with cover provided by woody debris and overhanging vegetation provide more habitat value than smaller, shallower pools. Adult salmonids require pools with sufficient depth and cover to protect them from predators during spawning migration. Adult salmon often hold to pools during daylight, moving upstream from pool to pool at night.
- *Floodplain connectivity and off-channel refugia:* Off channel wetlands and side channels in riparian areas provide foraging habitat, overwintering habitat and refuges for rearing fish.

4. Providing biotic input of insects and organic matter
Riparian areas provide foods for salmonids, such as insects falling from overhanging vegetation. Leaves and other organic matter falling into stream provide food and nutrients for many species of aquatic insects which in turn provide forage for fish.

This summarizes the key aspects of the environmental functions performed by buffers along watercourses. Appendix B of the 2003 report is a chart organized by buffer function of the width generally needed to achieve a particular buffer function. As can be seen, the buffer widths vary widely by function type from as little as 16 feet for large woody debris recruitment to over 400 feet for sediment removal. The Washington State Department of Fish and Wildlife recommends a riparian buffer width of 250 for shorelines of statewide significance (see page 8 of the 2003 report).

Analysis of Development Character of Residential Shoreline

An analysis was prepared that looked at the residential properties along the shoreline and identified the number of parcels with structures within 50 feet and 100 feet of the OHWM. This analysis showed the following:

ZONE	Number of parcels within 50 feet of OHWM	Number of vacant parcels within 50 feet	Number of parcels with structures within 50 feet/%	Number of parcels within 100 feet of OHWM	Number of vacant parcels within 100 feet	Number of parcels with structures within 100 feet/%
LDR	135	12	67/49%	201	25	165/82%

As can be seen from the chart above, almost half of the parcels in the residential neighborhoods have a structure within 50 feet of the OHWM – a direct result of the current King County regulations. To apply a buffer width that is consistent with the City's SAO of 100 feet would create a situation where 82% of the properties along the river would have nonconforming structures as they relate to the proposed shoreline buffer.

Expansion of nonconforming structures in the proposed SMP buffer would be governed by the City's zoning code, TMC 18.70.050, which permits an expansion of only 50% of the square footage of the current area that intrudes into the setback and only along the ground floor of the structure. For example, if 250 square feet of a building extended into the proposed buffer, the ground floor could be expanded a maximum of 125 feet in total area along the existing building line.

Staff considered applying a buffer of 100 feet with the potential of a property owner applying for a buffer reduction of 50%, however, under the Shoreline Management Act, this would have required an application for a shoreline variance for each requested buffer reduction, a process that requires review and approval both at the local and state level (Ecology must review and approve the variance in addition to the City of Tukwila). This did not seem a reasonable process to require of so many property owners. Since the proposed buffer is the maximum reduction that could be approved under properties affected by the SAO, the triggers for compliance with the standards of the draft SMP (identified below) serve as the way to achieve mitigation for the lower buffer width.

Summary

The purposes identified for the shoreline residential environment in the draft SMP are as follows:

- Ensure no net loss to shoreline ecological functions;
- Help protect water quality and habitat function by limiting allowed uses;
- Protect existing and new development from high river flows by ensuring sufficient setback of structures;
- Promote restoration of the natural character of the shoreline environment; and
- Allow room for reconstructing over-steepened river banks to achieve a more

stable slope and more natural shoreline bank conditions and avoid the need for shoreline armoring.

To achieve these purposes and avoid creating an overwhelming number of nonconforming structures in the residential areas along the shoreline, staff looked at establishing a buffer that would achieve some of the environmental purposes of a water course buffer and that would also allow room for the river bank to naturally achieve a more stable slope. A more stable slope would be achieved where the bank slope ratio is 2.5 (horizontal):1(vertical), and then measuring 20 feet from the top of where the river bank would be 2.5:1, with a minimum buffer width of 50 feet. This would ensure that no new structures are located in an area that could potentially be eroded by the river. The minimum buffer width of 50 feet would be equivalent to the maximum buffer reduction a property owner could request under the SAO.

The Department of Ecology reviewed the proposed buffer width in the residential area but did not provide written confirmation that it would be acceptable. It is likely that Ecology is waiting to see how the proposed buffer width works with other aspects of the Draft SMP (such as the development standards) that provide protection and enhancement of the buffer area before determining whether the buffer width complies with the requirements of the Shoreline Management Act.

The proposed buffer does comply with the minimum width established by the SAO for Type 2 streams if a buffer reduction with mitigation has been approved. The proposed buffer width will provide enough room to remove some pollutants and sediments and allow LWD recruitment input into the river. The area within the buffer reduces the risk to new structures from being placed in locations that could be jeopardized in the future by erosion and provides an area to perform ecological buffer functions for the river.